

FGF Studies in Small Business and Entrepreneurship

Joern H. Block · Jantje Halberstadt ·
Nils Högsdal · Andreas Kuckertz ·
Helle Neergaard *Editors*

Progress in Entrepreneurship Education and Training

New Methods, Tools, and Lessons
Learned from Practice

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FGF Studies in Small Business and Entrepreneurship

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The Future of Entrepreneurship Education and Training: Some Propositions



Joern H. Block, Jantje Halberstadt, Nils Högsdal, Andreas Kuckertz,
and Helle Neergaard

Abstract The education of future entrepreneurs shapes how we will live in the future. Entrepreneurship education is thus of utmost importance. This paper formulates several propositions and critical insights that we deem especially important for the current state of entrepreneurship education and its future development. These propositions concern the goals and target groups of entrepreneurship education as well as its contents, design, and educator role.

Keywords Entrepreneurship education · Entrepreneurship tools · Entrepreneurship training · Propositions

1 Introduction

The education of future entrepreneurs shapes how we will live in the future. Entrepreneurship education is thus of utmost importance. Entrepreneurship educators and researchers constantly renew tools, interventions, and training programs for

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entrepreneurship education and adapt them to the specific needs of entrepreneurs and developments in the entrepreneurship ecosystem.

Generally, entrepreneurship education is on a success trajectory (Kuckertz, 2021), and more and more stakeholders and learners have the opportunity to benefit from it (Kuckertz, 2013). Moreover, the ongoing digitalization and the situation of a (post-)pandemic world pose new challenges for entrepreneurship educators and facilitators (Liguori & Winkler, 2020) and create momentum for innovations in (digital) entrepreneurship teaching, training, and tools.

It is against this background that we have put together this edited volume. As entrepreneurship and entrepreneurship education are context-specific (Welter, 2011; Thomassen et al., 2020) and their conduct and impact vary a lot (Walter & Block, 2016), we made sure to include submissions from multiple institutional and cultural backgrounds. The edited volume collects these new ideas and makes them available to the community of entrepreneurship educators, facilitators, and scholars. The volume is open access, for which we are grateful to *Förderkreis Gründungs-Forschung e.V. (FGF)*, the largest academic association for entrepreneurship, innovation, and small-and-medium-sized enterprises in German-speaking countries. Collecting chapters for this volume and managing the review process has been an exciting and fruitful editorial journey, and we wish to thank all authors, reviewers, and, most importantly, Carlos Krause as managing editor for their hard work. We devote the book to Felix Meyerhoff, who passed away during his doctoral studies on entrepreneurship education. His premature and sad death was the trigger that led to the call for papers and gestation of this edited book around the future of entrepreneurship education.

Rather than summarizing all individual contributions here, we use the opportunity to reflect on our (subjective) learnings from putting together the volume. This experience has led us to formulate several propositions and critical insights that we deem especially important for the current state of entrepreneurship education and its future development. These propositions concern the goals and target groups of entrepreneurship education as well as its contents, design, and educator role.

2 The Goals and Target Groups of Entrepreneurship Education

Proposition 1: Entrepreneurship students not starting businesses after completing their education is also a good outcome of entrepreneurship education.

Research shows that entrepreneurship education can sometimes reduce students' entrepreneurial intentions (Von Graevenitz et al., 2010). Students learn what it takes to become an entrepreneur and may question whether becoming an entrepreneur fits with their personal goals and life plans and whether it is the right occupational choice for them. As a result, they develop a more realistic picture of entrepreneurship and may decide against entrepreneurship, which is an entirely acceptable outcome. Like every other form of education, the goal of entrepreneurship education is to train students to become critical thinkers. If, as a result of this critical thinking, students

decide against entrepreneurship and choose a different career path, that is a good and desirable outcome as well. In turn, those students who, after a critical reflection induced by entrepreneurship education, start their own venture should be highly motivated and persistent in tackling the challenges associated with entrepreneurship, particularly in the early phases of venture gestation. Some students may also decide to start a business later in their life after having gained valuable work experience in established firms. Entrepreneurship education empowers such students to take responsibility in established organizations by acting as intrapreneurs.

Proposition 2: Entrepreneurship education is not only for business students—it's for everyone.

Today, entrepreneurship is related to more than business models and personal wealth creation. Entrepreneurs play an increasing role in societal well-being as it requires entrepreneurial thinking and acting to solve society's urgent problems. Therefore, entrepreneurship is increasingly connected to sustainability, for example, achieving the UN's Sustainability Development Goals (SDGs). We often see people stuck in discussions concerning today's issues. What is required, however, are individuals who develop solutions and get things done: entrepreneurs. They are needed not only in business and economic settings but also in research, politics, and civil society from all kinds of disciplines. There is the necessity and potential for entrepreneurial thinking and acting, characterized by innovation, solution, and action orientation from various stakeholders—from everyone at best. What does this mean for (future) entrepreneurship education? Thinking that entrepreneurship only pertains to business-related education is an outdated perspective. Entrepreneurship educators and researchers should focus more on integrating their knowledge into additional study programs and interdisciplinary settings. While entrepreneurship-related topics are nowadays well established in business administration programs, there is still a lot of potential in other areas such as engineering, social science, and liberal arts. Entrepreneurship educators need to be aware that a perceived focus on business generation as a goal of entrepreneurship education may limit access to other disciplines, while a broader focus on the term innovation may pave the way into other departments and faculties.

Proposition 3: Entrepreneurship education has goals beyond creating high-growth ventures.

Since the turn of the century, the number of entrepreneurship courses and programs has mushroomed (Barnard et al., 2018). In the early years, entrepreneurship courses focused on providing the individual with skills for new venture startups, but today we can find a much broader range of courses focused on, e.g., innovation, design thinking, and social and environmental concerns. Not only has entrepreneurship education become much more multidisciplinary (Neergaard et al., 2020), but it has also started to focus on developing social competence, fostering employability, and providing strategies for lifelong learning (Neck & Corbett, 2018). Thus, today entrepreneurship education is much more than just a “factory” for creating high-growth new ventures.

Proposition 4: Entrepreneurship education should start early and never stop.

Studies show that the foundation for an entrepreneurial attitude can be built in early childhood (Krieger et al., 2022a, 2022b). Therefore, it needs increasing interest in

didactical approaches, methods, and tools that can be used in entrepreneurship education at schools and even in preschool and kindergarten that transcend student company concepts (Mauer et al., 2017). In addition, there is no reason to stop entrepreneurship education after university studies are completed. Along with arguments for life-long learning, there is a need to develop, broaden, and strengthen the competencies that achieve entrepreneurial spirit and action at all ages and positions. This is why we call for more attention to entrepreneurship education offerings as continuing training that can also be designed to target professional development within existing companies and other organizations, capturing it as intrapreneurship education.

Proposition 5: Entrepreneurship education should celebrate diversity.

Entrepreneurship education should celebrate diversity, addressing different stakeholder groups with various approaches. One of the challenges receiving increasing attention is how to address women in entrepreneurship education appropriately. We still see an insufficient number of women entrepreneurs, which seems to be driven by differences in attitudes toward entrepreneurship (Steinmetz et al., 2021) and differences in perceptions of entrepreneurial skills (Abbasianchavari & Block, 2022). Research further suggests that women are, to a lesser degree, motivated by potential financial success than their male counterparts (Carter et al., 2003). At the same time, women are more motivated than their male counterparts when it comes to solving a problem and a considerable minority sees entrepreneurship as a way to engage for society (Schneider et al., 2021). Entrepreneurship education could, on the one hand, specifically focus on women and their (probably) different needs. On the other hand, approaches focusing specifically on women could lead to the unintended effects of positioning women as needy or unentrepreneurial and even falsely seeing women as one homogeneous group. However, instead of developing entrepreneurship education approaches tailored to stereotypical expectations, a broader perspective needs to be applied, appreciating diversity and discussing the effects that different groups offer. Embracing the different motives and individual paths to entrepreneurship may open up further target groups beyond business administration students. The possibility to realize one's own idea resonates with almost 80% of all students, and more than 20% see entrepreneurship as a way to change the world (Schneider et al., 2021). This situation makes it even more important to focus on the diversity competencies of future entrepreneurs and entrepreneurship educators.

3 The Content and Design of Entrepreneurship Education

Proposition 6: Different target groups of entrepreneurship education require different skills and competencies.

Different target groups of entrepreneurship education require different sets of entrepreneurial competencies. As seen with EntreComp, the Entrepreneurship Competence Framework developed by the European Commission (Bacigalupo et al., 2016), entrepreneurial competencies consist of various skills constituting the building blocks of entrepreneurship in various combinations—with selected areas being

more relevant for certain entrepreneurial activities. Research and practice should also increasingly focus on combining entrepreneurship and sustainability competencies toward broader frameworks as a basis for modern integrative entrepreneurship education aimed at creating impact.

Proposition 7: Entrepreneurship educators should also teach about the destructive side of entrepreneurship.

Entrepreneurship creates economic value for society. This positive outcome stems particularly from innovative and fast-growing new ventures (Block et al., 2017). However, these ventures have the most considerable potential for destructive effects producing environmental harm, societal inequality, and other undesirable outcomes of entrepreneurial action (Kwon & Sorenson, 2021). Therefore, entrepreneurship educators should not only teach about the positive impact of entrepreneurship but also reflect on its harmful and destructive aspects (Bandera et al., 2021). The goal is to educate entrepreneurs who reflect on their behavior and what it means for the stakeholders and society of their venture. As a result, the outcome of entrepreneurship education would be better, more sustainable startups that help to solve the grand challenges our society faces today.

Proposition 8: Entrepreneurship education requires existential, experiential, and transformational learning approaches.

New venture creation educators also tend to draw on experiential and transformational learning. However, given the change in focus, we need to get beyond these learning models and start looking at what the students bring with them when they enter the classroom. We have to understand that not all students are born entrepreneurs and that an enterprising mindset needs to be taught in a completely different way. Students are often unaware of what it takes to become entrepreneurs and do not realize they possess many necessary characteristics and qualities. Thus, we need to start focusing on the existential dimension of entrepreneurship. In order to do so, we need to introduce existential learning as a precursor to experiential and transformational learning. Existential learning deals with how we as learners relate to the world and positions the learner as a free and responsible agent, able to determine their own development. It focuses on how past choices have influenced us and how we perceive the possibilities and opportunities we meet in life (Neergaard & Robinson, 2020). The existential approach to learning helps learners grow at their own pace and enhances and refines their existing knowledge base. It supports and extends individual agency through significant learning experiences and critical self-reflection.

Proposition 9: Entrepreneurship tools are important, but their effects depend on the students' experience, education, personal qualities, and the contextual environment.¹

A great deal of entrepreneurship education teaches students how to use entrepreneurship tools to identify and exploit entrepreneurial opportunities and build

¹This idea was developed together with Felix Meyerhoff, who passed away during his doctoral studies. His dissertation was built around the goal to test these ideas in a rigorous experimental setting.

permanently successful ventures. Such tools are, for example, the omnipresent lean startup or the value proposition design. These tools can guide the entrepreneurial process and lead to more structured thinking about entrepreneurial opportunities and challenges. The old saying “a fool with a tool is still a fool” holds true. Thus, it is not just the tool but the underlying process that students need to learn and practice. One must be cautious when using such tools as they may produce undesirable side effects and even constrain creative thinking when misapplied and in the wrong contextual environment. In addition, their effects may depend on the students’ prior education and experience as well as their personality and even scientific rigor. A value proposition canvas can be just a number of formulated assumptions or the results of weeks for validating or falsifying the underlying hypotheses.

Proposition 10: Entrepreneurship education needs to be evidence-based, not driven by fads.

Being an entrepreneurship educator is an exciting profession—not only are we confronted with the latest ideas for changing the world by our students. Also, new tools and approaches appear every other day, and it is tempting to introduce them in the classroom immediately. Unfortunately, many of these tools and interventions are conceptualized without any objective evidence to ground them. This is a potentially dangerous pitfall—many of us are running the risk of confronting students with interventions whose effects are unclear at best but that feel somehow fancy, startup-like, and innovative. Research on entrepreneurship education has seen laudable attempts in recent years to create an evidence-based fundament for these tools and interventions. However, educators conceptualizing and revising their courses must be aware of this research to provide their students with the best possible input. This edited volume is hopefully a step in the right direction that will allow just doing that.

4 The Role of the Educator

The final proposition concerns the role of the entrepreneurship educator. Ultimately, it is the teacher who matters. Ineffective teachers achieve poor results. No fancy tool, (digital) script, or course design can replace a skillful, motivated, and competent entrepreneurship educator inspiring their students to learn about entrepreneurship as a career choice and developing the skills needed to solve today’s grand challenges.

Proposition 11: Entrepreneurship educators and practitioners should be entrepreneurial themselves.

Entrepreneurship education researchers and practitioners should also think and act entrepreneurially and see the challenges of entrepreneurship education as opportunities to develop, implement, and test innovative teaching. Calling for such educators does not mean that entrepreneurship educators must start businesses themselves to act entrepreneurially. Nor does it say that any innovative idea deserves to be celebrated because it is new and fancy. However, to be a good teacher, entrepreneurial entrepreneurship educators should always question their goals, carefully consider the needs of their specific target group(s), and constantly develop

themselves. This requires to often go beyond classical teaching and focus more on the facilitation of learning processes. This demands the right kind of accompanying research to evaluate and develop the best didactic approaches, tools, and methods to achieve a vibrant and successful entrepreneurship education.

5 Conclusion

With these 11 propositions introducing the edited open access volume on “New Developments in Entrepreneurship Education, Training, and Tools,” we hope to contribute to an entrepreneurship education that brings its students into the position to solve the grand challenges of our society proactively either as an entrepreneur, intrapreneur, or simply as an entrepreneurial-minded citizen. We wish the readers of the volume a great learning experience and hope to contribute to an effective and impactful future entrepreneurship education where and whenever it is needed.

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Part I

**Effects and Impact of Entrepreneurship
Education**

Shaping Great Transformations in Germany: The Role of Youth Entrepreneurship Education (YEE)



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Abstract Climate change, the destruction of the environment, and resource scarcity—the developments associated with these phenomena are posing ever greater challenges for humanity today and require solutions, both in a regional context and at a global level. The sustainability debate has long dominated everyday politics in Germany and elsewhere. The need for comprehensive changes in attitudes, behavior, and rules is acknowledged, and people are—in principle—aware of the great challenges that lie ahead. Yet progress is very slow in setting the necessary course for the future, and, in the light of looming ecological tipping points, this can seem quite alarming. This paper addresses the question of how to generate significantly more implementation potential in our society and bring together what are often uncoordinated developments to achieve a truly “great transformation” toward more sustainable structures in business, society, and the environment. The focus is put on the significance of innovation and entrepreneurial thinking and acting and its early, systematic manifestations. It is argued why appropriately designed, youth entrepreneurship education (YEE) could be an important factor in this context.

Keywords Great Transformations · Sustainability Transformation · Entrepreneurship Education · Entrepreneurial mindset · innovation

1 Introduction

The term and the underlying concept of the transformation of the society framework have dominated political discourse in Germany for some time. The reasons for this are, above all, the destruction of the environment visible in many places, the rampant waste of resources, and accelerating climate change with complex consequences for people's coexistence, their future prospects, and their safety (Radtke, 2021;

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Wiedmann et al., 2020). As the recent German parliamentary election campaign in 2021 showed, transformation debates touch almost all areas of society. These debates revolve around the relationship between economics and ecology, the role of digitization, new approaches to a more environmentally conscious lifestyle, responsibility for the future, intergenerational justice, social inclusion, and more (Lang-Wojtasik, 2019; Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (WBGU), 2019; Sturn & Klüh, 2021; Kanning, 2022). “Sustainability”—an umbrella term covering many of these aspects—has long become a central concept of our time (Adloff & Neckel, 2019).

Yet, the challenges and questions outlined are by no means new. Back in 1972, the Club of Rome already predicted dangerous developments as a result of misguided patterns of production and consumption as well as exponential population growth in certain parts of the planet in its study “The Limits to Growth” (Meadows et al., 1972; Schneidewind, 2018). The years that followed saw a gradually increasing engagement with environmental issues at a national level, which was also reflected in political action, for example, in the establishment of the Federal Ministry for the Environment in 1986. In the following years, individual ecological topics continued to feature on the agenda in politics, business, and society (Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB), 2016; Kahnenborn et al., 2019; Radtke, 2021). However, the major interdisciplinary discourse we can observe today is a recent phenomenon.

In light of the growing pace of fundamental ecological and economic developments and challenges for society as a whole, calls for a much more resolute and accelerated approach to sustainability transformation are becoming increasingly loud in Germany (Deutsche Energie-Agentur GmbH (dena), 2021; Scientist for Future, 2019; Stiftung 2°—Deutsche Unternehmer für Klimaschutz, 2021). It is argued that especially against the backdrop of ever-more evident climate change and resulting environmental damage, it is no longer enough to simply react to changing circumstances once they have occurred. Instead, a completely new agenda was needed, or else society would inevitably reach and pass certain tipping points, after which certain ecological and social processes would lead to disaster scenarios that could not be avoided or reversed (Kopatz, 2021; Rat für nachhaltige Entwicklung & Deutsche Akademie für Naturforscher Leopoldina, 2021). Accordingly, change should ultimately be actively designed (“change by design”) and not the result of the externally forced change (“change by disaster”) (Sommer & Welzer, 2017; Luks, 2019).

As vociferous—and frequently quite justified—as these demands from an increasing number of groups in society are, at the same time critics point out that up to now, action has been sluggish and measures have not been very sustainable (Dylllick & Muff, 2016; Müller-Christ, 2017; Vermeir & Verbeke, 2006). Blühdorn, for instance, argues that even if the urgency of a social and ecological transformation to sustainability has long been recognized by almost all sides, modern societies are more determined than ever to defend their prosperity and lifestyle (Blühdorn, 2020a). As a first summary, it can therefore be stated: On the one hand, society as a whole in Germany and Europe considers climate and environmental protection as a

vital topic for the present and future (European Commission, 2020; Umweltbundesamt, 2021); on the other hand, there are serious weaknesses in the implementation of the transformation processes proposed (Blühdorn et al., 2019). This implementation deficit is evident in a number of areas, whether in politics, business, society, or at the individual level. This raises the question of how the willingness to change that apparently exists within society can be transformed more sustainably and effectively into the ability and action to take the necessary steps toward that change both at the individual and societal level.

Opportunities to systematically bridge this gap between intention on one side and behavior on the other and thus drive intended processes of change (“change by design”) more quickly and actively than to date can be found in early entrepreneurship education starting in school. Because ultimately reflection on the need for change, the development of possible solutions, and their targeted implementation, as well as change in general (Schumpeter, 1997), are central elements of entrepreneurship in the broadest sense. Entrepreneurship is characterized by the development and implementation of new (technological) innovations. At the same time, entrepreneurial thinking and acting are central to quickly strike out in new directions or to adapt chosen paths appropriately. This also means that new ideas and their proactive realization in business and society can be key factors in turning ecological challenges into socioeconomic opportunities. Youth Entrepreneurship Education can thus (this is the central hypothesis) be an early starting point to impart such competencies to the upcoming generation systematically.

This paper therefore goes on to explore the possible role of Youth Entrepreneurship Education (YEE) in actively shaping great transformations—like the sustainability transformation—that are important for the future in Germany. To that end, Sect. 2 first outlines the characteristics and challenges that great transformations involve by definition. Based on this, the subsequent section reflects on the meaning of entrepreneurship against the backdrop of the current economic and societal parameters and needs. Section 4 then draws on that reflection to explore the significance of YEE when dealing with transformational challenges. The fifth section concludes this paper with a short, reflective summary and an outlook.

2 The Nature of Great Transformations

The basis for a systematic analysis of the role of youth entrepreneurship education in shaping great transformations—as in the field of sustainability—is first to take a closer look at the nature of such transformations. With the focus on the (educational) goal of being able to recognize the need for transformational processes earlier and to shape them more actively, a brief discussion of what the basic characteristics and implications of great transformations are is first required. Etymologically, the word *transformation* comes from the Latin verb *transformare* (= to convert, reshape, transmute, change). The term transformation thus refers to a process of reshaping, to change itself, or to the result of such a change process (Berlin-Brandenburgischen

Akademie der Wissenschaften, 2021; Reißig, 2009). Partly because of its use as a technical term in various academic disciplines, such as mathematics, biology, linguistics, pedagogy, and social sciences (Kollmorgen et al., 2015), “transformation” has become an established term in both daily use and theory to refer to fundamental processes of change. If change has a particular direction—observable through shifts in certain variables—Günter Hesse refers to it as development (Hesse, 1987). Following this definition, transformation can be regarded as a special form of change and development (Luks, 2019).

Overall, we can now observe a general understanding of the term transformation that relates to the extent and dynamics of the changes in question on the one hand and to the sociopolitical will to actively shape them on the other. Recent works in the fields of economics and social sciences make references to Karl Polanyi and his work “The Great Transformation” (1944) (Blühdorn, 2020b; Luks, 2019; Schneidewind, 2018; Wissenschaftlicher Beirat der Bundesregierung Globale Umweltveränderungen (WBGU), 2011). At the heart of particularly extensive and complex transformations (Kollmorgen et al., 2015) is the reversal of traditional circumstances and structures, which Polanyi identified when observing the change in social and economic order in the nineteenth century (Henseler, 2010; Polanyi, 2001). In universal and abstract terms, “great transformations” are characterized by a very intense and dynamic development (understood as directed change) that is initiated and driven by a combination of factors that interact with each other. The associated profound change processes at a structural and functional level tend to relate to a wide variety of aspects of life, which are considered to be relevant in the course of the transformation in question (Kollmorgen et al., 2015; Reißig, 2009, 2014).

Braukmann et al., who focused on the digital and sustainability transformation in their reconstructive and systematizing review of great transformations, identified the following four basic characteristics of great (societal) transformations (Braukmann et al., 2022). These make it clear that transformations cannot be shaped by a few individual political or economic measures and by experts alone. Rather, the challenges facing society as a whole, which affect every individual, become evident:

- Persistence: As a result of their durability, great transformations lead to comprehensive, fundamental structural changes in numerous aspects of socioeconomic life in the medium and long run.
- Multidimensionality/complexity: Great transformations do not relate to a single target group or a specific sector but rather to numerous areas of business, politics, work, and life. This results in various interdependencies and a degree of complexity in the desire for and in interactions with these developments. Such interdependencies and complexity can be reinforced by inhibitory or dynamizing interactions within and between transformations (such as between digitization and sustainability).
- Mightiness/unavoidability: Transformation processes and their implications can be disregarded briefly or in the short term. In the medium and long term, societies cannot escape them.

- Ubiquity/globality: Great transformations, like those in the context of sustainability or digitization, are not limited to specific geographic areas but are in principle important everywhere; i.e., they are of global significance like, for example, the multilateral negotiations at the Glasgow Climate Conference in 2021 illustrate.

As these four core characteristics indicate, societal transformation processes involve challenges in many different areas of life for every single person. If there is also an increasing pressure to change, deep structural changes in society as a whole become inevitable eventually. Thus, in order to avoid a situation, in which the majority of those affected feel they are being “dragged along” without having any choice or say, but to rather create an environment, which offers people the chance to help shaping developments instead, there is a need to involve all parties and engage with the phenomena outlined as early as possible. Breaking new ground, developing new solutions, and realizing new ideas can therefore not only make a fundamental contribution for shaping transformations. Rather, it is also important that as many people as possible in the economy and society contribute their share.

When doing so, the peculiarities of long-term, large-scale development processes and the accompanying “visions of transformation” must be made transparent for all in society (Kristof, 2020). It is in the nature of things that great transformation goals for the distant future must remain relatively abstract, as discussions at the aforementioned climate conference in Glasgow demonstrated. For example, even though the exact national costs and possible global effects of transformation processes launched later or too late can be modeled, it is very difficult to make them palpable and tangible. It is not surprising that future impacts and interdependencies of past and present actions are therefore difficult to transfer into the minds and understanding of the general public. Hence, these future impacts and interdependencies do not have enough impact on people’s action soon enough or even at all. Such effects are also amplified by the fact that people affected by great transformations—unlike in Homo oeconomicus modeling—do not seem to act completely rationally (Brunner, 2019). This is, for instance, confirmed by studies on the so-called intention-behavior gap (Kollmuss & Agyeman, 2002; Sheeran & Webb, 2016; Rausch & Kopplin, 2021). These studies show, for example, with reference to food consumption, that the rationally desired and prescribed action does not correspond to the everyday action (Meyer & Simons, 2021). Even though there is support for more abstract transformation goals, such as more sustainability in Germany in principle, issues of daily politics, operational targets in business, and individual problems in civil society push such objectives into the background on a regular basis. Thus, they often have little impact in terms of driving practical action (Luks, 2019; Reißig, 2011).

Yet, as great transformations, by definition, have an impact on all of society in the long run, each individual will be affected by them—positively or negatively. In a free and democratic economic and social system like it can be found in Germany, every person must therefore have the opportunity to face and deal with great transformation issues, given that the aim is to enable enlightened, autonomous involvement in shaping a new future rather than heteronomy. Against this

background, it is important to think even more systematically about how future citizens can be prepared for these challenges and supported in their development process. Youth entrepreneurship education can play here a significant role possibly. This is not only evident with regard to the challenges of great transformations outlined above. This is also shown below by a look at the characteristics and meaning of entrepreneurship and innovation in the context of societal demands and needs.

Overall, this short discussion of the nature of great transformations underlines the complexity and inescapable power that characterizes them. Great transformations are always accompanied by reactions on various levels of a sociotechnological system. The goal of methodical, effective, and early involvement comes with immense challenges, which are amplified by the many global interdependencies. This is illustrated by the genesis of and status quo in dealing with the sustainability transformation in Germany, Europe, and the world.

3 Entrepreneurship and Innovation in the Context of Current Societal, Environmental, and Economic Needs and Conditions in Germany

Moving from a general examination of great transformations and their characteristics to the sustainability transformation that is currently the focus of public debate, that transformation process can also be placed in a broader historical context. Like other regions of the world, Germany has repeatedly experienced comprehensive economic and social upheaval over the years. True to the *topos* that change is the only constant in socioeconomic systems, economic and ecological circumstances as well as needs and values are in a constant state of change. The only thing that varies is the absolute and relative speed of that change. Consolidation and realignment marking historical milestones have happened repeatedly and continue to happen. A good example is the various phases of industrialization and globalization, which led to massive changes in production and consumption, new demands on employees, and many other socioeconomic implications in Germany and other countries. In our post-industrial system of competition economics today, dealing with challenges and problems and developing potential solutions is no longer just a task for specialists but rather increasingly becomes a task for everyone who plays a part in businesses and society (Koch et al., 2021).

Such tasks and desiderata for action in politics, business, and society become particularly clear within the context of the sustainability transformation. Production processes currently commonly used in industry, business models (Dylllick & Muff, 2016), and traditional patterns of consumption and consumer behavior (Vermeir & Verbeke, 2006) are increasingly criticized in public discourse due to the finiteness of natural resources. Rising CO₂ emissions caused by this type of human behavior and the resulting changes in the global climate are becoming more and more visible and

tangible, for example, through natural disasters. All of this is leading to increasing societal pressure to take up a position on the matter and act, as well as to a vigorous discussion about the need for engagement. The most pressing question here is how the emerging ecological, economic, and social needs can be met in a holistic, coordinated manner if goals like economic prosperity and intergenerational social justice are to continue to be crucial factors in political decision-making.

Looking at the categories of innovation and entrepreneurship can be useful when trying to answer this question for a variety of reasons. This can be seen from the history of both economics and technology: Technological developments and innovations and their establishment on the market enable previous less sustainable—for example, emissions-intensive—technologies or even business segments to be replaced by more efficient, greener technologies and value-added processes. Following Schumpeter (1928, 1997), it is broadly accepted that innovations can further develop existing technologies and products or “creatively destroy” [original German: “schöpferisch zerstören”] them with new technologies and products. Innovations and entrepreneurship, understood as the personal dimension of change, are thus significant driving forces in socioeconomic development.

With regard to the sustainability context, this can be demonstrated using, for example, the Multi-Level Perspective (MLP) model, which was conceptualized by Geels et al. as a contribution to international transition research (Geels & Schot, 2010; Kemp et al., 2007; Loorbach, 2010). The MLP model systematically describes and analyzes patterns of transformation and change dynamics (Schneidewind & Scheck, 2012). In this model, “niche innovations” in particular have significant potential to lead to fundamental new developments. The system innovations that can emerge from the niches (Geels, 2004) hold the transformative capacity (Dolata, 2009), effectiveness, and dynamics to break apart stable structures in a sociotechnical regime and to help shape future new stable structures (as shown in Fig. 1).

Yet, the ability of innovations and entrepreneurship to be a key factor in the active shaping of great transformation processes is not restricted to this conventional technology and market economy logic, i.e., through new products, services, and business models. In fact, entrepreneurial thinking and acting in the broader sense have an even bigger potential. Ultimately, sustainability transformation is all about breaking away from traditional patterns of behavior that inhibit transformation. In order for this to succeed, social innovations have to be realized. Social innovations may, for example, manifest themselves in new ways of thinking and behaving in civil society or politics and are thus complementary to the conventional innovation mechanisms of the market economy (Kopatz, 2021; Christanell et al., 2019). Characteristics such as the willingness to take entirely new directions in thought and action, to create innovative structures, and to adapt one’s own actions in line with the relevant objectives are therefore of systemic relevance if transformation is to be active and not just reactive. Such characteristics enable political actors, society as a whole, and ultimately each individual to initiate and drive the right changes toward the stated objectives through creativity and innovation (Kahlenborn et al., 2019).

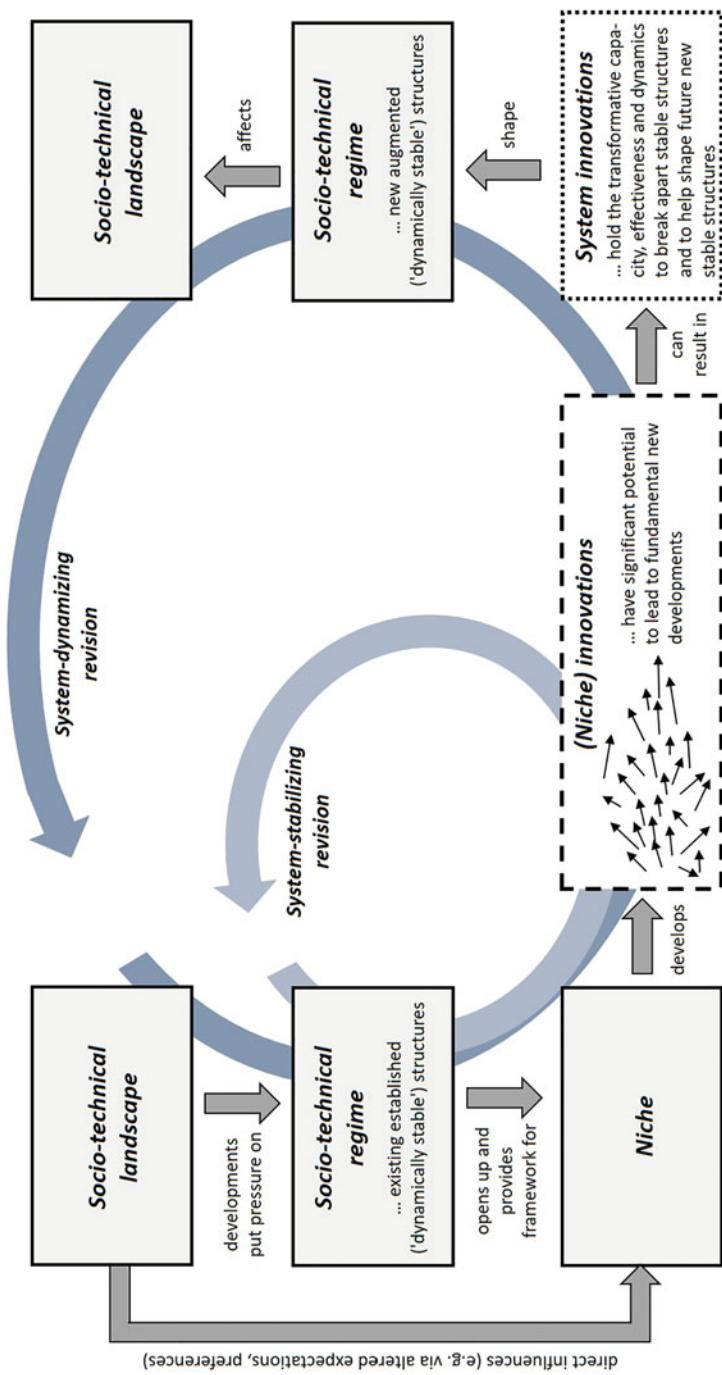


Fig. 1 The role of innovations in the multi-level perspective [own illustration based on Geels and Schot (2010, p. 25)]

Entrepreneurial thinking and acting as a general mindset can consequently play a substantial role in dealing with or shaping the sustainability transformation. This is also plausible from a system theory perspective (Diesner, 2015; Ropohl, 2002). As it has been shown in chapter “The Nature of Great Transformations”, great transformations are characterized by a certain ubiquity, which is why in the medium to long term each individual will find themselves confronted with transformation-related issues and maybe even with a need for change due to these transformations. Accordingly, the sustainability transformation cannot be realized only by a few parts of society or by selected groups of experts. The more prevalent entrepreneurial thinking and acting in the abovementioned sense is in a society, the better equipped individual people and systems will be when facing those challenges. In the context of sustainability, Koch, Braukmann, and Bartsch argue along the same lines that the better the young people are prepared for this modern experiential world of change as a constant, the more confident and more independent they will be in meeting challenges (Koch et al., 2021). These various individual processes of change can merge into a bigger picture over time. Ideally, (individual) activities and (individual) measures in politics, business, and society would then no longer be disconnected but can instead synergistically contribute to the realization of larger sustainability goals. This way, if entrepreneurial thinking and acting become more prevalent across society, they could increase the transformation dynamics and therefore help to reach sustainability goals in a more rational and hereby faster way.

Intra- and entrepreneurs would then serve as the promoters of free, democratic social and economic systems more than ever before. They would become decisive drivers in shaping great transformations. An immense reservoir of ideas and innovations offered by society for achieving the transformation goals could translate directly into significantly fewer restrictions (in the sense of imperatives and prohibitions) than some actors in politics envision up to this point in time. Nevertheless, it is important to have a functioning regulatory corridor that is aligned with the fundamental goal of transformation. This conglomerate of rules, laws, and regulations must be suitable to regulate the various forces in a market economy and set extrinsic incentives in such a way that they promote intrinsic motivation to achieve overarching goals (climate protection, resource equity, etc.) (Kopatz, 2021). Such an approach is in line with the enlightened humanism that has historically evolved and is constitutionally established in Germany. At its core, the goal of this approach is to strengthen individual sovereignty when dealing with future societal needs so that upcoming challenges can be met in a creative and effective way in accordance with a corresponding political framework.

But how can this be achieved? How can the potential, offered by innovation and entrepreneurship and by entrepreneurial thinking and acting in both the narrower and broader sense, be utilized for shaping the sustainability transformation in Germany in a better manner than is currently the case? These questions will be addressed in the following sections as they explore the potential of YEE when implemented early in youth development.

4 On the Potential and Relevance of Youth Entrepreneurship Education in Dealing with Great Transformations in Germany

As was already discussed, great transformations like the sustainability transformation are characterized by persistence, complexity, powerfulness, and ubiquity. This poses various challenges in how society deals with transformations of this kind. Straightforward and rapidly implementable individual political or economic measures are thus not enough if individuals and society are to engage with and shape the sustainability transformation (“change by design”). Instead, it is necessary to think in terms of the bigger picture and indeed also to be willing and able to implement far-reaching changes. Characteristics of entrepreneurial thinking and acting can be valuable here, which is why this section reflects on the early imparting of the abovementioned abilities and skills through YEE.

In general terms, YEE is understood as the education and upbringing of children and young people with regard to the field of entrepreneurship. Although elements of education and learning processes in the family and extracurricular contexts can be subsumed under the term (Bartsch, 2019), YEE predominantly manifests itself in systematic, intentional teaching and learning in schools of general education and vocational (business) schools in Germany and elsewhere (Braukmann et al., 2021). The learning content, the intention, and learning outcomes as well as the way in which YEE is integrated into the school system can vary significantly depending on the design of YEE in question (Bartsch, 2019; Koch et al., 2021), as can be seen in the overview in Fig. 2. While Educating for Entrepreneurship intends to prepare for an entrepreneurial activity in the sense of a direct start-up qualification, an Educating about Entrepreneurship has the goal to convey theories and characteristics about the entrepreneur, typical fields of action, and the entrepreneurial role in economy and society (Koch, 2003; Lackeus, 2015). Educating through Entrepreneurship is a third approach in which general and entrepreneurial (key-) competencies (Brüne & Lutz, 2020) can be developed by going through and overcoming entrepreneurial processes—often via business games or business plan competitions (Lackeus, 2015).

In order to be able to analyze the relevance and significance of YEE in the context of great transformations below, a differentiated examination of the various concepts of YEE is required. One area that offers considerable potential for actively shaping transformation is the concept of educating through entrepreneurship, which understands entrepreneurship first and foremost as entrepreneurial thinking and acting and is therefore a problem-centered and solution-oriented methodological principle. A number of different arguments with reference to the legitimacy, effectiveness, and efficiency of YEE can be presented to support this claim.

First, this type of YEE can in fact be closely connected to traditional educational goals in German schools. These are, building on a neo-humanist concept of education, guided by the intention to support each individual in their personal development and thereby enabling them to make independent, responsible, mature, and emancipated decisions (Barz, 2010; Konrad, 2010). Educating through

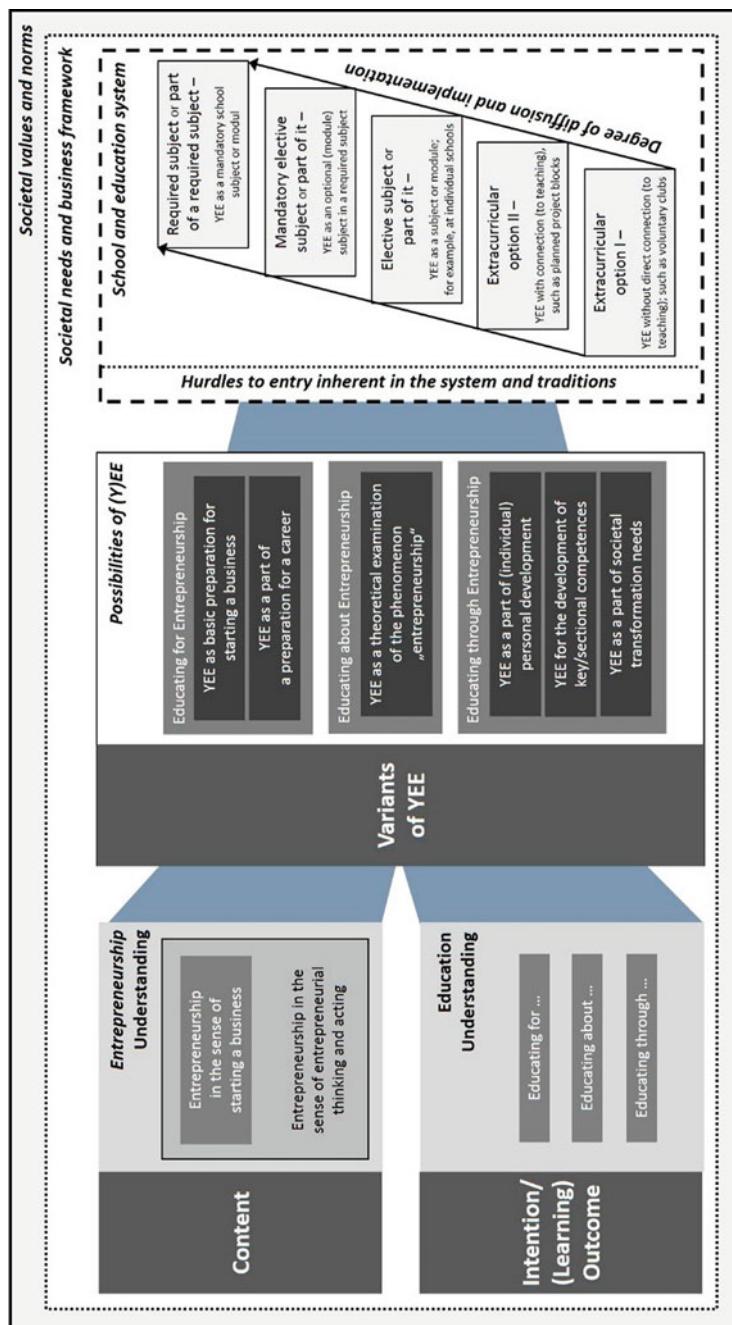


Fig. 2 Differentiation and classification of different variants of (youth) entrepreneurship education in a socioeconomic context [taken from Koch et al. (2021, p. 52)]

entrepreneurship, which places special emphasis on the (education) subject (Koch et al., 2021), can play a role here in particular because it is concerned with teaching learners basic skills related to substantial ways of thinking, acting, and problem-solving in line with formal educational theory (Jank & Meyer, 2018). Students are systematically equipped with abilities and skills that are not solely and primarily useful in a conventional entrepreneurial context, i.e., within the framework of specific, future entrepreneurial activity. Those abilities and skills can also be important when dealing with complex, everyday problem situations like those we are currently facing with regard to climate, the environment, and the use of resources.

This also applies to entrepreneurial personality traits, such as the locus of control, which describes the extent to which situations and results are perceived as controllable or influenceable (Fallgatter, 2002; Neyer & Asendorpf, 2018); or resilience, which refers to the ability to deal with stress factors and adverse situations (Neyer & Asendorpf, 2018). A high internal locus of control and pronounced resilience are traits that are important not only for conventional entrepreneurs operating in the commercial sphere. They can also be just as important in mastering everyday challenges at or outside of work, as well as when dealing with potential setbacks and delays in the initiation and implementation of measures as part of the sustainability transformation.

In a YEE design like the one proposed here, general educational goals and necessary societal transformations therefore go hand in hand. Skills such as the ability to recognize problems and a need for change, the autonomous development of solutions, the mature assessment of what action is required to achieve a goal, and finally yet importantly the ability to independently and actively contribute to shaping overarching societal changes can be supported by systematic and intentional YEE. In other words, a YEE based on Klafki's categorial understanding of education (Klafki, 2007) could be a key element in shaping the processes of the sustainability transformation. In Klafki's categorial understanding of education, education arises from a constant reciprocal exchange between the individual and the world (Klafki, 1967). In this educational theory, subject (human) and object (world) are mutually related (Klafki, 1971, 2007). Transferred to Youth Entrepreneurship Education, this means: The crucial point here is that entrepreneurship education not only helps the individual be better prepared for the world but also the world to be better prepared for the future. The abovementioned skills and abilities taught in YEE ultimately help to make structures, aspects, and challenges of natural, cultural, societal, and political reality visible to the individual (Klafki, 1971, 2007). Knowledge of these characteristics and parameters in general, but also of the problems and challenges posed by the sustainability transformation in particular, can then in turn provide a basis for future action within the framework of great transformations. YEE thus has the potential to lead to fundamental and categorially educational insights and findings about individual action.

Against this background, YEE offers major opportunities to reduce or, in the longer term, even close the intention-behavior gaps, which can frequently be identified in the context of the sustainability transformation (see chapter "The Nature of Great Transformations"). After all, a YEE does not only address taking notice and

intending to tackle challenges or important issues. It also aims at establishing an educational framework for future abilities and actions. Unlike in the concept of education for entrepreneurship, which aims to prepare students for the process of starting a business, the focus is not on a direct qualification in one single, distinct field or for a specific entrepreneurial start-up project. It rather is on personality development and on systematic preparation for future challenges and situations.

Entrepreneurial thinking and acting, or else an entrepreneurial personality, become evident in the ability to tackle challenges and problems proactively, appropriately, and on one's own initiative. Actively shaping and implementing the new in particular is, according to Schumpeter, a central characteristic that distinguishes the entrepreneur from a conventional businessperson [original German: "Wirt"] and capitalist (Schumpeter, 1997). Entrepreneurs are attributed the ability to recognize the need for change at an early stage and also to initiate and actively pursue changes. This ability can be applied to individual actions in the context of the sustainability transformation; for example, not simply waiting for decisions from others, such as political decision-makers, but instead independently, autonomously, and confidently finding one's own solutions to ecological, social, and economic challenges. Overall, such traits are promoting transformations and their presence and prevalence in politics, business, and (civil) society pose a useful premise for the active shaping of transformations in Germany.

Although it follows that YEE in the design outlined here does offer potential for shaping great transformations, a closer look at the status quo also clearly shows that YEE has not been a standard element of the various state-specific school and education systems in Germany so far. Entrepreneurial skills and abilities in terms of entrepreneurial thinking and acting are still not taught neither systematically nor professionally to the next generation across society. The de facto relevance of YEE in practice has been neglected (Bartsch, 2019). The reasons for this are manifold, and in Germany, they can be traced back to traditional critical and in some cases also ideological reservations about traditional commercial entrepreneurs (Koch et al., 2021). However, a look at the current and future societal needs and circumstances shows that a modern, socially responsible entrepreneurship can be a key factor in both, in terms of generalized entrepreneurial thinking and acting like outlined above and in terms of modern forms of social and sustainable entrepreneurship. The latter in particular do not solely pursue the goal of maximizing individual profit. They equally endeavor to increase benefits for society. Ecological and social issues understood as a challenge for society as a whole can thus inspire and drive action and be tackled using entrepreneurial instruments. Hence, YEE can take on greater societal significance in terms of its content (Klafki, 2007) and thereby generate both individual and societal educational benefits. Finally, such a YEE can provide a strong basis on which individuals can engage much more actively and constructively with current and future societal challenges. Future discussions on education theory and policy at least draw more attention to YEE, as it is capable of making a central contribution to the development of educated, socially responsible, and proactive individuals.

5 Conclusion

This paper set out to demonstrate that a categorical-educational YEE can be a central element in modern, free, and democratic societies in the medium and long run. With YEE, crucial skills, abilities, and traits that are necessary for autonomous, intrinsic, creative, and innovative participation in periods of increased societal change toward overarching goals can be developed and honed. These skills and traits include the ability to develop and effectively implement solutions and the individual perception and accurate anticipation of future societal needs. YEE can become a key factor in helping the members of our society to become more independent, responsible, proactive, and aware of problems and thus be able to shape our future. Due to its nature, YEE can contribute not only to the desire but also to the ability of every individual to act. Ultimately, it can thus reduce the intention-behavior gap that is particularly striking in the context of the sustainability debate.

All this will continue to play an important role in our society in the future, also because the sustainability transformation is characterized by persistence, complexity, powerfulness, and ubiquity. On the one hand, every individual will be affected by a need for change in the medium to long run and cannot escape the ecological, social, and economic transformation processes. On the other hand, changes in the climate, the environment, and the availability of resources cannot be counteracted by isolated ad-hoc measures by individual ministries or interest groups alone. If natural resources are to be preserved, economic prosperity is to be secured, and social justice is to be aspired, early, comprehensive, and lasting engagement by all members of society is needed. This requires social innovations just as much as traditional entrepreneurial and technological innovations. In accordance with an enlightened humanist view, individuals must be helped and encouraged early on to reflect independently upon the new and highly complex sustainability paradigm and to become a part of the value-based proactive whole.

A YEE focused on the promotion of entrepreneurial thinking and acting must therefore be capable of creating a strong foundation for the active shaping of great transformations both systematically and at an early stage. YEE can be of particular transformational relevance in our society if it supports the development of the enlightened and sovereign personality for valued-adding intersections and synergies will then emerge between transformation competence and traditional educational goals in the school and education system.

Despite all that is discussed above, it must be noted that a YEE as it is proposed here has so far not had a prominent role in educational practice. This is in part because the civil society and education and school system perspective was not given such weight in defining the need for YEE in the past. Nevertheless, as it has been shown, the YEE described here has the potential to holistically support personal development and in doing so meet societal needs and challenges in a system-inherent way. The exploration of YEE presented here may therefore also lead to further discussions about a different, more modern understanding of education in the sense of “Humboldt 2.0.” This discussion is a prerequisite for transferring the theoretical

opportunities of YEE into practice and into concrete lessons. Although there are at least some important theoretical insights into EE in schools and their entrepreneurial outcomes (Brüne & Lutz, 2020) and already many successful YEE projects in Germany (Bartsch, 2019; Ivanova et al., 2018), the outlined potential of YEE cannot be used systematically and across the entire social spectrum yet. YEE in a form of Educating through Entrepreneurship would generally only be taught on an optional basis and for a limited period of time in the traditional school system, in which the teaching of knowledge often still dominates. If school systems aim to prepare the next generation for their role in society, they must synergistically consider both tradition and innovation in order to ensure a worldview centered on proactive involvement.

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Gender Team Diversity in Entrepreneurship Education



Christian Schultz

Abstract This study explores the impact of the student team's gender diversity on different performance outcomes in a business plan course with active teaching elements. Although the team's gender diversity is oftentimes neglected in entrepreneurship education research, the empirical analysis shows that significant performance differences depending on a gender-specific composition exist. In general, mixed-gender teams perform better than men's teams, which receive, on average, worse grades for their business plan. Additionally, mixed teams perform comparatively better in attracting interest for their business idea as measured by views on an online idea platform. To enhance group performance, practitioners shall pay more attention to team composition in an educational setting and actively promote mixed-gender teams.

Keywords Entrepreneurship education · Business plan course · Entrepreneurship pedagogy · Team · Gender diversity

1 Introduction

A considerable share of the scholarly discourse in the entrepreneurship education (EE) field is centered around the questions of whether entrepreneurship can be taught and what its effects are. Finding answers to these questions is important as it determines considerably if downstream research in EE is worth the effort. Today, substantial empirical evidence exists; e.g., the large-scale GUESS (Global University Entrepreneurial Spirit Students' Survey) study (Bergmann, 2014) shows that EE in higher education has positive impacts, especially in fostering an institution-wide entrepreneurial culture. But some skepticism about the teachability of EE remains (Rideout & Gray, 2013), which might predominantly stem from unreasonably high expectations about the direct effect of EE on start-up activity (Schultz, 2020). To

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presume that the majority or even a considerable proportion of participants will become entrepreneurs just overcharges the influence of EE. To put it bluntly, not everybody who learns to read will write a book and not everybody who writes a book will publish a bestseller or win a Nobel prize.

To measure success and quality in EE is even more difficult when we consider that the entrepreneurial process is unpredictable and entrepreneurial success depends on many external factors and the “right” mixture of resources. As a result, it remains impossible to provide narrow blueprints for entrepreneurial success through EE (Fayolle, 2008). Consequently, there are elements of entrepreneurship that are rather teachable, such as the functional skills for managing a business or the formal evaluation of opportunities, and there are unteachable parts as the ability to create opportunities (Saks & Gaglio, 2002).

Critics shall also have in mind that the mission of university-based EE is not solely to foster regional start-up activity. First, EE shall develop functional management skills and abilities among students to help them start and manage businesses (Gibb & Nelson, 1996). Second, EE shall encourage students to start businesses (Hills, 1988) and finally EE shall raise the number of start-ups in the region (Liñán, 2004). This study gives recommendations to practitioners to improve the performance of its students in a business plan teaching format to serve the first mission of EE properly. Although scholars regularly call for more innovative ways of teaching entrepreneurship, the rather classical business plan course (“How to write a business plan?”) is still a popular element of EE curricula worldwide. When active teaching elements, e.g., group work, play an integral part in the course’s pedagogical approach, the student team’s composition might impact performance. This study analyzes the effect of gender team composition on different performance measurements. The research guiding question of this study is, what impact does gender team diversity have in EE? Practitioners profit from the results by gaining insights into how a student team performs characteristically and how to optimize team composition for better performance. Students get clues on how they can improve their performance in team settings in EE.

2 Theoretical Background

In this section, we categorize the business plan teaching format in EE from a pedagogical perspective and outline results on the role of gender team diversity in EE. The section concludes with three hypotheses.

2.1 The Business Plan Course Format in Entrepreneurship Education

A state-of-the-art integrated teaching model framework to categorize teaching formats in EE (Nabi et al., 2017) consists of three primary or archetypical teaching models:

- Supply model: focus is on reproduction methods (lectures, reading, watching/listening).
- Demand model: focus is on personalized participative methods (interactive searches, simulations).
- Competence model: focus is on communication, discussion, and production.

It also consists of two hybrid models:

- Supply–demand model: mixture of supply and demand model formats.
- Demand–competence model: mixture of demand and competence model formats.

Some researchers use a simpler typology when they differentiate between reflective (rather passive consumption of knowledge) and active (active production of knowledge) pedagogical methods in EE as dichotomous categories (Walter & Dohse, 2012).

In practice, depending on the pedagogical elements, a business plan teaching format can either represent a supply model (passive course), when the focus is on lectures, or a supply–demand model course (active course), when many active teaching elements are integrated. The business plan as a didactic approach in EE has been criticized for various reasons. Exemplary is this quote: “(the) *business planning process is an attractive and powerful learning process*,” where “*a disproportionate amount of time is spent honing secondary research skills than actually taking smart action in the real world*.” (Neck & Greene, 2011). The authors contrast this approach with their own entrepreneurship as a method teaching framework, where educators shall focus on providing methodological approaches that enable students to cope with dynamic environments. Besides the potential waste of limited teaching and learning time that could be spent on more important areas of the entrepreneurial process, there are additional arguments for not using business planning in EE. Experienced venture capitalists and business angels oftentimes don’t care for lofty planning documents in their investment decision but rather focus on the entrepreneurial team or the venture’s business potential (Kirsch et al., 2009). Consequently, teaching formats shall focus on the more relevant investment criteria.

But does that mean that business plan courses are useless first from a pedagogical and second from a practical standpoint? It is important to note that critics normally don’t argue that the business plan format is missing positive pedagogic effects. They rather claim that other teaching formats are more effective. As the EE field evolved, practitioners do not only have a larger choice of impactful teaching formats, but they also know a lot more about their potential effects. Therefore, practitioners are able to enrich the classical business plan format with elements of active teaching elements,

e.g., design thinking or small group work. From a pedagogical point of view, a reflective oriented business plan has some shortcomings but active teaching elements may at least partially offset pedagogical shortcomings to develop a course of “How to write a business plan?” toward an active or supply–demand (hybrid) course. Another argument in favor of the business plan in an EE curriculum is that a hybrid business model course attracts mainly students with a low intention to start a business, the so-called “magnet effect.” The “pedagogy effect” of a business plan course is that the intention to start a company increases for the lion’s share of students. So, the outcome of a business plan course can be substantial and fulfills the goal of EE to raise entrepreneurial intention rather efficiently as those courses can address a higher volume of students than comparably smaller active courses, e.g., lean start-up camps that require a vast amount of staff resources (Schultz, 2021).

2.2 Gender Diversity in Teams

In a first step, practitioners need to be aware of the different performance characteristics of course formats in order to strategically plan an EE curriculum that meets all targets of EE sufficiently. In a second step, they can take operative measures to further enhance the performance of each course regarding the students’ learning success and overall learning experience. From a practitioner’s point of view, an area of potential improvement is the team’s composition, which leads to the question, what are the best-performing teams? A team is a “*set of two or more people who interact dynamically, interdependently, and adaptively toward a common and valued goal/objective/mission, who have each been assigned specific roles or functions to perform, and who have a limited life-span of membership.*” (Salas et al., 1992).

Team diversity has been investigated in different contexts from management teams (Ensley & Hmieleski, 2005), entrepreneurial teams (Chowdhury, 2005), or student teams in EE (Hoogendoorn et al., 2013). The literature differentiates between two areas of diversity, first task-related (skills, work experience, academic background) and second biodemographic diversity (gender, age, ethnicity). Same-gender teams are an expression of homophily, which is the individual tendency to associate with other individuals that resemble yourself in different aspects. Homophily can circumvent areas from ethnicity, age, and gender to education or religion. The probability of forming a homophile entrepreneurial team regarding gender is higher than in random matching (Ruef et al., 2004). But the results on the relationship of team diversity and performance are far from homogeneous and need to be discussed in its empirical context. In a meta-analysis of 35 articles, the authors find indicators of a positive relationship of task-related diversity and no significant relationship between biodemographic diversity and team performance (Horwitz & Horwitz, 2007). In a meta-analysis of 92 sources, gender team diversity has small negative effects on team performance, while age differences are not significant (Bell et al., 2011). Diversity affects different conflict categories and increases the potential for conflict (Pelled et al., 1999). In some cases, dissimilar belief systems of team

members that surface in different team processes might lead to conflict and negative performance effects (De Wit et al., 2012).

In a study in the entrepreneurship field based on 79 interviews, demographic (gender, age) or background diversity aspects are not important for the entrepreneurial team's effectiveness (Chowdhury, 2005). Other researchers even state that the approach to take demographic factors such as gender, age, or ethnic groups as predictors of entrepreneurial behavior is conceptually unsound (Liñán & Santos, 2007; Der Foo et al., 2005).

2.3 *Hypotheses*

While there are strong arguments and some empirical evidence that homophile teams perform inferior to diverse teams, the empirical results in the EE context are heterogeneous. In a group of Harvard students, homogeneity in ethnicity increases team performance (Gompers et al., 2017). But it only raises low-performance teams to a median performance level. Other factors, e.g., gender, education, or past work experience, are not significant determining factors. Gender diversity of student teams in an entrepreneurship program in the Netherlands has positive effects on their performance (Hoogendoorn et al., 2013). The teams are randomly assigned to avoid self-selection bias. The specific teaching context is not business planning but managing a micro company as a team that is supposed to be economically active for at least 1 year. The main result is that teams with an equal gender mix perform better than male-dominated teams in terms of sales and profits. Although the authors analyze multifaceted data, e.g., the team's characteristics (age, atmosphere), individual personality traits (big five inventory; agreeableness, conscientiousness, extroversion, neuroticism, openness to experience), and team processes (group potency, decision-making, mutual monitoring, coordination, credibility, specialization), they don't find any explanation for their findings. The resulting hypotheses are the following:

Hypothesis 1: *A student team's gender composition influences the performance in writing a business plan in an active EE course.*

Hypothesis 2: *Mixed-gender teams perform comparatively better in developing a business plan than homophile gender teams in an active EE course.*

Although the notion that entrepreneurial intention is, on average, higher among men than women (Scherer et al., 1990; Zhao et al., 2005) is debated (Maes et al., 2014), a more recent study (Do Paço et al., 2015) shows that, even in the absence of access to EE, men possess a higher entrepreneurial intention than women. When men are more interested in entrepreneurial activity, it is logically consistent to expect that men will make a greater effort to outline their business ideas, which could result in a comparable higher performance. Against this logical conclusion stands the empirical finding that male-dominated teams underperform in sales and profits in an EE management game (Hoogendoorn et al., 2013). But in the context of a

business plan course, men might perform differently. The derived hypothesis is the following:

Hypothesis 3: *Men's teams perform better than women's teams in writing a business plan in an active EE course.*

3 Methodology

This section depicts the empirical approach to test the proposed three hypotheses (see Table 1). Many studies in EE do not sufficiently describe the pedagogical approach of the research setting. But a comprehensive description is essential for other researchers to appraise the results adequately. Therefore, this study describes the sample and its context extensively.

3.1 Sample

The data stem from an “Entrepreneurship and Business Planning” course in a bachelor’s degree program in business administration at a medium-sized university in Germany, specifically from two winter terms in the years 2014 and 2015. The participants are bachelor students in their fifth semester. During the semester, student teams work on a business plan for a start-up idea they develop on their own under the guidance of the teaching personnel. Because more than two students work toward the common goal of developing a business plan during one semester, this organizational mode qualifies as a team. Students receive a grade on their business plan and a written exam at the end of the semester on basic topics of entrepreneurship. Students

Table 1 Description of variables

No.	Variables	Description
1	Grade of the team's business plan	Dependent Variable I Grades start with 1.0 as the best grade and then 1.3, 1.7, 2.0, . . . , and 4.0 as the worst grade
2	Views on an online idea platform	Dependent variable II Counted views of a team's idea poster on an online platform
3	Team diversity	Independent variable with three categories <ul style="list-style-type: none"> • Mixed team (male and female team members, at least one member of the opposite gender) • Women's team (exclusively female team members) • Men (exclusively)
4	Team size	Control variable Number of team members
5	Semester	Control variable Dummy variable of semesters A and B

attend lectures by faculty members and guest speakers on different business plan components. To enhance the inclusion of the market perspective, it is obligatory that every team participates in a state-wide external business plan competition. As a result, students receive not only feedback from faculty members but also from external jurors on the different stages of their business plans. The course starts with an introduction to entrepreneurship and business idea generation followed by a “Market of Ideas,” where every team presents its idea poster of a potential business to fellow students and faculty members. One week in advance, all teams upload and share their digital idea posters on the “Idea Generator.” Through this platform, every course participant and the teaching staff can comment and give feedback publicly to enhance the business idea. The idea posters were accessible until the end of the semester to all participants to gather feedback and comments throughout the semester. Normally, students revise their business ideas based on early feedback before they enter the writing process of their business plans. In addition, every team needs to attend three peer review sessions with an exclusive focus on the proper development of their business plan. Faculty members supervise these sessions and provide every team with the possibility to present their development stage to their peers and experts in the field.

The sample stems from this course which fulfills the criteria of a supply–demand (hybrid) course (Nabi et al., 2017) or active course (Walter & Dohse, 2012), where traditional teaching components (e.g., lectures) are enriched with active teaching elements. In this business plan course, those active teaching elements included small group work, creativity exercises, the introduction of role models, student-oriented teaching, and feedback processes within the business planning process. As the active teaching elements were a substantial and integral part of the overall pedagogy, this course qualifies clearly as a supply–demand (hybrid) or active course.

3.2 Variables

In this study, team performance in developing a business plan is first measured by the received grade on the business plan and second by the views the idea posters generated on the digital idea platform (see Table 1). To define the grade as a performance indicator is straightforward in a course of higher education. Professional teaching staff scored every business plan on ten categories to determine the final business plan grade. Views are a valid performance indicator as comparable; more views show that the business idea is assessed as more interesting. Although skeptics can make the case that very bad as well as good business ideas attract attention, the practical experience is that the above average business ideas receive more attention as participants don't put effort into looking at low-quality ideas. This study uses team size as a control variable as larger (or smaller) teams might have a significant advantage (disadvantage). Additionally, the specific semester is a control variable as different teaching styles by lecturers and faculty in general might affect the teams' effectiveness.

3.3 Results

A total of 345 students (women: 180, men: 165) participated in two courses. The distributions of gender and teams per semester show no obvious distortions (see Table 2). 31 single female and male students are excluded from the study as the focus is on team performance.

The lion's share of team size is three students, but there are some teams who are larger or smaller due to personnel preference.

Table 3 presents the grade performances of the different team categories in developing a business plan and in the written exam on entrepreneurship topics at the end of each semester and views of the business idea poster on the dedicated digital platform. On average, students perform better in business planning than in the written exam. The platform's backend counted a total volume of 3.673 views in semester A and 3.837 in semester B. As semester B had fewer participants and teams, a higher view count suggests that the platform gained in user acceptance. Furthermore, 90% of the business idea posters in the sample received 134 or less views. Above this threshold, mixed teams are dominant. This study uses a simple linear regression to analyze the effect of team composition on the performance indicators team grade for a business plan and views of the business idea posters on the digital idea generator platform. Team categories are entered as dummy variables

Table 2 Teams in the sample

Semester	Men's team	Women's team	Mixed team	Total
A	45	/	49	94
	/	47	50	97
B	36	/	35	71
	/	46	37	83
Total	81	93	171	345

Table 3 Descriptive statistics on grades (business plan, entrepreneurship exam) and views of the business idea poster on the digital idea platform per team in semester A and semester B

Sem.	Composition	Business plan			Entrepreneurship exam			Views		
		Mean	Med.	SD	Mean	Med.	SD	Mean	Med.	SD
A	Men	1.98	1.70	0.84	2.03	2.00	0.83	53	59	41
	Women	1.60	1.30	0.75	2.04	1.70	0.98	59	57	32
	Mixed	1.53	1.30	0.71	2.13	2.00	0.92	92	75	89
	Men (overall)	1.74	1.70	0.80	2.12	2.00	0.88	/	/	/
	Women (overall)	1.57	1.30	0.73	2.05	1.70	0.95	/	/	/
B	Men	1.75	1.70	0.61	2.69	2.70	1.20	69	68	35
	Women	1.61	1.70	0.45	2.27	2.00	1.38	66	64	33
	Mixed	1.69	1.30	0.80	2.11	2.00	1.08	119	100	95
	Men (overall)	1.67	1.70	0.67	2.43	2.00	1.10	/	/	/
	Women (overall)	1.68	1.70	0.66	2.17	1.70	1.30	/	/	/

into the regression model. To avoid multicollinearity between the independent variables, one out of the three categorical variables in each calculated linear regression model is dropped. This procedure results in three models for each of the two dependent variables for a total of six regression models (see Table 4).

The variance inflation factor (VIF) as an indicator for multicollinearity lies under the critical value of 4 in every model. The Durbin–Watson statistic as a test for autocorrelation in the residuals doesn't reach worrying values of under 1 or more than 3. There is no indication that multicollinearity and autocorrelation distort the regressions' results. The corrected r^2 shows how well the model fits the linear regression models and indicates the percentage of the variance in the dependent variable that the independent variables explain collectively. As corrected r^2 doesn't exceed 0.086, there are probably variables in the model missing that would raise the models' fit. The first model shows that affiliation with a mixed or women's team improves the average grade for a business plan significantly. The beta coefficient is negative as a smaller number indicates a better grade. Models 2 and 3 show that men's teams perform, on average, significantly worse in business planning. Models 4 and 5 show that affiliation to a mixed team results, on average, in a significantly positive effect on views on the digital idea generator platform. Model 6 shows that affiliation to a women's or men's team has, on average, a significant negative effect on the number of views. The dummy variable semester serves as a control variable and is significant in models 4–6. A plausible explanation for this effect is that in semester B the students accepted the idea generator platform as a viable feedback instrument and were more active in giving feedback and viewing their peer's idea posters. The descriptive statistics on views support this argument.

Table 5 gives an overview of whether the hypotheses are confirmed or rejected.

4 Conclusion

This study shows that in the specific context of a business plan course in EE non-task-related team diversity has effects on different performance indicators. Gender-mixed teams write better business plans and generate more interest in their start-up idea.

These results are contrary to research that only finds performance effects for task-related areas (Der Foo et al., 2005). Whether the effects disappear when task-related diversity aspects are considered cannot be determined with the available data. But it is highly questionable to what extent bachelor students of the same semester in the same educational program at the same university can differ considerably regarding typical task-related indicators such as work experience or competencies. Some studies offer different approaches to explain gender-specific diversity performance differences ranging from individual personality traits to team processes and didn't find any explanation for their findings (Hoogendoorn et al., 2013).

The question that remains is, why are mixed teams more successful in a business plan course? The answer may lie in the distinct task requirements. To develop a

Table 4 Parameter estimates of six linear regression models

Model		Unstandardized errors		Standard coefficient Beta	T	Sig.	Collinearity statistics	
		B	Std. error				Tolerance	VIF
1 ^a	(Constant)	1.882	0.175		10.774	0.001		
	Mixed team	-0.303	0.101	-0.203	-3.002	0.003*	0.618	1.619
	Women's team	-0.299	0.111	-0.175	-2.706	0.007*	0.677	1.478
	Team size	-0.002	0.058	-0.002	-0.029	0.977	0.891	1.123
	Semester	0.055	0.080	0.036	0.680	0.497	0.993	1.007
2 ^b	(Constant)	1.706	0.172		9.929	0.001		
	Mixed team	-0.041	0.100	-0.028	-0.412	0.681	0.632	1.583
	Men's team	0.228	0.113	0.128	2.020	0.044**	0.705	1.419
	Team size	-0.029	0.059	-0.028	-0.492	0.623	0.874	1.145
	Semester	0.056	0.081	0.037	0.692	0.489	0.992	1.008
3 ^c	(Constant)	1.726	0.181		9.535	0.001		
	Women's team	-0.037	0.098	-0.022	-0.379	0.705	0.872	1.146
	Men's team	0.241	0.101	0.135	2.394	0.017**	0.888	1.126
	Team size	-0.041	0.056	-0.040	-0.731	0.465	0.970	1.031
	Semester	0.060	0.081	0.040	0.744	0.457	0.994	1.006
4 ^d	(Constant)	56.005	16.585		3.377	0.001		
	Mixed team	40.806	9.645	0.283	4.231	0.001*	0.599	1.669
	Women's team	-1.624	10.384	-0.010	-0.156	0.876	0.653	1.531
	Team size	-0.207	5.505	-0.002	-0.038	0.970	0.891	1.122
	Semester	17.062	7.527	0.118	2.267	0.024**	0.989	1.011
5 ^e	(Constant)	56.100	16.116		3.481	0.001		
	Mixed team	40.039	9.243	0.278	4.332	0.001*	0.652	1.533
	Men's team	-3.593	10.593	-0.021	-0.339	0.753	0.726	1.378
	Team size	0.013	5.552	0.000	0.002	0.998	0.876	1.142
	Semester	17.003	7.527	0.118	2.259	0.025**	0.989	1.012
6 ^f	(Constant)	82.241	17.025		4.831	0.001		
	Women's team	-40.064	8.995	-0.247	-4.454	0.001*	0.868	1.153
	Men's team	-41.808	9.575	-0.240	-4.366	0.001*	0.886	1.129

(continued)

Table 4 (continued)

Model	Unstandardized errors		Standard coefficient			Collinearity statistics	
	B	Std. error	Beta	T	Sig.	Tolerance	VIF
Team size	4.239	5.285	0.042	0.802	0.423	0.963	1.038
Semester	16.801	7.511	0.116	2.237	0.026**	0.990	1.010

n = 343; *sig. < 0.01, **sig. < 0.05

^aDependent variable: business plan grade, corrected r^2 0.022, Durbin–Watson 1.234

^bDependent variable: business plan grade, corrected r^2 0.017, Durbin–Watson 1.234

^cDependent variable: business plan grade, corrected r^2 0.017, Durbin–Watson 1.234

^dDependent variable: views, corrected r^2 0.083, Durbin–Watson 1.916

^eDependent variable: views, corrected r^2 0.083, Durbin–Watson 1.915

^fDependent variable: views, corrected r^2 0.086, Durbin–Watson 1.905

Table 5 Overview of hypotheses and results

No.	Hypotheses	Expected result	Results	Confirm/reject
1	A student team's gender composition influences the performance in writing a business plan in an active EE course	Team categories are significant performance predictors.	<ul style="list-style-type: none"> Team categories are significant predictors of performance in different regression models. 	Confirm
2	Mixed-gender teams perform comparatively better in developing a business plan than homophile gender teams in an active EE course	Mixed-gender teams receive, on average, better grades than other team categories Mixed-gender teams attract more views of their business idea posters than other team categories	<ul style="list-style-type: none"> Descriptive statistics show that affiliation to a mixed-gender team results, on average, in a comparatively better business plan grade and more views The linear regression model shows that the mixed-gender category has the comparatively largest effect on grade and view performance 	Confirm
3	Men's teams perform better than women's teams in writing a business plan in an active EE course	Men's team affiliation has a higher positive effect on the business plan grade and on views than women's teams	<ul style="list-style-type: none"> Affiliation with a men's team has a negative grade effect on the business plan Women's teams receive better grades in the business plan category than men's teams Regarding the performance indicator views on a digital platform, no significant results are available 	Reject

business idea from scratch is a creative task, where especially homophile men's teams are seemingly less effective. This might be due to less creative ability or an unfavorable team dynamic. That the worse performance is due to less motivation is rather unlikely considering that the men's entrepreneurship exam grades don't differ significantly from those of women. That diverse teams oftentimes possess advantages in creativity is underscored by a large meta-analysis (Horwitz & Horwitz, 2007). Each gender may contribute characteristic competencies that complete the team's competence portfolio, e.g., in regard to the quality of creative output and the integration of different perspectives. To find out what these competencies are, how they are characteristically bound to gender and how they interact in an EE context are promising research endeavors. For lecturers, these results are an impulse to pay more attention to gender composition in teamwork assignments and to point out to students that mixed-gender teams perform on average best in the business plan EE context. In particular, male students should take this recommendation to heart, as they profit considerably from teaming up with women.

Critics may argue that this finding is of little relevance as a business plan course is still about planning and doesn't provoke entrepreneurial action in real life. While this course type has its inherent limitations in enhancing the student's entrepreneurial intentions and initiating entrepreneurial activity, recent empirical research shows that a supply–demand business plan course can contribute to a rise in the student's entrepreneurial intention and entrepreneurial activity (Schultz, 2021).

There are two main reasons for the mixed empirical results in the literature on gender diversity in different educational settings: first, inconsistencies in the research design and second, the influence of contextual factors. In regard to the first argument, a potential shortcoming of this study is that students self-selected into teams and that therefore the low and high performers were free to conglomerate. In this study, the results of linear regression models with the dependent variable entrepreneurship exam grade show no significant results that team affiliation has a significant effect on exam performance. When team affiliation is independent of exam performance, there is less indication that high or low performers selected themselves in characteristic teams. Furthermore, to criticize self-selection is valid from a strictly theoretical perspective, but it is out of touch with reality. Normally, entrepreneurial teams as well as student teams don't form by chance under controlled conditions. They form by choice, which makes self-selection rather a property of real life and in EE a part of the learning experience. In regard to the second point of critique, it seems evident that contextual factors ranging from educational settings (e.g., course type, EE pedagogy) to culture possess influence. As a business plan course is part of the EE curriculum at many higher learning institutions, opportunities exist to replicate this study on a larger scale. Then, it might become possible to explore the effects that lead to team performance differences in detail.

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The “Start-Up” Answer: Examining a Hidden Dramaturgy in Entrepreneurial Learning Beyond the Four Walls of the Classroom



Nicolai Nybye

Abstract This chapter, based on findings from an ethnographic field study of entrepreneurship in the realm of non-business educations, combines the logic of effectuation and a narrative discursive perspective, enabling us to see how a certain language of entrepreneurship *in use* affects the meaning making of students and is perceived by them as counterproductive. The chapter provides insight into normally more hidden sides of student entrepreneurship and analyzes how the “start-up” as grand narrative filters into the micro-processes of students involved in an extracurricular entrepreneurial process. The chapter reflects how language is used as logic, which, however, is also a possibility to choose new pathways in advice, guidance, and training of entrepreneurial expertise among students practicing entrepreneurship.

Keywords Entrepreneurial learning · extracurricular · effectuation · narratives · entrepreneurial forces

1 Introduction

Entrepreneurship is increasingly embedded into both business and non-business education programs (Blenker et al., 2011). Hence, entrepreneurial learning becomes increasingly important in societies dealing explicitly with change, based on individual, organizational, and societal entrepreneurial “capacities” (Gibb, 2002) and value creation (Lackéus, 2018). As part of the growing focus on entrepreneurship, higher educations also offer and develop new extracurricular activities to support entrepreneurial learning among students, which, however, is still an under-research area (Pittaway et al., 2015; Preedy & Jones, 2017; Preedy et al., 2020). The extracurricular side of entrepreneurship expands to a broader view of the entrepreneurial

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classroom that like experience-based entrepreneurship education (EE) “moves beyond the traditional view on the classroom” (Wraae, 2022). Hence, while the forms “about” and “for” entrepreneurship have dominated the development of EE (Pittaway & Edwards, 2012; Robinson et al., 2016), students’ extracurricular engagement shares a learning potential with the learning typology “through” entrepreneurship (Pittaway & Edwards, 2012). Furthermore, it is argued that *through* entrepreneurship has the most potential to make students experience what it means to be an entrepreneur because they work with real-life issues through projects or activities (Pittaway & Edwards, 2012; Robinson et al., 2016). Thus, students create “empathy with the life-world of the entrepreneur” by experiencing uncertainty and complexity and learn what it means in practice to develop key relationships (Pittaway & Edwards, 2012). However, while engaging in student-led groups and being part of business competitions or incubators contribute to experience-based learning, these activities are not in themselves leading to deeper learning because the conscious use of reflection is hard for students to undertake (Preedy et al., 2020). Hence, the very nature of the extracurricular experience and the perceived value of it both need more focus and not just the activities per se (Preedy et al., 2020). This chapter takes up a learning experience from a single case (Yin, 2014) of a student-led group of three non-business occupational students engaging in an extracurricular entrepreneurial process. With the advice from a Student Incubator, the students involve in a micro-grant funding at the Danish Foundation for Entrepreneurship and experience a rejection of the application that is evaluated as not being a “start-up” with business potential. To analyze how this answer affects the students’ learning experience, the chapter asks, *What is the nature of the “start-up” narrative in the rejection and how does it affects the students’ entrepreneurial learning experience?*

The chapter starts by outlining an analytical lens combining effectuation (Sarasvathy, 2001) and a narrative view of entrepreneurship (Gartner, 2010) in order to grasp the intersubjective nature of the meeting between the students and market logic in the rejection. After presenting the methodology, the chapter analyzes and discusses the logic of the rejection and how the students experience its consequences. It concludes by opening up toward the value of critical reflection and of dialogue in the practice of entrepreneurship. It is not the objective of the chapter to judge whether the rejection is right or wrong. The chapter is about learning from practice in order to improve future entrepreneurial learning when the grand narratives of entrepreneurship (Fletcher, 2007) are embedded in the curriculum as well as extracurricular activities across the domains of business and non-business educations.

2 Analytical Lens

Effectuation represents a niche in its complementarity to the logic of causal strategic courses in business schools and to the business plan paradigm (Mansoori & Lackeus, 2020; Sarasvathy, 2008). Hence, effectuation logic challenges linear causality by providing a theoretical and methodological language that is more about variation than linear processes (Sarasvathy & Venkataraman, 2011), though effectuation and causation coexist as logics that appear in decisions in different phases (Matalamäki, 2017). For instance, effectual logic is regarded to be dominant in the early stages of new venture creation, which is about how entrepreneurs design physical or social artifacts under high uncertainty and unknowable environmental circumstances (Mansoori & Lackeus, 2020; Sarasvathy, 2008) as well as in existing organizations (Berends et al., 2014; Matalamäki, 2017). In effectuation, artifacts are the objects created in the effectual process that can be physical products, new services, and the social structures that emerge as new firms or markets. The origin of this artificial thinking finds its roots in the *science of the artificial* of Simon (1996), and through Sarasvathy’s initial research on expert entrepreneurs, the two theories have been merged (Sarasvathy, 2008). From the research on entrepreneurial expertise, it shows that expert entrepreneurs basically avoid causal market analysis techniques in favor of various subjective rules of living in the initial phases of new venture opportunities (Dew et al., 2018). Underpinned by Simon (1996), effectuation hereby challenges the view of *maximization* in decision theory, arguing that humans do not adapt in a perfectly rationally determined way to externally defined goals (Kalinic et al., 2014). Instead, as stressed by the “who am I” in the Bird-in-the-Hand principle in the effectual method, it is different people’s personal means, aspirations, and actions that through interplays with an outer environment shape the relevance and value of new artifacts (Sarasvathy, 2008). Thus, the effectual research shows that expert entrepreneurs don’t forecast relevance and value in any absolute sense through analytical tools *prior* to own actions but rely on contingencies, events that *may* occur (the Lemonade principle), affordable risk taking (the Affordable loss principle), and on co-entrepreneurial collaboration (the Crazy Quilt principle) (Sarasvathy, 2008). Both Simon and the effectual paradigm are skeptical about forecasting designs of the future, and effectuation takes up this temporal challenge of finding a way to create artifacts without forecasting through the basic worldview of non-forecasting control (the Pilot-in-the-Plane principle) (Sarasvathy, 2008). This effectual logic finds its stance in a pragmatist-epistemology where knowledge is not an absolute essence in itself (Biesta & Burbules, 2003). Instead, knowledge is connected to what is of practical value and to the ongoing making of meaning through “effectual action” that finds “its distinct philosophical stance in pragmatism” (James, 1907; Sarasvathy, 2008, p. 190).

Hence, the effectual logic is as in pragmatism in that sense open-ended (Biesta & Burbules, 2003; Dewey, 1929; James, 1907). It makes us see, grasp, and learn that variation in entrepreneurship is natural; it changes reality based on what works rather than relying on the essences of absolute truth (Dewey, 1929; James, 1907). Instead, a

consequence of the pragmatist position is that the entrepreneurial process comes about as people create meaning *living forward* (Weick, 1999) rather than planned by absolute theories (Sarasvathy, 2001). The section below connects effectuation to a narrative approach to understand how meaning is created in the relationship between entrepreneurial students and outer circumstances.

2.1 Meaning Through Narratives

Gartner (2010) argues that to practice and study ongoing dynamics of the interrelatedness of an intention/action/circumstance condition in entrepreneurship, we need a language that encompasses entrepreneurial experience and variance over time. Entrepreneurs find themselves in situations and events (circumstances) that challenge and modify their initial intentions, and he therefore suggests a narrative approach to entrepreneurship because, based on Polkinghorne (1988), “narrative knowing” captures the “meaning making” of humans (Gartner, 2010, p. 11). Hence, the form of a narrative compresses the meaning from various situations and events into a “particular type of discourse” (Polkinghorne, 1988, p. 36), which makes Gartner (2010) place the *text* as analytical object. Hereafter, *Text* is written with a capital letter to mark that it has this analytical status. The narrative Text aspect, then, is a way to deal with experience that is otherwise difficult to grasp - a challenge also known to entrepreneurship education (Hägg & Kurczewska, 2016). Furthermore, the Text as object makes it possible to work with different interpretations of situations and events (Gartner, 2007, 2010; Popp & Holt, 2013). Here, an advantage of the narrative approach is that it deals with time and the temporal relation between actions of the past, present, and future, which is in line with the effectual philosophical transformational stance of pragmatism (Sarasvathy, 2008).

Another advantage of the narrative approach is that the focus on language and meaning enables us to investigate what, with reference to Lakoff and Johnson (1980), will be a metaphorical dimension of narratives and artifacts. Narratives and artifacts are not neutral descriptive elements but have an impact on meaning and experience through the use of metaphors (Dodd, 2002; Smith & Neergaard, 2007). Basically, a metaphor establishes an immediate meaning by cross-referring to two domains like seeing *innovation as a journey* (Van de Ven, 2017). In the Lakoff-Johnson framework, understanding one thing in terms of another is a structural metaphor; to this they add orientational/spatial metaphors (e.g., up-down, in-out, central-peripheral) and ontological metaphors (e.g., the experienced world as entities, containers, substances, and personifications). Of special interest in this chapter is what Lakoff and Johnson call the cultural coherence of the way metaphors are used to value experience in various subcultures, for instance, when a certain meaning is valued and prioritized as UP, IN, or OUT (Lakoff & Johnson, 1980). Such uses also carry potential conflicts because, as Dewey argues from the pragmatist perspective, humans might take what is of *chief value* to them as *the real* (Dewey, 1929). To Dewey, a prioritization of value happens as a result of “selective emphasis” (Dewey,

1929). One problem for Dewey is that selective emphasis not only promotes a particular dominant way of thinking about purpose; the purpose in itself also produces an acceptance of the parts that are left out of the purpose, precisely because they are omitted with a purpose. The general insight from this is that a discourse can thus promote a naturalization of a certain reality as more real than another, or, as Dewey explains: “It is natural to men to take that which is of chief value to them at the time as *the* real. Reality and superior value are equated” (Dewey, 1929, p. 52).

Entrepreneurship in this narrative and metaphorical light is not about static meanings but about how social reality gains meaning (Garud et al., 2014; Smith & Neergaard, 2007). Thus, following Venkataraman et al. (2013), narratives about entrepreneurial agency can be either distributed or located within individuals and affect the belief people have about entrepreneurial action. Furthermore, artifacts can both be infused with narrative meaning and also be capable of driving social and economic change (Venkataraman et al., 2013). Finally, narratives themselves as artifacts can be strong influencers of social reality (Venkataraman et al., 2013), which is also about how institutional facts are created as social reality by the use of language and speech acts (Searle, 1995). However, in the very practice of entrepreneurship, meaning is performed in concrete situations, where the “Ask” is used as an effectual concept to define what characterizes a significant activity in the early stages of entrepreneurial processes (Dew et al., 2018). The Ask is framed as an important building block in developing entrepreneurial expertise as deliberate purposeful engagement in situations of high uncertainty and deep dependence on human intersubjectivity (Dew et al., 2018). Here, the “tentative ask” and the “co-creative or effectual ask” respond to complex situations that require an open-ended form of inquiry low on prediction, where stakeholders are invited to shape and commit themselves to the entrepreneur’s ideas. Such situations are compared to the causal Ask that counts the “pitch” and the “transactional ask” like negotiations where the prediction of desired outcomes constitutes the performed situations (Dew et al., 2018). It is important to note that the Ask involves the Askee (Dew et al., 2018), and as the analysis shows, *the answer* as narrative is important to investigate further to understand how to train entrepreneurial expertise in the interplay between the social reality of entrepreneurship and student entrepreneurs (Venkataraman et al., 2013). This is in line with the narrative reader-response-theory approach advocated by Fletcher (2007), which focuses on the “stretchiness” of entrepreneurship narratives. Following Fletcher, the “stretch” enables us analytically and in educational situations to go beyond the text to how different people connect to a text and to investigate why and with what effects the grand “narrative world of entrepreneurship” filters into the micro-stories of people across contexts (Fletcher, 2007, p. 651).

In accordance with the latter, narratives are closely linked to a discursive approach, and according to Hjort and Steyaert (2004), there is no clear division between the two. Instead, they argue that the language dimension in entrepreneurship makes it apparent that entrepreneurship is a creative force in society that affects and changes daily practices and lives. This is about how the future orientation in entrepreneurship is invented “in populating histories of the present, here and now” (Hjorth & Steyaert, 2004, p. 3). Thus, the events of the *here and now* of everyday

entrepreneurial processes are organized in stories and conversations as a primary form of knowledge in social situations constituted by *the discursive nature of knowledge, self-narratives, subject positions, desires, attention, resources, and images* (Hjorth & Steyaert, 2004). These stories are, however, also the object of critical entrepreneurship research showing that the entrepreneurship discourse and established narratives generate not only bright effects but also dark sides, e.g., through heroizing narratives that can be difficult to live up to (Berglund & Johansson, 2012). Summarizing, building on effectuation, the analytical lens makes it possible to understand how and why logics shape the initial stages of entrepreneurial processes of students. Furthermore, connected with the narrative dimension, the analytical lens sheds light on and capture the meaning making when students engage in early stage entrepreneurship including experienced consequences of the way interactions actually unfold as part of outer circumstances. To investigate these aspects, the next section presents the empirical data, which is followed by the analysis of how a *start-up-logic* shapes the understanding of entrepreneurship for students and which experienced consequences this shaping of reality has.

3 Methodology

The data emanate from a larger case study that, from a perspective of pragmatism as philosophy of science, studied *how, why, and with what consequences* undergraduate students make meaning *through entrepreneurial projects* (Nybye, 2020). The study took place within the student context of a Danish University College providing Professional BA programs in various welfare professions. In order to investigate the entrepreneurial processes as they were experienced by the students *in situ*, the research project was conducted as a rich, detailed qualitative ethnographic field study (Eberle & Maeder, 2016; Lofland et al., 2006). The data were gathered through observation, video/audio-recordings, interviews, and written and visual materials from ten cases of students creating new ideas, which overall purposes were to help and assist other people with better options in various areas of society connected to the specific education of the students. The data collection had the following courses as a starting point: Learning Material Design and Entrepreneurship (Teacher Education); Social Innovation and Entrepreneurship (Social Education); and Innovation Across Health Professions. However, one case of three students (Occupational Therapy (OCT)) was an outlier in the data material as they expanded a course on Health and Work Environment into an *extracurricular early-stage entrepreneurial process* (Nybye, 2020).

In this chapter, I take the OCT team case as a single case that is *revelatory* of *longitudinal* process data prior to and after critical events (Yin, 2014). As part of a curricular course, which combine theory and practice-based learning, the students develop a product idea in the area of work environment *through* external collaboration situated within a microbiology laboratory at a Danish university hospital. At the

laboratory, the bioanalysts have for a long period been experiencing arm and shoulder pain from poor working postures when they reach out for laboratory and analysis equipment at the lab’s work stations. The OCT students, who are in their final semester, succeed both in teaching the laboratory technicians about anatomy, workloads, and working postures and in developing an idea for a physical product that can remedy the arm and shoulder problems. The students apply mathematical calculations from the Danish Working Environment Authority to develop the product idea, which is designed as a transparent table mat with a windscreens-wiper area divided into three visual fields that are to mark the optimal and less optimal places to place equipment (Appropriate Reach Mat). As part of the extracurricular process, the students are guided by student incubator consultants to make a prototype in collaboration with employees in a “Fab-Lab” at the local business academy.

The situation then is that after the exam in the Health and Work Environment course, the students decide that their idea is worth pursuing and investing their spare time in. The team leader at the hospital has heard that the students will continue their process and sends an e-mail to let the students know that they need and require the product and would otherwise consider developing it themselves. On the advice of the student incubator, the students apply for funding to secure IPR Design Protection through a micro-grant program hosted by the Danish Foundation for Entrepreneurship. The application consists of an application form in which the students must account for a business model and a video-recorded pitch. The analysis in the overall research project reveals that the business language inherent in these formats is experienced by the health students as foreign to them and thus as something they have to interpret, make sense of, and acquire in order to fulfill the micro-grant application.

As part of the micro-grant procedure, an evaluation committee consisting of a third-party evaluator from a national Inventor Advisory Service rejects the application, arguing that the product is not a start-up with business potential. In the analysis, I take the rejection Text, in the Gartner-Polkinghorne sense, as an object that draws together meaning from a specific situation and event into a *particular type of discourse*. The following analysis, therefore, presents an excerpt from the rejection e-mail because, as the analysis shows, it compresses a larger meaning, using the *start-up* as an essential narrative shaping the answer to the students. Hence, the “start-up” appears as a grand narrative that functions as an initial analytical *entrance* to the wider meaning of the Text.

4 Analysis

The e-mail rejection Text in focus of the analysis has sender complexity built into it as two senders communicate to the students, with the host of the micro-grant program as the primary sender and the Inventor Advisory Service as the secondary

sender. The voice of the secondary sender addresses the students in the following excerpt:

It is good to see that you cultivate your professionalism, and that gives credibility. But we believe that this is a product rather than a start-up. We do not see business potential in this idea. XX [name redacted] of the Danish Technological Institute [e-mail address redacted], who sits on the evaluation committee, is happy to make himself available in relation to how you can get further advice about design protection and how it may be an idea to sell the product to a company that already sells occupational products,¹ as they are established in the market. Do use this option.

The entire Text in the e-mail is rounded off by the primary sender encouraging undergraduate students in general to enter their “start-ups” in the national “Start-Up Program” competition for students hosted by the senders themselves.

This event of rejection is critical in the students’ entrepreneurial process and therefore important to analyze further and understand in more depth *post the event* because it reveals a paradox in the case and a finding that the rejection addressed to the students creates a hidden severe *dichotomous dramaturgy* in the entrepreneurial process. On the one hand, the effectual language conveys how the students make relevant meaning in their emerging entrepreneurial process on the side of the students’ field of interest (Bird-in-the-Hand), partnering with a hospital (Crazy Quilt), and it is worth pursuing as an optional, extracurricular process (Affordable loss) (Sarasvathy, 2008). The students are evaluated positively by the head of the department at the Department of Microbiology as *help* to realize a desired future of “the perfect workplace” (Interview, 03: 54). In the interview, the students are positively described as “self-leading,” able to help with “fresh eyes,” where the department itself is “home-blind” (inured and oblivious to problems) and “cannot always see the opportunities themselves” (Interview, 15: 55). Hence, the students’ creative process interplays with the managers’ view of reality, and they make an immediate difference in that context. On the other hand, the rejection e-mail presents another reality. As illustrated above in the *start-up*-Text, the secondary sender presents several evaluative judgments to the students, describes an opportunity for advice, and gives encouragement to use the advice. Subsequently, as analyzed below, the students experience critical consequences of the e-mail, which affirms the hidden dramaturgy.

¹In the Danish version, an implicit abbreviation was used: “ergo-produkter”, which corresponds to “occu-products.”

4.1 A Hidden Dramaturgy and Its Consequences for Meaning Making

In the interview with the students, one of the students presented the experience as “a slap in the face, because we had spent so much time on it, even though we could understand the reason for the refusal.” The interview enquires further into how it may be that they understand the reason for the refusal. One of the students expresses their rationale and explains that it makes good sense, as the micro-grant program would only finance the start-up of companies, *and* they have a product (Interview, 17: 47).² While this rationale appears to be a clear recognition of the situation, it is more difficult for the students to grasp the dynamic forces affecting their process. As such, the students interpret the reason for the situation turning out as it did in different ways (coded A, B, C). Student A reflects in the interview that there may have been incorrect guidance from the incubator’s innovation consultants at the educational institution. Student B does not think that they have received incorrect guidance and believes that they were told they could read about the criteria themselves. Student C reflects that they might have seen it themselves, but they understood it differently, and concludes that the application has been a good learning situation. Almost 50 min into the interview, following a conversation about design protection, the interview returns to the “slap in the face” metaphor to investigate the meaning more closely. Student B elaborates: “It was not a slap, but something that slowed down the process and it was difficult picking up the process again.” She reflects on it and continues: “Maybe it was more a punch in the stomach.” Student A explains that it is an expression of something that is a “setback” (Interview, 47: 18).

The students apply a structural metaphorical language to grasp the experience and make the rejection e-mail meaningful. Hence, the experience is narrated as a “slap in the face” and as a “punch in the stomach.” The *slap* is connected to *time* (slowed down), a construct that Lakoff and Johnson (1980) explain is a central cultural issue, and to Lakoff and Johnson *time* is associated with other sub-categories in our daily lives. For instance, time is something you can invest (money), have enough of/run out of (limited resource), and can give (commodity); thus, time is a variant relative to situations in life where it is something we are able to control or, vice versa, something that we do not possess enough of, are not able to invest or give. The analysis shows that the rejection e-mail triggers an imbalance of time and control, and this alters what is actually experienced as meaningful by the students to a *loss of meaning*.

The process is also explained as something that is “difficult to pick up again.” It is an expression rooted in daily physical and embodied experience with the world; hence, the rejection is experienced and understood through orientational/spatial metaphor. More generally, the orientational metaphors are about valuations of

²The official background material says that grants support the start-up of business and further down the material that grants can be used to, e.g., the development of a prototype and IPR protection (secondary data).

what is up, more, less, or better, and this connects to our experiences of, e.g., “feeling up” (happy) or “feeling expansive” (Lakoff & Johnson, 1980, p. 18). Following Lakoff and Johnson, this up-down valuation is crucial in Western thought, where other cultures may pay more attention to balance or centrality (Lakoff & Johnson, 1980). As such, “up” tends to be valued better than “down,” where *up* is associated with spatial values such as better, more, and bigger, while *down* can be associated with feelings of depression or a term like lesser. Such valuations are important in the data because the start-up narrative in itself expresses this up-going reality. In addition, the start-up *attention* promoted by the *subject position* of a judge (Hjorth & Steyaert, 2004) is amplified by the overall status the start-up is given. Furthermore, this status is emphasized by the spatial perception of “business potential,” a logic that can be connected to other upward-oriented metaphors such as *growth* or the *hockey-stick* curve and a propagating, expanding orientation. Here, the analysis shows a dark side of the start-up narrative, the difficulty of “picking up again,” the “slowing down,” and “setback” of an already forward-moving process that the students experience as meaningful. However, a more subtle market logic seems also to play a role in the rejection, as discussed in the following section.

5 Discussion

In the refusal to the students, not only is a start-up valued over an emerging product; the expressions “But we believe . . .” and “We do not see business potential in this idea” promote a more invisible causal market view. Effectuation as an analytical lens challenges the objective naturalness and the normative approach with which this causal market logic is communicated to the students: what if the students are actually *creating* a market commitment through their involvement in the hospital lab established as part of their Health and Environment course? What could happen if the students created a closer partnership with the hospital? However, in the rejection, it is forecast that there is no business potential in the idea, and it is suggested that it is better that the students turn to well-known players in a well-known market. Hence, in the rejection Text, the *discursive nature of knowledge* (Hjorth & Steyaert, 2004) associated with the start-up narrative is primarily that of forecasting, and this world view is communicated to the students as a particular way of thinking.

In practice, the rejection remains unquestioned. As shown in the analysis, when one of the students reproduces the rationale in the refusal, not only, therefore, is this an acceptance of the refusal per se, but we can also see that the experience is internalized (habituation) around a dominant entrepreneurship discourse of prediction, start-up, and business potential. A problem from a pragmatist perspective is that pragmatism discusses the separation of primary experience from the language and concepts that humans use to symbolize nature and human experience (Dewey, 1929). In that regard, the primary entrepreneurial experience of the students is rooted in academic *curiosity*, and they explain that curiosity about whether the product works drives them more than the interest in making money out of it (Interview, 19:

20). A more practical value is important to the students rather than a predefined market *theory* and this drives the transformation of their ideas and aspirations into an artifact that *might* be useful in human as well in economic terms *if* it improves the work environment conditions or re-develop into new solutions in a co-creative process. Instead, the narratives of “start-up” and a predefined idea about “business potential” emphasize a social reality connected to grants (money). This is self-fulfilling because as Dewey discusses what is of *chief value* to humans risks being taken as the *real*: “Reality and superior value are equated”, as he argues (Dewey, 1929), which drives the separation mechanism and the exclusion of other values. To Dewey, this is not necessarily a problem, because as humans we can in principle turn to other aspects that present value to us. In this case, for instance, the students turn toward the completion of their education. However, one fact remains unaffected from the meeting between the health professionalism of the students and market thinking, namely that no actor questions the notions of truth and the “ultimate Being” (Dewey, 1929) of the start-up value and logic of forecasting in the rejection Text. Thus, the institutional forces remain untouched and reflection on experience in a learning perspective is absent. This leads to the following implications.

5.1 Implications for Entrepreneurial Learning Beyond the Four Walls of the Classroom

In the effectual process, experience is accumulated as the action unfolds based on the entrepreneur’s means at hand, seeking acceptable risk levels and in partnerships where people commit because they want to work together (Dew et al., 2018). Hence, entrepreneurship becomes intersubjective and “expertise acquisition” thus becomes a matter of “situated and social cognition” as well as of “individual cognition” (Dew et al., 2018, p. 401). This challenges entrepreneurial learning for students that might be inexperienced entrepreneurial practitioners because as the findings in the analysis confirm the *mutuality of situations* in entrepreneurial practice “have strong influence on activity performance” (Dew et al., 2018, p. 402). For instance, as the analysis shows, what figures as a meaningful initiative for the students is through the intersubjective engagement with institutional stakeholders (authority) turned into a *loss of meaning*. To prevent a loss of meaning from becoming an end-station, a challenge here is to turn experience into reflective meaning making as the basis for forward-moving action (Dewey, 1916, 1929) and relevant extracurricular entrepreneurial learning (Preedy et al., 2020). A future path will be how to reflect with students on the influences of values in the dynamic interplay between different actors and turn such feedback into experiences in “continuous learning” (Mansoori & Lackeus, 2020).

Effectuation suggests that market logic other than the dominant one of forecasting is possible. Hence, the analysis can be used to open up toward more open-ended guidance and answers from official enterprise advice systems and policy-driven

organizations. A possible way is to refocus dominant start-up discourse toward the social or societal effects various students create as success factors (Berglund & Verduijn, 2018), building on situations of, for instance, “tentative ask” or “co-creative ask” to shape shared conceptions and mutual learning among students and partners (Dew et al., 2018). This ideal is inherent in the pragmatist background of Dewey that believed in communication as the tool to obtain common understandings (Dewey, 1929). However, as analyzed in this chapter, such a communicative ideal cannot be taken for granted. A future question to entrepreneurial learning is how to balance asymmetric stakeholder forces when students are practicing entrepreneurship. To practice the ask together with critical reflection is therefore recommended to explore further.

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Entrepreneurship Education and Political Change: An Exploratory Study



Andreas Walmsley and Birgitte Wraae

Abstract This study explores the extent to which entrepreneurship education (EE) impacts individual political attributes at the level of the individual student. The rationale here is EE's alignment with an emancipatory principle that can also be found in Critical Pedagogy (CP). This emancipatory principle resonates with the individual recognizing their place within a socioeconomic system and subsequently seeking to change the system; i.e., they become politically engaged. Drawing on a sample of entrepreneurship students in Denmark, scores on a range of political measures were compared at the start and at the end of a semester in which students engaged in entrepreneurship education. The political measures comprised "political interest," "political orientation," "civic engagement," and "sociopolitical control." Overall, results indicate a shift toward more politically interested and engaged students. This exploratory study sets the scene for more research in this area that seeks to understand the potential inherent in EE for political change.

Keywords Critical Pedagogy · Emancipation · Politics · Political Change · Civic Engagement

1 Introduction

EE has expanded rapidly. Interest in EE, both from practitioners and scholars, persists. With this expansion, a broadening of focus in EE research is being witnessed, and while research on EE is still lagging behind its growth (Neck &

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Corbett, 2018), we are progressing beyond the “what” of EE, moving to questions about the “how” and “for whom” and also “for what purpose” (Fayolle & Gailly, 2008; Lackéus, 2015). This chapter contributes to these developments by exploring one aspect of EE that has been largely ignored to date. This is the political association of EE, and here the question as to its potential political impact at the level of the individual. While political change is not typically the primary concern of EE, this does not mean potential political implications should be ignored. We argue that EE shares some characteristics with Critical Theory, and in particular Critical Pedagogy’s focus on emancipation as propounded by Freire (2005), where education’s political dimension is not just tangential, but essential. Thus, an exploration of EE’s impact on political attributes is warranted; a more emancipated individual should be more politically engaged.

2 Critical Theory, Critical Pedagogy, and Entrepreneurship Education

The nature and purpose of higher education continue to evolve. For policymakers in many countries, the positive relationship between education and economic growth has led to a climate where HE is largely seen as a means to serve economic ends, in many respects reinforcing rather than challenging socioeconomic structures. Unsurprisingly, this has drawn criticism and concern from many who point to education’s emancipatory and even moral purpose (Lyotard, 1984; Maskell & Robinson, 2001; Delanty, 2001).

These allegations, i.e., that an excessive focus on the economic dimension instrumentalizes higher education, have also been levied against entrepreneurship (Lambert et al., 2007). The typical delivery or manifestation of EE has overridden or denied the full appreciation of its wider social benefits (Lambert et al., 2007). To our minds, a tension exists that in fact goes to the heart of the notion of the enterprise. As innovation and entrepreneurship may be regarded as the building blocks of capitalism and economic development (Schumpeter, 1961; Kirzner, 1997), rather than EE challenging the existing status quo of socioeconomic structures in society, it maintains them. The expansion of EE may then be seen as further entrenching neoliberal discourses and structural inequalities (Lackéus, 2017, 2018). On this basis, calls for more work in the area of EE’s role in neoliberal societies have been made (Berglund et al., 2020).

Nonetheless, and despite much emphasis on the economic developmental purpose in the provision of EE, following works as that by Lambert et al. (2007), a growing number of voices recognize that the reach of EE extends beyond economic concerns. For example, Bandera et al. (2020) write of unintended “dark” consequences of EE and Kuckertz (2021) mentions “higher order” goals of EE drawing on Humboldtian ideals of higher education. Others such as Rindova et al. (2009) or Calás et al. (2009) focus on the sociocultural benefits that EE can bring about, arguing there should be greater attention on this aspect of EE.

In accordance with these developments, a key idea underpinning this chapter and one we expand upon elsewhere (Walmsley & Wraae, 2022) is that EE shares many of the underpinnings of liberatory, emancipatory education. Thus, in a material sense (enrichment of poor communities), Santos et al. (2019) explain how EE can lead to empowerment. We argue though that in its focus on autonomy (Van Gelderen, 2010) and transformation (Neergaard et al., 2020; Wraae et al., 2020), EE is not just empowering, but essentially emancipatory in nature. As such, in this respect, it aligns with the purpose of Critical Theory and within the context of education with Critical Pedagogy (Freire, 2005).

The proximity between Critical Pedagogy and EE has been recognized by others, although discussions in this area are still relatively scarce. Hägg and Kurczewska (2016) do so, for example, where they make reference to Freire's notion of *Praxis* as involving reflection and action. Hägg and Kurczewska (2016) recognize education "as a means for democratization and the development of liberate free-thinking individuals" and relate these ideas to EE. Despite the emergence of alternative discourses as to EE's purpose, what has to date not happened, however, is a deliberate and targeted exploration of EE's impact on political constructs at the level of the individual (which we go on to explain below). If indeed EE is empowering and emancipatory, then we might assume this should be reflected in political constructs as they relate to students.

3 Political Change at the Level of the Individual

As far as we are aware, this is the first study of its kind that seeks to understand the extent to which EE changes political attributes at the level of the individual. As such, there is no precedent upon which to build in relation to which political attributes to include. We reviewed the broader literature in Political Science to gain some inspiration and consequently decided to focus on four measures that appear regularly in the literature: political orientation, political interest, civic engagement, and socio-political control. These constructs will now be presented.

3.1 Political Interest

Political interest (PI) has been defined as "the relatively enduring predisposition to reengage with political content over time" (Hidi & Renninger, 2006). We decided to include political interest (PI) because we wanted to move beyond a straightforward potential change in political attitudes or political beliefs, which in itself is interesting, but understand the extent to which students had become more interested, indeed involved, in politics generally (see also Civic Engagement below). PI is a recognized

indicator of political involvement (Prior & Boughey, 2018), both cognitive and behavioral, and according to Prior (2018), serves as a strong predictor of political engagement. We measured PI using the following statement as recommended by Prior and Boughey (2018), who point to its widespread use: “Would you say you follow what’s going on in government and public affairs most of the time, some of the time, only now and then, or hardly at all?”

3.2 Political Orientation

Political orientation (PO) was selected because we wanted to understand the extent to which there had been both a change in interest in politics as well as how EE had affected students’ PO. There were no compelling reasons to believe why students might have changed PO one way or the other (i.e., move to the left or the right of the political spectrum, or become more liberal or conservative in their political beliefs). We can speculate that on the one hand given the admittedly mythical/heroic status of entrepreneurs as maverick “go-getters” or archetypal capitalists, a shift to the right could have been expected, but on the other hand, universities tend to be associated with more left-leaning political thinking (Van de Werfhorst, 2020) and so a shift to the left might equally have been anticipated. Our measure of PO draws primarily on Oskarsson et al. (2015) though to an extent also on van de Werfhorst (2020). Five statements were presented about government policy on redistribution of wealth and immigration, including one question where respondents were asked to place themselves politically.

3.3 Civic Engagement

With this measure, we were seeking to understand the extent to which EE leads to an increase in civic engagement, which can be understood both as a measure of political interest and willingness to engage in civic engagement activities such as volunteering [see, for example, Hsu et al. (2021)]. The Active and Engaged Citizenship Scale is an integrated measure that assesses civic engagement (Zaff et al., 2017) and was used by Chan and Mak (2020). We adopted this 30-item measure tailoring it in small ways to suit our sample (e.g., instead of “My teachers really care about me,” we change this to “My tutors really care about me”).

3.4 Sociopolitical Control

The Sociopolitical Control Scale (Chan & Mak, 2020) was used to measure participants’ beliefs about their ability to influence social and political systems. It consists

of 17 items that assess two dimensions of sociopolitical control, including leadership competence (i.e., perceived ability to organize a group of people) and policy control (i.e., perceived ability to influence policy decisions in an organization or community) (Chan & Mak, 2020). It was decided to include this measure because it relates to both self-efficacy beliefs (Bandura, 1982) and locus of control (Rotter, 1966), which themselves are covered in some detail in the entrepreneurship literature.

4 Methodology

We employed a pre- and post-test survey on a cohort of freshman students in an entrepreneurship program at a university of applied sciences in Denmark. The bachelor program is a 1.5-year top-up study. The first semester consists of different subjects related to innovation and entrepreneurship, for instance, entrepreneurship, the entrepreneurial mindset, the entrepreneurial ecosystem, creative processes, and business models combined with traditional subjects such as project management and philosophy of science.

The overarching frame for teaching entrepreneurship at the program is “entrepreneurship as a method” (Neck & Greene, 2011; Neck et al., 2017), which implies an acceptance of the unpredictability of learning entrepreneurship as well as giving the students a body of skills that includes creativity, experimentation, play, and reflection. The students are expected to work with a business idea, which along with a prototype is assessed at an exam at the end of the semester.

Students were provided with the link to the first of the two surveys on the first day of the program in early September. Due to the pandemic, the classes went from physical presence at the university to online teaching. Therefore, the second link was distributed as a part of an online class in late November (i.e., at the end of the semester). The links were also posted on an online learning portal along with reminders. A total of 59 usable responses (out of 67) were received at timepoint 1 (T1) and 47 at timepoint 2 (T2). Although we asked students to provide a unique identifier across the two time points, only 14 did. As such, this limited the possibility of matching pairs which restricted the available tests for statistical analysis. For this reason, we have focused on using descriptive statistics (e.g., frequencies, means, etc.), although we also draw on tests of significance, specifically chi-squared tests, given their versatility.

Matching issues aside, a further limitation relates to the small sample size and hence the difficulty in extricating the causal relationship between EE and political impact and other factors that may have contributed to this, not least HE attendance itself. However, students did engage quite heavily in EE as their first semester consisted of six subjects related to EE (see above), for instance, entrepreneurship, the entrepreneurial mindset, the entrepreneurial ecosystem, creative processes, and business models combined with traditional subjects such as project management and philosophy of science. We also asked a series of open-ended questions at the end of the second survey (T2) to help us further explain our quantitative results, which helped explain the observed results.

The sample (at T1 + T2) consisted of a fairly even split of males and females (54% and 46%, respectively). There was a slight majority of international students (quite typical in Denmark for this kind of program) at 54%, with most of these from Europe (49% of the total number of students) and 5% of students came from countries beyond Europe. The mean age was 26 years, higher than for similar undergraduate programs but reflecting the type of student who typically takes this kind of course in Denmark.

5 Results

Our results were structured as follows: First, we looked at political interest, then whether there had been a change in political orientation before looking at civic engagement and sociopolitical control. Before we explored the results, we noted that we also measured entrepreneurial intent (EI) at timepoints T1 and T2 using Thompson's (2009) measure. We identified a small increase in the measure (the mean increased from 3.65 to 3.79) though the result was not significant ($p < 0.05$). We tested relationships between EI and our measures below, but none of these results were significant.¹

Starting with political interest, we asked participants the following question: "Would you say you follow what's going on in government and public affairs most of the time, some of the time, only now and then, or hardly at all?" The results were significant (using a chi-squared test, $p < 0.05$). Looking at responses in more detail, there appears to have been a jump in respondents who went from answering "some of the time" to "most of the time." A cross-tabulation by gender indicated that females were more likely to demonstrate political interest than males, though the relationship was not significant.² No statistically significant relationships were found either by nationality or social class (perceived social class: "where are you on the social ladder"), though political interest scores were somewhat lower for those who placed themselves in the lowest social classes (given low numbers this result is very tentative).

We also tried to understand whether and how EE had affected students' political orientation. As shown in Table 1, in four out of five measures, we can see a shift to the left of the political spectrum (albeit a small shift). Looking at the distributions more generally (not included here) for items 1 and 2, the distribution approximated a normal distribution. However, for items 3–5, there was a relatively large group of individuals who were clearly highly in favor of immigration as there was a skew in

¹The analysis using a chi-squared test was hampered in places by low cell counts given the relatively small sample size and distribution of the variables under investigation. We frequently reverted to transforming variables (few categories with more data in each category) to overcome this issue.

²All significance tests were undertaken at the $p < 0.05$ level.

Table 1 Shift in political orientation

		Mean		St. Dev.	
		T1	T2	T1	T2
1	Position left or right in politics (1 = strongly left; 10 = strongly right)	5.1	5.07	1.933	2.274
2	“The government should take measures to reduce differences in income levels” (1 = strongly disagree; 5 = strongly agree)	3.28	3.27	1.063	1.096
3	“Would you say it is generally bad or good for Denmark’s economy that people come to live here from other countries?” (0 = bad for the economy; 10 = good for the economy)	7.47	8.02	2.383	2.574
4	“Would you say that Denmark’s cultural life is generally undermined or enriched by people coming to live here from other countries?” (0 = cultural life undermined; 10 = cultural life enriched)	7.68	8.44	2.57	2.49
5	“Is Denmark made a worse or a better place to live by people coming to live here from other countries?” (0 = worse place to live; 10 = better place to live)	7.87	8.24	2.37	2.672

the distributions at the end of the scale (higher scores = more left-leaning). Immigration brought forth a more divisive response than the other items.

The 30-item scale we used for Civic Engagement indicated little variation of mean values between T1 and T2. None of the chi-squares tests manifested themselves as significant, offering evidence for no (or very limited) change. Civic engagement was also cross-tabulated by gender and five items presented a significant difference ($p < 0.05$), indicating greater civic engagement on the part of females as follows:

- “I feel sorry for other people who do not have what I have”
- “Contacting an elected official about a problem is something I would do”
- “Contacting or visiting someone in government who represents my community is something I would do”
- “Volunteering time (at a hospital, daycare center, food bank, etc., is something I would do”
- “Help out at school is something I would do”

There was an additional significant difference for one item where males scored higher, which was: “Being a leader in a group or organization is something I would do.”

The final aspect we looked at was sociopolitical control (SPC). This was measured using a 17-item scale (5-point Likert; 1 = strongly disagree and 5 = strongly agree). The mean value for the measure was slightly higher at T2 than at T1, indicating a small shift in SPC, though this change did not reveal itself as significant. Across all 17 items, only two scored higher at T1 than at T2, indicating further there had been an increase in SPC. Scores tended to be lower for overt political statements as opposed to leadership statements. Analysis by gender indicated few notable differences. Males expressed greater ambition to be leaders rather than followers,

but apart from that, no results were significant. Analysis by perceived social class did not reveal any significant relationships.

The survey also asked some open-ended questions giving participants the opportunity of explaining whether they felt they had changed (in terms of political outlook) and if so, how/why? Quite often, respondents simply (but usefully from a point of validity) confirmed that they did not feel they had changed. Students did mention growth in confidence and skills, and this was confirmed via some of the items in the SPC measure, especially those relating to leadership. In some instances, students appeared reluctant to acknowledge change. As one student put it: “There have been no changes because I have fixed convictions,” or “It didn’t change much because education like this one can change how I think and what tools I have but cannot change how I am.”

Many students were candid in their responses, highlighting both the pleasures and frustrations of studying. It would be hard to draw the conclusion from the qualitative data that students recognized a link between EE and any of the political measures used in this study. There was an indication from some that coming together with people from different backgrounds had made them more open-minded, potentially confirming the results from the analysis of political orientation (the measures relating to immigration). Given the relatively small changes highlighted by the quantitative results, it is possible that respondents had changed though not so much that they were aware of it. Of course, as one respondent also suggested, the limited time students had been in higher education (just over three months) was perhaps not long enough for change to occur.

6 Discussion and Conclusion

The starting point of the chapter was the suggestion that EE, in sharing many of the principles underpinning CT and specifically CP (e.g., a focus on autonomy and individual transformation), thus in many respects emancipatory in nature, could be expected to have an impact on political attributes. Emancipation understood as the freeing of oneself from oppression does not only have to occur through conventional political means (e.g., via the ballot box), and yet this is the focus here. We assumed that more emancipated (and empowered) students would become more interested in politics (political interest, civic engagement) and more confident in their ability to bring about change to the political system (sociopolitical control). We did not have any firm *a priori* assumptions about whether EE would lead to a change in political orientation (left/liberal vs. right/conservative).

Even though a traditional view of higher education would suggest its transformative potential beyond the pure economic (Mezirow, 2000), also identified by Kuckertz (2021) and Lambert et al. (2007) with respect to EE, it is not apparent (to us) that other studies have explored these hypothesized relationships empirically. This is where we believe the chapter undertakes some early, tentative steps in exploring this issue.

Perhaps the best way to summarize the data was expressed by one of the respondents as follows: "Same as before but even more." Thus, we have found some evidence of change in our political measures. Limitations surrounding small sample size (which contributes to the difficulty in establishing statistical significance), the possibility of confounding variables, and a relatively short time frame aside, for many (but not all) of our measures' scores, were already relatively high, limiting the scope for change in the direction of the variable's manifestation. Thus, students became (even) more politically interested, they became (even) more civically engaged, and perceived levels of sociopolitical control increased. They also became (even) more liberal (to the left of the political spectrum) at least with regard to immigration policy. Generally though, political orientation was a more evenly distributed variable, with similar numbers of students on either side of the right/left or conservative/liberal political divide.

Although the primary purpose of the study was to assess the impact of EE on political measures, we have also been able to make some inroads into understanding the political characteristics of the entrepreneurship student. The study is localized but offers a benchmark for others to investigate whether students in their constituencies mirror our characteristics. Interestingly, for example, we were unable to identify any differences in our political measures based on how students perceived their position in the social hierarchy and save a slightly lower level of political interest in those who placed themselves at the lowest end of the socioeconomic hierarchy. We also identified some differences between genders in their levels of civic engagement. There was some indication that males were more likely to see themselves in a leadership role. That said, the small(ish) sample size limited the number of reliable cross-tabulations that could be performed.

We encourage other scholars to use our study as a platform to further explore this still relatively unknown world of the political dimensions of EE. This could be done with larger and more diverse samples, for example. We do not believe our respondents represented a typical undergraduate student, given the mean age of 26. It is possible given that our respondents were older (on average) that their political views and attributes were more stable than those of younger students. We can only speculate that had the sample been younger, we may have seen a greater change in our measures.

Larger samples and more robust experimentation methods (e.g., using control groups primarily, as employing randomized allocation is not a viable option) would similarly open up avenues for claiming with greater certainty the impact (or lack of it) of EE on political attributes. Studies could then begin to explore the extent to which different pedagogical approaches in EE lead to what outcomes (Nabi et al., 2017; Bechard & Gregoire, 2005) and also how individual factors (age, gender, ethnicity, work experience, etc.) might moderate relationships. Thus, there is still much scope for further study in this area, and as research in EE matures, we for one welcome greater engagement with this political dimension.

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Re-evaluating Entrepreneurship Education Through a Team-Based Approach: Activities and Archetypes Within a Scottish University



Robert Crammond, Ibiyemi Omeihe, and Alan Murray

Abstract A university's overall enterprising strategy, which includes identifying key stakeholders and teaching teams, promotes Entrepreneurship Education (EE) and encourages desired behaviours such as creativity, problem-solving, and both market and risk awareness. Specifically within the classroom environment, EE is strengthened by a variety of formative or summative methods, exercises, and positive cultures. However, there is a lack of a clear conceptualisation of the team-based approach comprising EE academics.

Therefore, this chapter examines the enterprising activities and typical archetypal individuals and standards through an exploratory mixed-method study involving four selected undergraduate courses within a Scottish University. These activities and archetypes include prescriptive courses offered, surrounding enterprising opportunities for students, and influential individuals and processes. Qualitative student feedback is reviewed from across these four courses, and utilising a quantitative survey method, 136 students and staff responded from a sample of over 250 concerning themes of the embedding of enterprise in university, teaching methods, and networking with external partners.

Findings indicate a remarkable, positive reaction to course structure and delivery, the support given from the new team-based approach, and voiced a need for EE to be universal across programmes involving experienced educators and entrepreneurs. However, results display an uncertainty concerning available networking opportunities during the entrepreneurial journey.

This results in the chapter's *Team-Based Re-Evaluation Model* for EE. The model encourages systematic change towards a university's pedagogical and experiential-based EE offering, originating from enterprising academic teams. Additionally, it heightens the significance of educator personality and experience and embedding progressive, industry-relevant practices within the university context.

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1 Introduction

An institution's entrepreneurial strategy includes the identification and socialisation of key stakeholders, teaching teams, and resultant entrepreneurial ecosystems, advancing enterprising or Entrepreneurship Education (EE) (Backs et al., 2019; Crammond, 2020; D'Hont et al., 2016; Murray & Crammond, 2020). This is further evidenced through the adoption of longstanding enterprising tools or measures including practical activities for courses, digital platforms that support and augment programmes (Murray et al., 2018), encouraging group-based scenarios for staff and students, and adopting industry-relevant methods of assessment (Bliemel & Monicolini, 2020; Gianiodis & Meek, 2020). Nevertheless, this shift or sustained entrepreneurial action is dependent on resources, funding, networks (Klofsten et al., 2019), and trust (Ilonen, 2021).

Viewing through institutional and pedagogical perspectives, this chapter evaluates the progress of a recently-formed enterprise team of academics, and its unified approach, towards revising and enhancing EE through four, selected undergraduate courses within a Scottish university. This team consists of stakeholders or archetypal individuals who promote EE programmes: course leaders, researchers, and educators. This chapter reviews existing approaches to content design and delivery and both the socialisation and integration of a team-based approach to EE from both students and staff. This chapter addresses two questions concerning a team-based approach:

How Do Students Perceive a Team-Based Approach Concerning EE?

The first question is fundamentally important as it aims to provide further insight into confirming the requisite resources and adopted approaches towards productive EE within universities. Significantly, it addresses the impact of a team-based approach and how it emboldens the EE journey. This question is addressed through the empirical study of this chapter, and results shall highlight levels of enterprising engagement, from a Scottish university context, towards informing the resultant conceptualisation for wider use within the taught discipline.

What Are the Types of Institutional Activities and Range of Digital Platforms Needed for Quality Enterprise Pedagogy, Going Forward?

The second question considers what is now deemed as practically required from academics and EE-relevant stakeholders, within or out of the university, in responding to market needs and equipping students for entrepreneurialism. Reflection of course experiences seeks to respond to this question in both ascertaining the way forward for EE and the practical use of this chapter's unique offering towards resource maximisation, university strategy, and external engagement initiatives.

Within this chapter, a section concerning the *entrepreneurial university and team-based EE* highlights topics of design and delivery, the impact of a team-based approach, and the pursuit towards achieving meaningful impact in the classroom.

In addition, the *context* of this chapter and methodology is discussed, involving over 250 students and staff invited to participate in the study. *Findings* are then discussed, in advance of this chapter's *re-evaluation model*, advancing a team-based approach for EE. *Implications and recommendations*, namely concerning practice and research surrounding teams for EE, conclude the chapter.

2 The Entrepreneurial University: A Team-Based Approach

An entrepreneurial university is described as an institution involved in four key areas: facilitation of technology transfer, economic development, new venture creation, and licensing or patenting (Guerrero et al., 2020; Ilonen, 2021). Entrepreneurial universities are not just desirable but have become vital to contemporary society's relevance and long-term survival (Crammond, 2020; Kuckertz, 2021).

To describe a university as entrepreneurial, the ecosystem's leadership, strategy, and management should promote economic growth, greater clarity of the pedagogical offering towards enterprise, involve key stakeholders with enterprising identified, and evidence practical value across the institution (Murray & Crammond, 2020; Murray et al., 2018).

There is a tremendous opportunity for the growth of EE through sustainable academic teams within HEIs. Although it already exists in differing degrees across higher education, connecting the enterprising competencies of students, quality of new venture creation start-ups, and social outlooks to entrepreneurship are varied. Now society faces unique challenges and opportunities that have amplified the benefits of EE.

Concerns about embedding EE have become the enduring topics of discussion amongst scholars, emphasising development of the enterprising skills and attitudes of student entrepreneurs (Murray & Crammond, 2020; Murray et al., 2018; Omeihe & Omeihe, 2021). Similarly, there have been challenges with embedding EE within HEIs, such as a lack of follow-up support for new ventures, a lack of relevant infrastructure, funding deficits, a lack of industrial experience, and most impactful, the unwillingness of students to venture into business creation (Crammond, 2020; Steira & Steinmo, 2021).

Therefore, a teams' approach, whether it is by teaching teams or by encouraging student groups in course or assessment settings, offers a distinct style to EE within an academic context (Crammond, 2020; Jin et al., 2017; Karlsson & Nowell, 2021). Progressing numerous studies concerning the perspectives of the individual educator, programmes, or institutions (Bliemel & Monicolini, 2020; Crammond, 2020;

Kuckertz, 2021; Walter & Block, 2016), implementing this approach can increase the rate of new venture success as entrepreneurial competencies of the team complement each other and re-evaluate the educational and entrepreneurial offering. Scholarship on entrepreneurial teams with HEIs has shown varied outcomes (Backs et al., 2019; D'Hont et al., 2016); hence further research is necessary to uncover the true nature across contexts and concerning both student groups and academic partnerships. Essentially, the ongoing progression of EE through a team-based approach requires the pedagogical, social, and strategic factors discussed here.

Pertinent themes emerge from the literature. These include the importance of key enterprising offerings either through taught or training/developmental opportunities, stakeholder engagement, and identity, and ensuring that resources and activities add significant value.

The context investigated and survey questions are discussed next in this chapter, addressing these themes and the chapter's core questions. Table 1, within the next section, lists the various questions, as categorised against each core question and relevant theme identified.

Table 1 Survey questions

Statement	Core question (1 or 2) and associated theme
1 <i>Entrepreneurship Education courses should be delivered within all degree courses at the Higher Education level.</i>	2—The Offering
2 <i>Courses delivering Enterprise Education in Higher Education must involve real-world experience of entrepreneurship.</i>	1—Archetypes
3 <i>In your opinion, there is a shortage of academic staff in Higher Education with experience of entrepreneurship and small business.</i>	1—Experience
4 <i>Networking with current entrepreneurs during a degree course would significantly increase entrepreneurial intentions and activity.</i>	1—Ecosystem
5 <i>From your experience of further and/or higher education, they adopt contemporary technologies, which positively add to the learning experience.</i>	2—Learning Tools
6 <i>Courses can offer such enterprising teaching methods; however, a lack of exposure to enterprise limits the experience.</i>	2—Relevancy
7 <i>Courses or educators without introducing or possessing relevant small business and entrepreneurial experience can still effectively deliver EE-relevant courses.</i>	1—Real-world Experience
8 <i>There are cross-discipline courses, relevant to entrepreneurship education, currently being delivered within the university.</i>	2—Interdisciplinary
9 <i>The university offers current students many opportunities to network with industry and organisations related to new venture creation.</i>	2—Networking
10 <i>You believe that small business owners and entrepreneurs should network with the university more regularly.</i>	1—Engagement

3 Context

Witnessing significant change of late and a renewed emphasis on enterprise activity, this chapter focusses on the recently formed Enterprise Team of academics within the University of the West of Scotland (UWS). A modern and international institution known for its commitment to industry-relevant education and preparing students for the world of work, UWS consists of five campuses in Ayr, Dumfries, Lanarkshire, London, and Paisley.

The enterprise team primarily involves senior lecturers and lecturers of enterprise, but also business advisors working closely with central university departments and current entrepreneurs who are involved with teaching responsibility. The team, with the aim of delivering enterprise courses and encouraging entrepreneurial activity during and after graduation, has introduced a number of initiatives: the ‘ring-fencing’ of enterprise courses across all levels; the creation of a research group; a student society focussing on business and entrepreneurship; a discussion series of presentations; and, the annual enterprise competition open to students, staff, and alumni.

The following four courses, all delivered by the enterprise team, are the focus of this study. These have also been selected as they represent the newly-formed suite of successive modules from first year to honours year (fourth year) of the current undergraduate, enterprise-specific, or related business offering within UWS.

Leadership and Management Skills (First Year) is an optional course, offered to students across the business, human resource management, finance, and events management programmes. The purpose of this course is to introduce concepts of leadership and management, as well as enable students to undertake practical exercises to develop skills for the workplace. *Entrepreneurial Opportunity* (First Year) is also an optional course. The purpose of the course is to provide students with an introduction to enterprise. It offers students the chance to identify business opportunities using environmental scanning tools. *Business Acceleration* (Second Year) is a 6-week course focussing on the development of a business idea through the use of market tools and enterprise resources. This included adopting the Business Model Canvas and Market Test tool within groups. A reflection of relevant skills and appreciating market factors towards a business idea form the assessment strategy of this course (Walter and Block, 2016; Kuckertz, 2021). Finally, the *Enterprise Creation* (Third Year) course is the largest enterprise course within the university. The assessment involves the creation of a group business plan, along with organising and preparing towards the defence of a business idea using digital marketing tools and platforms. This pitch occurs at the end of the course, with student groups presenting before an expert panel of academics and external stakeholders.

The methodology adopted follows an exploratory mixed-method design, involving these four undergraduate courses, with students enrolled in these courses being invited to participate.

Exploratory and sequential in nature, the study first reflects on qualitative findings from students enrolled in the four courses, followed by a Likert-scale survey

distributed to staff and students. This provides a breadth and richness of data, involving a number of participants from both sides of the '*learner-educator contract*' and across academic levels. The qualitative findings are collected via course experiences and provide an opportunity to reflect on what students encountered within their respective courses. Subsequently, the Likert-scale survey includes strongly disagree to strongly agree response options, coded from 1 to 5, respectively, to ten questions (Table 1) concerning an entrepreneurial university's approach to EE, including delivery, design, and use of technology to name a few, which rely on a team-based response. These are linked to the core questions, as per relevant theme encountered in the review of relevant literature in this chapter.

A sample of over 250 enrolled students from across the four courses were invited to participate in the survey, along with the academic staff. In total, 136 (54%) participants responded. All students who responded were enrolled in one or more of the courses listed. Qualitative findings through module feedback, found in the following section, highlighted a number of perspectives from students, which further respond to the core questions of this chapter.

4 Findings and Discussion

As a result of recent module reviews and the establishment of an enterprise stream by the academic team, all four courses facilitate the development of crucial entrepreneurial competencies such as idea generation, team-building skills, leadership and management traits, and increased engagement with their local business network (Gianiodis & Meek, 2020; Ilonen, 2021). The courses adopt renewed pedagogical approaches, which contribute to a re-evaluation of the taught field related to EE, combining the abilities of academic staff, digital and practical resources and materials, which aim to empower students and enable an interactive, student-centric educational experience (D'Hont et al., 2016).

Tables 2 and 3 display the survey results for the ten questions posed.

Concerning the first question of this chapter, '*How do students perceive a team-based approach concerning enterprise education?*', feedback from students enrolled onto the courses noted that the weekly sessions '*kept everything fun*', with the student team or group-based nature of the courses formative and summative

Table 2 Survey respondent details

	Age (%)	Occupation	
18–24	50% (68)	Student	64.1% (87)
25–30	10.9% (15)	Staff	16.3% (22)
31–40	20.7% (28)	Business Support	2.2% (3)
41–50	10.9% (15)	Entrepreneur	4.4% (6)
51–60	5.4% (7)	Alumni	13% (18)
61+	2.2% (3)		
Total	100% (136)	Total	100% (136)

Table 3 Survey results (*n* = 136)

Statement	Mean <i>m</i>	Strongly disagree (1)	Disagree (2)	N/A/ cannot say (3)	Agree (4)	Strongly agree (5)
		%	%	%	%	%
1 <i>Entrepreneurship Education courses should be delivered within all degree courses at the Higher Education level.</i>	4.04	3.3	4.3	19.6	30.4	42.4
2 <i>Courses delivering Enterprise Education in Higher Education must involve real-world experience of entrepreneurship.</i>	4.37	2.2	1.1	9.8	31.5	55.4
3 <i>In your opinion, there is a shortage of academic staff in Higher Education with experience of entrepreneurship and small business.</i>	3.58	1.1	12	37	28.3	21.7
4 <i>Networking with current entrepreneurs during a degree course would significantly increase entrepreneurial intentions and activity.</i>	4.41	1.1	3.3	13	18.5	64.1
5 <i>From your experience of further and/or higher education, they adopt contemporary technologies, which positively add to the learning experience.</i>	3.87	1.1	5.4	23.9	44.6	25
6 <i>Courses can offer such enterprising teaching methods; however, a lack of exposure to enterprise limits the experience.</i>	3.89	4.3	5.4	20.7	35.9	33.7
7 <i>Courses or educators without introducing or possessing relevant small business and entrepreneurial experience can still effectively deliver EE-relevant courses.</i>	3.63	1.1	9.8	32.6	38	18.5
8 <i>There are cross-discipline courses, relevant to entrepreneurship education, currently being delivered within the university.</i>	3.43	3.3	7.6	46.7	27.2	15.2

(continued)

Table 3 (continued)

Statement	Mean <i>m</i>	Strongly disagree (1)	Disagree (2)	N/A/ cannot say (3)	Agree (4)	Strongly agree (5)
		%	%	%	%	%
9 <i>The university offers current students many opportunities to network with industry and organisations related to new venture creation.</i>	3.08	8.7	26.1	29.3	20.7	15.2
10 <i>You believe that small business owners and entrepreneurs should network with the university more regularly.</i>	4.5	0	2.2	10.9	21.7	65.2

assessments and activities allowed for ‘everyone [to get] involved’. The majority of survey respondents agreed that EE should be offered within all degree courses at the HEI level ($m = 4.04$) and must involve real-world experience (4.37).

Comments also included that encouraging students to engage, in teams, with enterprise amongst other more traditional forms of business education enabled them to get ‘out of [their] comfort zone’ and resulted in them ‘communicating with others’. Additionally, the survey showed that they are cognisant of the importance of networking (4.41) and the building of enterprising legacies and entrepreneurial ecosystems through engagement with the Enterprise Team and local and national industry (4.5). Although courses were online based in workshop and drop-in scenarios, with students finding this difficult at times, students stated that the business process outlined by the Enterprise Team was very ‘detailed and informative’, which was ‘engaging’.

With regard to the second question, ‘What are the types of institutional activities and range of digital platforms needed for quality enterprise pedagogy, going forward?’, core educational content is hosted through versatile virtual learning platforms (Aula, Moodle, and Google) that allows the Enterprise Team to customise and communicate learning cognisant to their field, industry, and students’ expectations. These provided theoretical content that was ‘related to real life examples’. Notably, students expressed how the teaching teams within these courses brought about a ‘wealth of experience and knowledge’. Also noted was that respondents regard a lack of exposure to enterprise, with a simply didactic approach being adopted, for example, limiting the experience (3.89). The courses are regarded as diverse and include themes of creativity and business planning. These have been embedded through many activities within the curriculum. However, there was some uncertainty concerning the surrounding opportunities available (3.08). This may further vindicate the importance of this new academic team approach towards enterprise within the university, evidencing both skills and experience.

The findings of this study indicate, in summary, that students reacted positively to the courses offered and developed key entrepreneurial skills across the varied forms of assessment. However, it is possible that many have been unaware of how these skills can be evidenced further within the university community and beyond.

Acknowledging the findings of this chapter aids in a greater understanding of the successes, or further areas to consider, of the team-based approach. The academic team, similar to many who facilitate EE, realised a strengthened approach to the teaching and support of enterprise (Crammond, 2020). This allows a conceptualisation of this team-based perspective, through the prism of institutional change, and academic leadership, in aiming to build a legacy for entrepreneurial outcomes (Murray & Crammond, 2020; Walter & Block, 2016; Winkler et al., 2018).

Therefore, the chapter's *Team-Based Re-Evaluation Model for EE* (Fig. 1) is presented towards prescribing a revised approach that is considerate of critical pedagogical, practical, and personnel factors. It extends to a greater understanding of previous understandings of the university delivery and thematically emphasises how a team-based approach in delivering EE, through archetypal EE-relevant individuals, can be established and maintained, shaping activities.

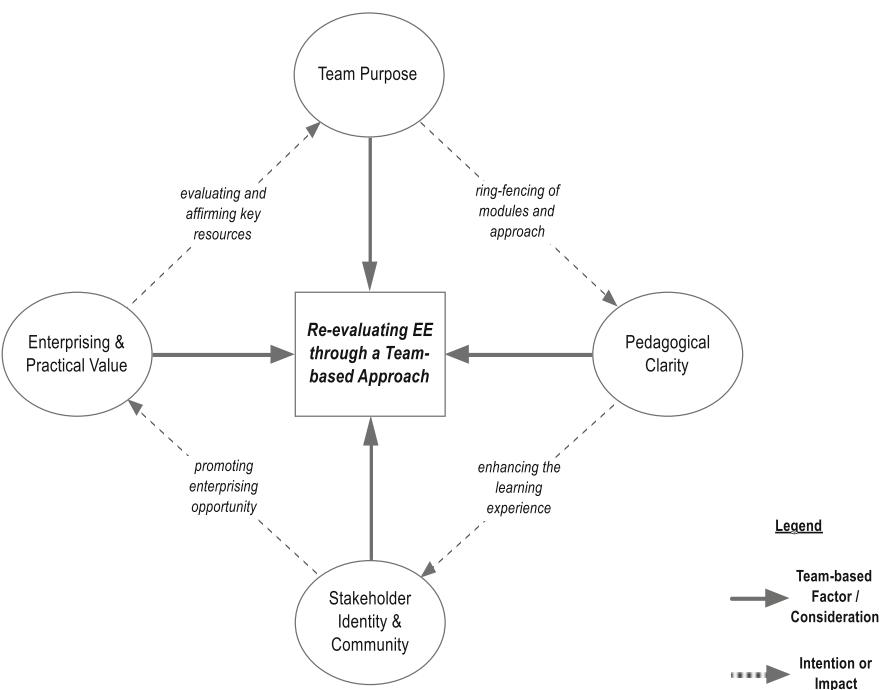


Fig. 1 Team-based re-evaluation model for EE

4.1 Team Purpose

The feedback and survey both indicate that students reacted positively to the team-based nature of courses and the team-based support. However, students are unclear on the wider university community (Questions 3 and 9) as greater involvement of those across academic and industry also adds to the enterprising environment. The presence of such enterprising teams for EE, as the empirical evidence suggests, increases visibility of the university's enterprise message and strengthens the link between educators, students, and engaging industry partners.

4.2 Pedagogical Clarity

Students agree that enterprise should be embedded within programmes across the offering (Questions 1 and 2). The grouping of relevant courses, under the control of the team, is fundamental in clarifying the nature of the course delivered and how it assists in a student's entrepreneurial journey. Drawing on practical and experiential pedagogies in EE, such as group and reflective tasks, increases its applicability to diverse contexts through varied subject areas.

4.3 Stakeholder Identity and Community

A third factor of this model is the enhancement of the course delivery through stakeholder engagement, embracing an existing or emerging enterprise culture within the university, and building a productive community. As this chapter's results indicate, these factors encourage enterprising behaviour and raise entrepreneurial intentions. Additionally, wider stakeholder involvement encourages legacy building and reinforces the enterprise message.

4.4 Enterprising and Practical Value

The final factor alludes to how EE must be team-led, with a focus on consistently possessing both enterprising and practice value. Forms of EE are inclusive and extend beyond the boundaries of new venture creation to include required competency development and ways in which students, nascent entrepreneurs, and alumni can contribute to an economy (Questions 5–7). This specific case within this chapter documents the many additional initiatives such as a student society, competition, and discussion series group, which provide additional opportunities surrounding formal, higher education.

The model itself outlines key factors and considerations that impact university resources and its vision (Crammond, 2020; Walter & Block, 2016). A re-evaluation of team-based approaches to EE, as the model displays, results in an awareness of the strengths of the university offering and aims to bring together various elements of the university experience for staff and students: knowledge acquisition, collaboration, external engagement, and societal impact. This model and the chapter result in several implications and recommendations for EE practice and the institution.

5 Conclusions and Recommendations

This chapter has considered, through a contextual example of a recently-formed team for EE within a Scottish University, a number of pedagogical and sociological perspectives.

How Do Students Perceive a Team-Based Approach Concerning EE?

Students enrolled in the courses enjoyed the enterprising experiences and benefitted from the wider enterprise team and new offerings. They were alerted to the wider community, the importance of the industry or entrepreneurial stakeholder, and surrounding opportunities outwith the classroom.

The findings from this chapter bring into focus the critical importance of entrepreneurially minded individuals who provide a well-rounded experience of enterprise.

What Are the Types of Institutional Activities and Range of Digital Platforms Needed for Quality Enterprise Pedagogy, Going Forward?

The activities mentioned, such as the practical assessment, student society work, and competitions, and externally-supported events all emphasise the enterprise experience and have seen an increase in entrepreneurial intention amongst the students of UWS. Academics with experience in educational tools and methods, which have included business scenarios and simulation, strategic planning, and digital marketing training, impacts course experiences. The courses evidence the progression of conceptual understandings of enterprise, leadership, and management to more enterprise-specific and practice-based activities.

The re-evaluation model consolidates the deduced themes from the literature and the empirical findings of this chapter, presenting several implications for related EE practice and policy from *pedagogical*, *philosophical*, and *sociological* perspectives.

Pedagogically, this model should alert educators and teams delivering EE on how they can enhance the institutional offering. What content is relevant, and which approaches should be adopted throughout a programme structure, as students progress year on year? Does the suite of courses develop leadership and entrepreneurial competencies and alert students to EE-relevant societal issues such as business growth and sustainability?

Philosophically, the re-evaluation model also acknowledges the forces within and out of the university, such as institutional culture and external stakeholders, which impact the nature of EE offered. Who is required within this team-based approach?

Would this immerse and promote key enterprising ideals such as autonomy, liberation, and creativity?

Finally, *sociologically*, this chapter underlines that a strong and unified message for enterprise, representative of a team, encourages and maintains an enterprising community. Evidence here indicates that a universal outlook to enterprise, which engages with all corners of the university, widens the reach for enterprise and aids in the building of an entrepreneurial legacy. Therefore, what initiatives would add value? Where does these initiatives align or complement the university's broader strategy?

In response to evident institutional change concerning EE, or global factors such as the pandemic, a unified approach such as the practical model prescribed here is of valuable use in reviewing EE-related resources, capabilities, and strategies existing within today's advancing, entrepreneurial universities.

6 Limitations

The researched context within this study focusses on four selected cases within a single university. There is an opportunity for further investigation of the team-based approach for EE, through the adoption of similar methodologies, or alternatively through longitudinal case studies, action research (Winkler et al., 2018), or additional statistical analysis. Furthermore, there is an opportunity, unlike this chapter's approach, to undertake a comparative study across universities to witness and understand institutional changes and impacts in action.

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Coaching Concept to Improve the Sustainability Impact of Students' Startup Ideas in an Early Stage



Philipp Preiss, Katja Puteanus-Birkenbach, and Claus Lang-Koetz

Abstract As part of entrepreneurship education, since 2018 the “Startup Summer Camp” with a focus on “Sustainable Innovation” is offered at Pforzheim University. This Startup Summer Camp is designed to enable students to develop a sustainable oriented business model within 6 days. Hence, lectures and impulses on the goals of sustainable development are given. Methods for sustainability impact assessment are taught and the students are then guided through applying them on a specific innovation idea. These elements are part of the coaching concept developed.

This chapter describes the coaching concept and presents the results of a survey regarding the effectiveness of coaching on sustainability aspects. Therefore, the following two research questions are to be answered within this study:

- How aware are the students of sustainability issues and can their level of knowledge regarding sustainability topics be increased with the coaching?
- Are the students able to design their startup idea in a more sustainable way and/or estimate the level of the impact on sustainability?

The results of the survey show that within a very compact coaching session, an important and applicable understanding of the complexity and urgency of sustainable development can be created and applied to an innovation idea.

Keywords Entrepreneurship education · Startup · Sustainability

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1 Introduction

Entrepreneurship is primarily known for achieving economic benefits. The term entrepreneurship originally comes from the French word “entreprendre,” which means “to undertake something” or “to take into one’s own hands” (Fueglstaller et al., 2016). The “megatrend of sustainability” (Zukunftsinstitut, 2018), in terms of environmental and social aspects as pressing issues affecting the current global system, points out that entrepreneurship should not only be based on the creation of economic wealth. This has led to the emergence of the concept of “sustainable entrepreneurship,” which has gained a lot of attention in recent years (Terán-Yépez et al., 2020).

Evaluating and selecting business or innovation ideas is an important part of startup processes. In addition to traditional aspects such as implantation effort and market attractiveness, the potential impact on different aspects, especially environmental aspects such as climate change or biodiversity loss, but also social aspects such as impacts on jobs and health, should be considered at an early stage. Hence, the Green Startup Monitor 2022 (Fichter & Olteanu, 2022) illustrates the importance and potential of green startups. *“Achieving a positive social or environmental impact is important to more than three quarters of startups in Germany. Just under a third are already making targeted and active contributions to the 17 Sustainable Development Goals (SDGs) of the United Nations. Green start-ups now form a significant part of the start-up scene and innovation activity in Germany.”* These concerns are gaining attention in the context of sustainable development and the United Nations Sustainable Development Goals (SDGs). Startups are a key driver of change in the economy (Fichter & Olteanu, 2021). They can help to implement the politically set sustainability goals. The 17 SDGs (EC, 2017) are to be achieved by 2030. Technological progress opens up new opportunities. At the same time, our experience shows that the mega-trend of sustainability motivates many students to act.

In this context, connecting sustainable development and entrepreneurship education plays an important role. This is also shown in the literature: the importance of sustainability awareness is mentioned (Hsu & Pivec, 2021) and adding sustainability to entrepreneurship education has been called for (Amatucci et al., 2013). There seem to be links between sustainability education and entrepreneurs’ attitudes (Lourenço et al., 2013) and in general, the importance of training in sustainable entrepreneurship is mentioned (Kummitha & Kummitha, 2021). In a European research project, training units for green venturing were developed, which can help students solve innovation challenges (Hjelm et al., 2022).

However, the question is how sustainability issues can be integrated into existing entrepreneurship education formats and what impact can be achieved. Hence, the following two research questions were addressed within our study:

- How aware are the students of sustainability issues and can their level of knowledge regarding sustainability topics be increased with the coaching?
- Are the students able to design their startup idea in a more sustainable way and/or estimate the level of the impact on sustainability?

These questions are addressed in a specific entrepreneurship education format, the so-called “Startup Summer Camp Sustainable Innovation” (cf. Preiss et al., 2022), which was offered in 2021 for the fourth time in cooperation with the “GründerWERK—Centre for Entrepreneurship at Pforzheim University” and the Institute for Industrial Ecology (INEC) at Pforzheim University.

The term “Sustainable Innovation” is used because not only economic success is the aim of the innovation but also ecological and social aspects are considered. To find a unique definition of “Sustainable Innovation” is difficult. A reason may be the fact that researchers from many different disciplines have picked up this and similar topics (Boons & Lüdeke-Freund, 2013). However, for example, Tello and Yoon (2008) defined sustainable innovation as *“the development of new products, processes, services and technologies that contribute to the development and well-being of human needs and institutions while respecting natural resources and regeneration capacities.”*

Our coaching concept was developed to enhance conventional entrepreneurship education formats from a sustainability perspective. This is demonstrated in the summer camp sustainable innovation, which has been held at Pforzheim University every September since 2018. The summer camp is intended to enable students to develop a business model within a 6 days full-time course (from 9 am to 6 pm). For the students, the objective is to be enabled to create a more sustainable startup idea by conducting an approximately eight-hour training session on the topic of creating a sustainable startup idea within this week. Hence, the students did not work on the technological aspects of their innovations in depth. The startup ideas have been relatively pre-mature in the past. However, if more mature startup ideas come along, we are also prepared to provide input, e.g., from the staff at Pforzheim University.

The aim of the impact evaluation described in this chapter is to evaluate the effectiveness of the sustainability coaching concept, to reconsider the design of the concept, and to subsequently improve the sustainable entrepreneur education measures.

2 Coaching Concept

The core objective of the summer camp is that students should be able to use the “Design Thinking” method (Uebenickel et al., 2015) to design a business idea and a business model for a business project.

The schedule for the whole week is illustrated in Fig. 1. It starts at 9 am in the morning and ends at 6 pm in the evening with additional “after-work events” such as a founder talk or a keynote on sustainable art, etc.

At the end of the course, the students should be able to design a business model correctly, write it down in a “Business Model Canvas” (Osterwalder & Pigneur, 2011) and present it professionally in a team in front of a jury of experts. This gives the students insights into various concepts and tools.

... START. TRY. FLY!					
Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
Research	Design Thinking	Value Proposition	Lean Startup 2	Lean Startup 3	How To Pitch
... Lunch Breaks ...					
Teambuilding	Sustainable Inno. 1	Lean Startup 1	Sustainable Inno. 2	Business Model	Final Pitch
6pm closing remarks or alternative programs such as founder talks. Saturday: Award Ceremony					

Fig. 1 Schedule of the startup summer camp sustainable innovation (GründerWERK, 2019)

The teaching and learning concept is characterized by an action-oriented (action learning) 6-day summer camp. The curriculum starts with team building. The UN sustainable development goals are used as a starting point for the development of ideas. Through short keynote speeches by the lecturers, the students are led from basic knowledge to detailed knowledge and, in the final product, to a modified “Business Model Canvas” with detailed comments. This “Business Model Canvas” is iteratively adapted in the follow-up period through research and initial prototype market tests with explanatory comments.

The focus of the summer camp lies on “Sustainable Innovation.” Hence, lectures and impulses on the goals of sustainable development are given in addition. A main focus is the integration of life cycle assessment (Rebitzer et al., 2004; ISO 14040, 2006; Hauschild et al., 2018), assessment of social aspects, estimation of the contribution regarding SDGs, life cycle thinking (Life Cycle Initiative, 2021), and eco-design [see, e.g., DIN SPEC 59 (2010), Brezet and van Hemel (1997), and Tischner et al. (2000)]. This gives the students the opportunity to learn about how to regard sustainability impact, experiment with the theme, and develop their own “sustainable business idea.” To support the impulse lectures and the subsequent exercises, a guidebook was created (Preiss et al., 2022) and provided together with other working material as a handout. The evaluation tool “Green Check Your Idea” (Lang-Koetz et al., 2020) is presented and applied in parts to the students’ ideas.¹ This is used to convey an understanding of the complexity of the emergence of environmental impact, taking into account the complete life cycle.

The sustainability coaching concept developed² comprises four blocks (see Fig. 2) that can be carried out in a period of about 8 h. At the summer camp, these are distributed to the second and the fourth day (see Fig. 1). It is based on a roughly developed startup idea that is then to be considered from a sustainability perspective. For this, small groups (up to approx. six people are suitable) work together on an idea. The blocks of the coaching concept will be described in the following.

The coarse analysis consists of two blocks: First, an introduction to sustainable innovation is given by providing knowledge on the topics of sustainability and Life Cycle Thinking. Approaches to sustainability management including assessment methods and typical implementation measures are presented. The stakeholder analysis is introduced as a method (Bourne & Walker, 2005). The students carry out an initial stakeholder analysis of the innovation idea they have developed. This is done with the help of a worksheet.³ This includes the five most important stakeholders

¹The tool can be used free of charge at the website <https://www.green-check-your-idea.com> (last access: 08.06.2022).

²An intermediate status of the coaching concept was presented by Annika Reischl at the “G-Forum Conference 2020” (Reischl et al., 2020). In the meantime, feedback from students and further improvements have been implemented (Preiss et al., 2022).

³The worksheets are available for download at https://www.hs-pforzheim.de/studium/im_studium/design_factory/nachhaltigkeitscoaching

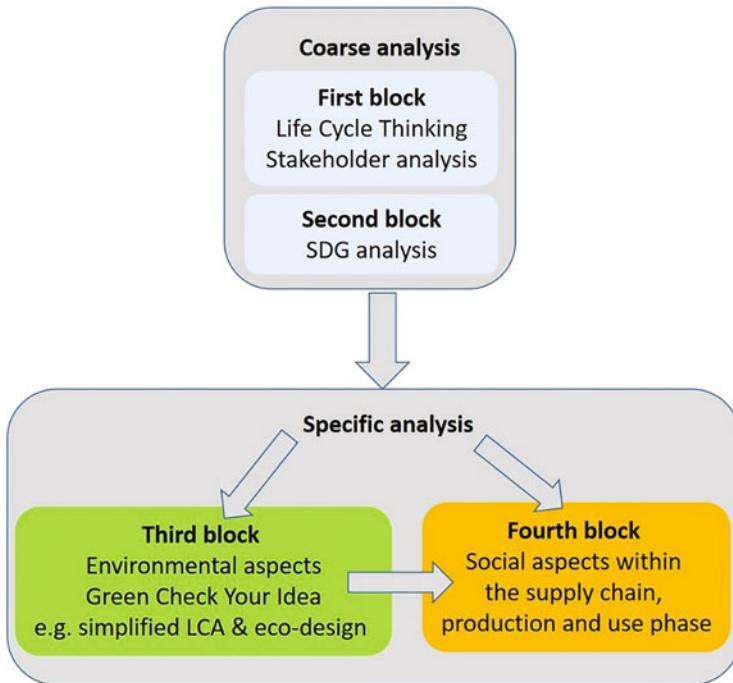


Fig. 2 Overview of the blocks of the coaching concept (based on Reischl et al. (2020))

with their interests, impacts, and interactions on the startup idea as well as strategies for dealing with them.

In the second block of the course analysis, different perspectives of sustainability are shown and the United Nations Sustainable Development Goals (SDGs) are presented. The students are introduced to the SDGs in different ways. First, they play a card game (EDA, 2017), where comparisons are made between different countries and for different SDGs. The participants were also inspired by contributions to “Art & Sustainability,” a special presentation of the SDGs with artwork on 17 posters developed by Adis Ahmetasevic, a student of visual communication at Pforzheim University. In addition, informational posters with an overview of the individual SDGs and selected facts and indicators are shown. The participants then have to identify three goals that are most relevant to their own startup idea. With the help of a further worksheet, the identified goals, the relation to the idea, and possible positive and negative effects of the idea on the respective SDG are documented. This also creates awareness of the fact that there are often trade-offs between economic, ecological, and social aspects.

The specific analysis consists of blocks 3 and 4 of the coaching: The third block addresses the ecological aspects of the innovation idea.⁴ First, the foundations of life cycle thinking (Life Cycle Initiative, 2021) and life cycle assessment (ISO 14040, 2006) are presented to the students. With the help of worksheets and the handout (Preiss et al., 2022), the participants finally carry out the steps of a life cycle assessment for their own startup idea, as far as this is possible: Process steps of resource supply, manufacturing, or logistics processes are determined and described on the corresponding worksheet. The next step is to identify inputs (e.g., raw materials, operating materials, or energy consumption) for the processes as well as outputs (e.g., product output, scrap, waste, emissions to air) from these. In this first analysis, qualitative data often has to suffice, whereas quantitative data should be used when available. Checklists and examples support the participants (Preiss et al., 2022). Finally, guiding questions are used to draw attention to potential environmental impacts, which serve to uncover hotspots in the life cycle of one's own idea.

In the next step, awareness is raised on how to immediately or continuously improve the sustainability performance of the startup idea in a very pragmatic way: Principles of eco-design for the most environmentally friendly product development are presented [see e.g. DIN SPEC 59 (2010), Brezet and van Hemel (1997), and Tischner et al. (2000)]. In Fig. 3, there is an example of recommended eco-design principles displayed.

Participants then receive a set of cards with eco-design principles assigned to the different life cycle phases. On each card, one principle is explained. The teams read through the cards and select three relevant principles for their own startup idea. These are finally documented on a worksheet. In a group discussion, they determine how these principles can be applied to their own startup idea and get feedback from the coaches.

Finally, the fourth block of the coaching concept takes a closer look at the social effects of the startup idea regarding the upstream processes of the supply chain or the product use. Foundations and methods for evaluating social impacts according to the "Product Social Impact Assessment" (PSIA-methodology) (Goedkoop et al., 2018) are presented. The participants then carry out a simplified social impact analysis regarding their startup idea. On a further worksheet template, they have to reconsider already collected data regarding important life cycle stages and allocate relevant stakeholders to it. The students have to conduct their assessment based on information from a quick Internet research and "expert guesses." They then choose the most relevant social topics, derive performance indicators, and determine a corresponding reference scale based on the checklists from Goedkoop et al. (2018). Finally, the students are asked to discuss and review potential improvement measures to increase the reference scales, if possible.

⁴The approach and methodology of this third block of coaching was discussed and tested with startups and larger companies and implemented in the online tool "Green Check Your Idea" (Lang-Koetz et al., 2020).

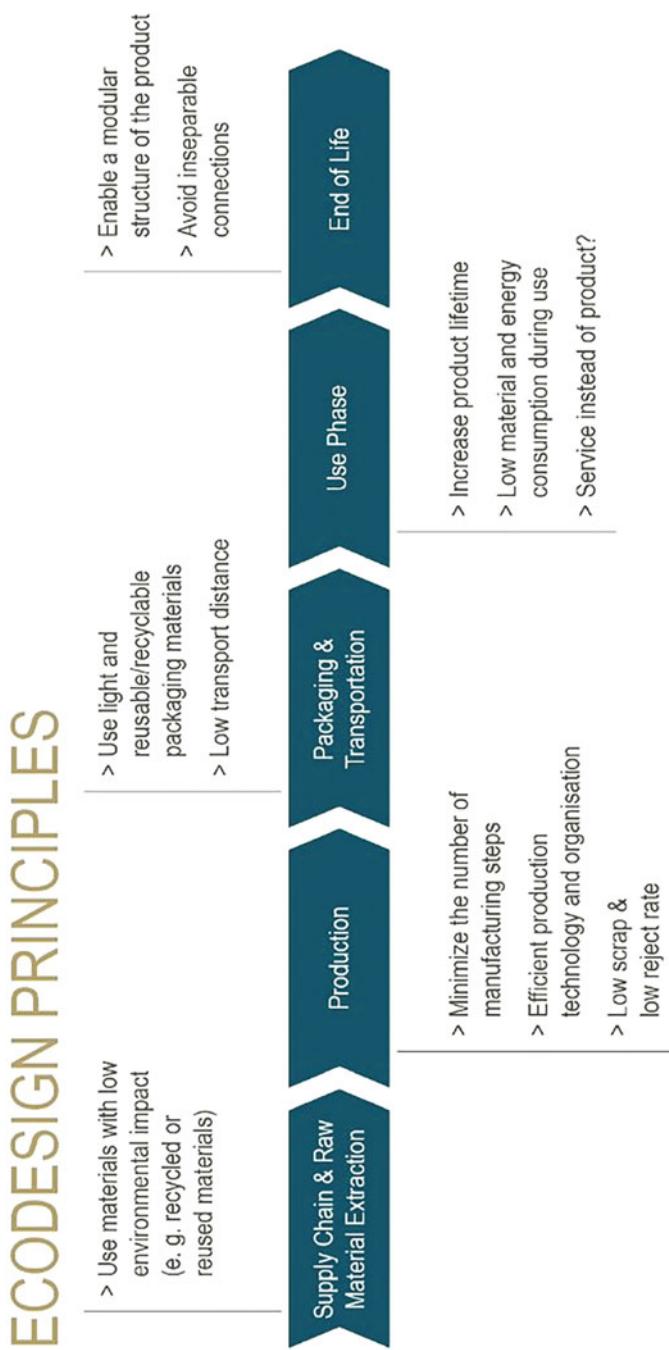


Fig. 3 Example of recommended eco-design principles (Umwelttechnik BW GmbH & INEC, 2019)

3 Method

3.1 Application of the Sustainability Coaching Concept

The sustainability coaching concept was applied in the undergraduate course “Startup Summer Camp Sustainable Innovation” at Pforzheim University. The course is open to students from all bachelor programs (from the Design School, Engineering School and Business School) and Bachelor's, as well as Master's students. The students have to apply by handing in a letter of motivation and a short description of their own business idea as well as a CV. Participants are then selected by assessing the quality of the business idea description and the sustainability and innovation potential of the submitted business idea. Furthermore, the composition of the students should enable interdisciplinary collaboration by a mix of faculty/program affiliation, age, and master's as well as bachelor's degree programs. During the week the activities include team building, design thinking, and the concept of lean startup. At the end, the students receive pitch training so that they present their idea to a jury consisting of professors, startups, and entrepreneurs. In and after the course, the students will be able to use the framework method Design Thinking to design a business idea and a business model for a sustainable business project in a reasonable way in terms of content and to coordinate the individual components, write it down formally in a Business Model Canvas, and pitch it professionally in a team in front of a jury of experts.

The application of the methods from the individual blocks of the sustainability coaching concept took place in groups with up to six students. At the end of each block, the results were presented to other participants in the context of peer feedback and discussed together. After the “coarse analysis” (first and second blocks), it is possible that the participants have discovered a particular relevance of ecological or social aspects, depending on the type of startup idea. Therefore, a special focus could be placed on ecological or social aspects during the specific analysis (third and fourth blocks).

Coaches and Lecturers

The teaching and learning concept is characterized by an action-oriented (action learning) approach. The starting point is the students' own startup ideas. The six most interesting ideas are followed up. The selected ideas are developed from basic knowledge to detailed knowledge through the short lectures of the instructors. On the one hand, there is a team of five coaches who are permanently on-site. These coaches also provide input presentations and lectures, e.g., on design thinking and sustainability assessment. There are also additional keynotes, e.g., on financing a startup, and a final team coaching to refine the business model with another seven special external experts, e.g., from professional management units.

In 2021, only 20 students could be accompanied in presence at the location of the GründerWERK in Pforzheim (due to the Covid pandemic). In the previous year, 30 students participated. The study programs of the students ranged from mechanical engineering, different degree courses of the Design School, to degree courses in

Table 1 List of startup ideas developed by the students

Group	Participants	Startup idea
1	2	Consulting regarding environmental issues for small companies
2	2	Highly efficient and local natural cosmetics
3	4	Urban community garden
4	5	Fitness training based on electromagnets
5	3	Device to recycle filaments from and for 3D printing
6	4	Popup-workshop to make people, and especially pupils, aware of the options to repair or recycle things instead of disposing of them

business administration, e.g., with a focus on resource efficiency management or life cycle and sustainability. Hence, as intended, a quite interdisciplinary group of students could work together.

The 20 students arranged themselves into six groups. The startup ideas are depicted in Table 1.

3.2 Assess the Impact of Sustainability Coaching on Students' Sustainability Knowledge, Awareness, and Attitudes

Based on the coaching concept for improving the sustainability of startup ideas described above, a survey with a questionnaire to evaluate the evolution of the “impact” on the students on knowledge, awareness, and attitude has been conducted. The survey was developed along the lines of the “evaluation of training programs” by Kirkpatrick and Kirkpatrick (2006). Before and after the coaching, the students were asked for concrete factual knowledge. After the coaching, in addition, the students were asked whether they liked the coaching and the different methods.

First, we conducted a survey at the very beginning of the week of the startup summer camp in order to have the “reference status quo” of knowledge and awareness of different sustainability aspects.

As described above, the students listened to several impulse lectures and applied and practiced the knowledge obtained in the course: The students had to apply the information in different group exercises and discussions in order to raise awareness and apply the findings to their startup idea. At the end of the startup summer camp, we repeated the survey in order to have a new status of knowledge and awareness on different sustainability aspects. We also repeated the survey after 3 months again to check how long-lasting the effect of the coaching was.

The questions posed are listed in Table 2. They are distinguished into questions (a) reflecting on the motivation to participate to the startup camp with a focus on sustainable innovation, (b) reflecting on basic knowledge about sustainability, and (c) revealing the knowledge regarding different topics of the keynotes during the lecture by a self-assessment.

Table 2 List of questions

(a) Self-assessment—reflecting the motivation to participate to the “Startup Summer Camp—Sustainable Innovation”
Can you imagine founding a startup?
Can you imagine founding a startup in the next 3 years?
What is the importance of sustainability for your startup idea?
(b) Questions on basic knowledge about sustainability
How many Sustainable Development Goals (SDGs) are there?
In which year should these Sustainable Development Goals be achieved?
(c) Self-assessment on different relevant sustainability topics
The following questions ask for a self-assessment on a scale between zero and five, whereas <i>zero means “I have no idea” and five means “I am an expert in this topic”</i>
How would you rate your knowledge of sustainability in startups?
How would you rate your knowledge of Eco-Design?
How would you rate your knowledge of social sustainability?
How would you rate your knowledge of life cycle assessment?
How would you rate your knowledge of Sustainable Development Goals?

4 Results

4.1 Results of the Impact Evaluation of the Coaching Concept on Knowledge, Awareness, and Attitude of the Students

The results of the impact evaluation are based on the responses of the participants. While all 20 participants responded to our questionnaire at the beginning, 18 participants responded at the end of the week. However, 3 months after the summer camp, only eight students answered the questionnaire. In the following tables and figures, the results for each questionnaire are normalized and expressed as a percentage of the participants. Therefore, the results for the questionnaire after 3 months have to be interpreted with caution.

With the first part of the questionnaire, we are asking for the motivation of the participants. The statements about whether or not they can imagine founding a startup—in general or, within the next 3 years, respectively—are listed in Table 3.

The results in Table 3 show that the participants of the startup camp are quite motivated to found a startup. Moreover, it is notable that the commitment even increased after the coaching week. The commitment of the participants after 3 months is much lower, if “no response” also means “no commitment.” Only 8 out of the 20 students answered this questionnaire. Therefore, assuming the 12 who did not answer may have lost their interest in founding a startup, the share of students still determined to found a startup has decreased considerably, i.e., only five or six out of 20 still express their commitment to found a startup.

In Fig. 4, the answers to the question, “What is the importance of sustainability for your startup idea?” are displayed. There are three answer alternatives—in

Table 3 Results on the question of whether or not the students can imagine founding a startup “sometimes”, and more concrete, within the next 3 years

n = 20	Yes (%)	Maybe (%)	No (%)	No response (%)
<i>Can you imagine founding a startup?</i>				
Before coaching	80	20	0	0
After coaching	90	0	0	10
After 3 months	30	10	0	60
<i>Can you imagine founding a startup in the next 3 years?</i>				
Before coaching	70	20	10	0
After coaching	80	10	0	10
After 3 months	25	15	0	60

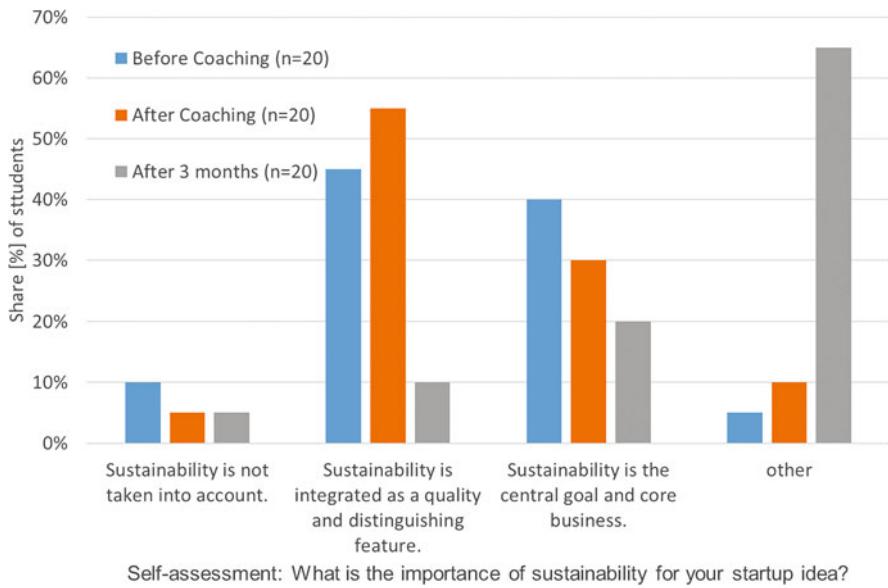


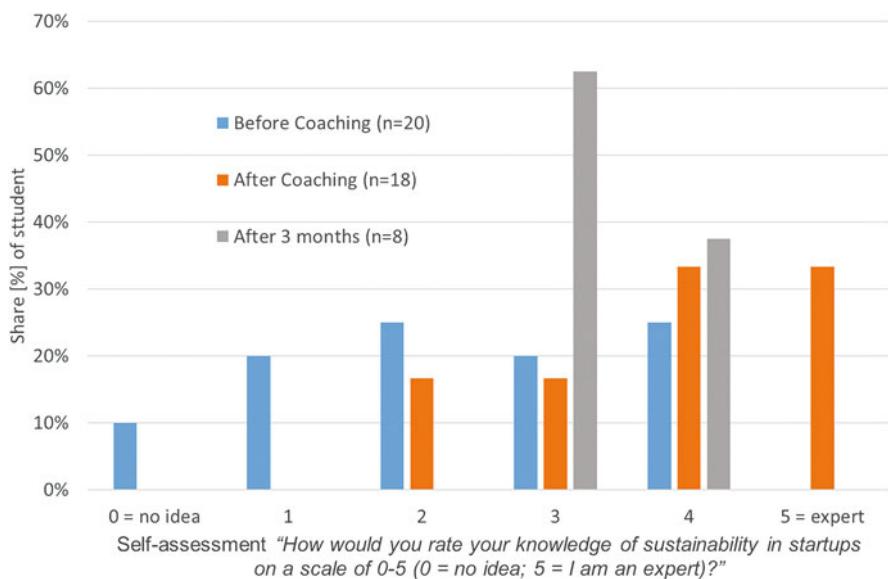
Fig. 4 What is the importance of sustainability for your startup idea?

addition, the students could choose the option “other” to express the answer in own words. This category also includes the students who did not respond to the question. It is especially interesting to see that after the week of the self-assessment, the relevance of the sustainability aspect has somewhat decreased. We interpret this to mean that the students have become aware of the complexity of the startup idea; i.e. they have found out that there are other aspects relevant to the success of the startup idea besides the sustainability aspects. On the other hand, it should be taken into account that the original startup idea has developed further in the course of the coaching week and that certain reorientations have occurred.

In Table 4, the share of correct answers to two questions on basic knowledge about sustainability are displayed (however, at the end of the week only 18 and after

Table 4 Questions on basic knowledge about sustainability—% correct answers

	Start of the week n = 20 (%)	End of the week n = 18 (%)	After 3 months n = 8 (%)
In which year should the Sustainable Development Goals be achieved?	65	94	100
How many Sustainable Development Goals are there?	85	100	100

**Fig. 5** Evolution of shares regarding the self-assessment on “How would you rate your knowledge of sustainability in startups on a scale of 0–5 (0 = no idea; 5 = I am an expert)?”

3 months only 8 answered the questionnaire). It shows that there was already considerable knowledge about the SDGs (Sustainable Development Goals). As these were explained and applied quite exhaustively in exercises, the students were able to answer these questions with a very high percentage of correct answers after the week, but also after 3 months.

Figure 5 shows the development of the shares in the self-assessment to the question “How would you rate your knowledge of sustainability in startups on a scale from zero to five (zero means ‘I have no idea’; five means ‘I am an expert’).” On the one hand, there is a clear shift from lower values to higher values after 1 week of coaching. On the other hand, after 3 months, there is a more modest self-assessment to be observed. However, it has to be noted that four of the students who had used a value of five for their self-assessment before the coaching did not participate after 3 months. Moreover, two of the ones who have used a value of five then gave a value of three or four, respectively, as their self-assessment. The

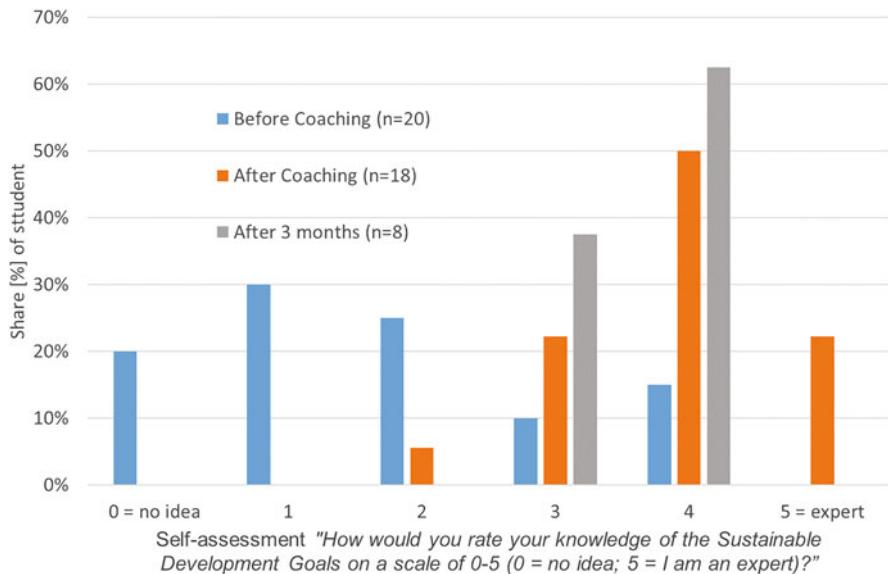


Fig. 6 Evolution of shares regarding the self-assessment on “How would you rate your knowledge of the Sustainable Development Goals (SDGs) on a scale of 0–5 (0 = no idea; 5 = I am an expert)?”

relatively high number of students who applied a value of five regarding their expertise on the “knowledge of sustainability in startups” could be explained with a quite high self-confidence immediately after the coaching. However, there was a kind of more realistic self-assessment after another 3 months.

The results in Fig. 5 are similar to the results in Fig. 6 because the topic “sustainability in startups” is very closely related to the Sustainable Development Goals (SDGs).

It is interesting to compare the results from Figs. 5 and 6 with the results regarding the “knowledge of Eco-Design” depicted in Fig. 7 and the results on “knowledge of social sustainability” depicted in Fig. 8. In particular, with regard to eco-design, the knowledge before the coaching was lower compared to the “sustainability in startups.” After coaching, self-confidence increased, but only at an intermediate level, but with a smaller distribution of differences between participants.

Regarding “social sustainability,” some students associated the term “social” with “social media” before coaching and felt appropriately familiar with it. After the input from the lectures, students had a much better insight into the relatively broad spectrum of social sustainability topics after the coaching.

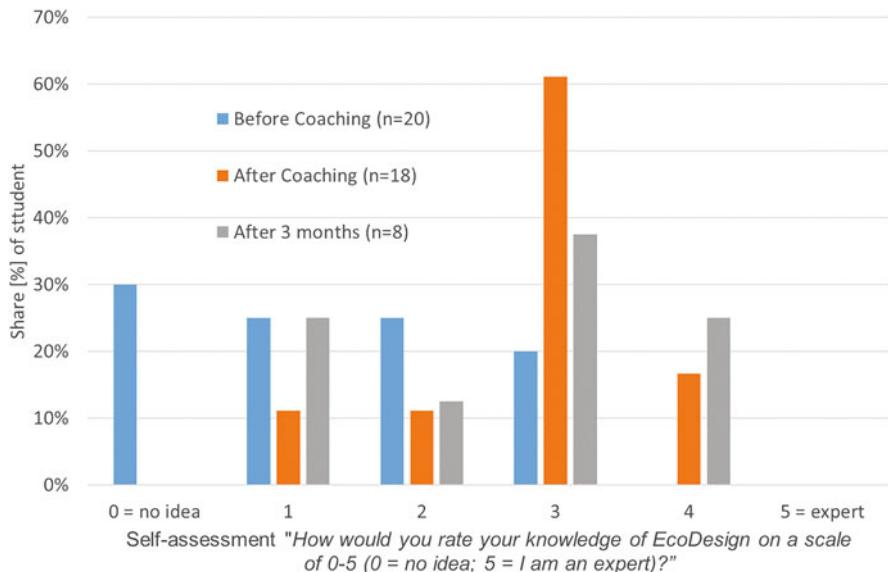


Fig. 7 Evolution of shares regarding the self-assessment on “How would you rate your knowledge of Eco-Design on a scale of 0–5 (0 = no idea; 5 = I am an expert)?”

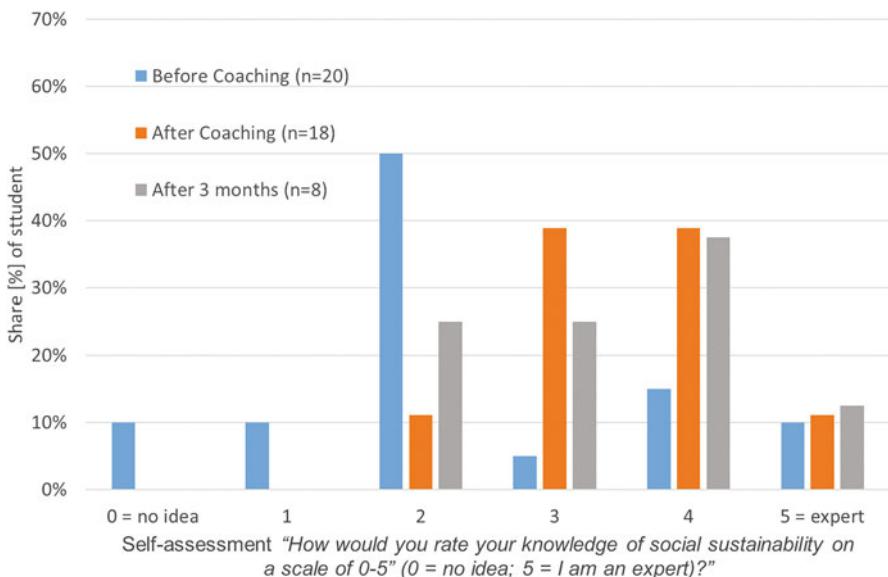


Fig. 8 Evolution of shares regarding the self-assessment on “How would you rate your knowledge of social sustainability on a scale of 0–5 (0 = no idea; 5 = I am an expert)?”

5 Discussion and Conclusion

Our research was conducted within the course of the “Startup Summer Camp on Sustainable Innovation,” a 1-week intensive education format to teach and practice entrepreneurship methods for students at the bachelors’ level at a German university. This lecture is aimed at students interested in developing a startup idea and intended to draw attention to the opportunities offered by the megatrend of sustainability, using “best practice” examples and raising awareness of the complexity of the interrelationships between various aspects of sustainability:

We developed a new education format and applied it in the past couple of years: a coaching concept to consider sustainability aspects integrated into the existing “conventional” entrepreneurship education format.

The transfer of know-how and the method training in combination with the exercises enabled the participants of the coaching to take sustainability aspects into account when developing startup ideas.

The effectiveness of the format was shown by conducting surveys among the students who participated in the course once.

While the contribution to the scientific literature on entrepreneurship is rather limited, we see a practical contribution to entrepreneurship education since the coaching concept can be applied in existing courses easily.

The results of the survey show that before the coaching many participants lacked knowledge about important sustainability aspects. However, it has also been demonstrated that within the very compact coaching session, an important and applicable understanding of the complexity and urgency of sustainable development can be created and applied.

Hence, it seems that the application of the coaching concept was successful and enabled the students to learn about and improve the sustainability impact of their startup idea. This should enable the students to become entrepreneurs or intrapreneurs of tomorrow who consider and improve sustainability aspects in their ideas.

However, our study has major limitations:

- It was only conducted with a limited number of students at Pforzheim University, a German university of applied sciences (where courses are taught with a more practical focus and all bachelor’s students have to spend one semester as an intern in a company as part of the standard curriculum).
- The students selected for the course were selected in an application process. Participants were then selected by assessing the quality of the business idea description and the sustainability and innovation potential of the submitted business idea. Furthermore, the composition of the students should enable interdisciplinary collaboration by a mix of faculty/program affiliation, age, and master’s as well as bachelor’s degree programs. Hence, they are probably more motivated to found a startup and show some basic foundations on the concept of sustainability as average students. Therefore, they do not represent the general body of students at German universities.

- The questions asked can only partially address all aspects of the research questions posed. In addition, a larger share of the students participating in the class did not take part in the part of the survey conducted 3 months after the course.

Due to these limitations, the two following research questions *in italic* posed at the outset of this study cannot fully be answered but could be addressed partially:

- a) *How much are the students aware of sustainability issues and can the level of knowledge regarding sustainability topics be increased with the coaching?*

The results, especially the comparison of the answers in Figs. 5, 6, 7, and 8 at the beginning with the answers directly at the end of the week, show a clear improvement of the level of knowledge regarding sustainability topics.

- b) *Are the students able to design their startup idea in a more sustainable way and/or estimate the level of the impact on sustainability?*

This question cannot be answered clearly. The methods learned during the coaching and practice helped the students to gain qualitative insights into the possible sustainability impact of their startup idea. In particular, for the “physical part” of the startup ideas, first action points to improve the identified impacts were planned. The startup idea was adapted as much as possible or in some cases completely changed. So, we can conclude that there is at least a higher probability that the startup idea can be made more sustainable.

It became clear that our study could only be seen as exploratory due to a limited number of participants. Further research should be conducted with a more sound empirical basis. Also, the research questions could be addressed in more depth by conducting interviews with the participants. It would also be interesting to analyze the further development of the startup ideas over time and determine how the methodological input from the sustainability coaching has influenced the potential sustainability impact of the startup ideas. This will be applied to the startup teams that are supported and promoted by us in the long term. The sustainability coaching will flow into the general coaching and mentoring program at Pforzheim University. If this is successful, we plan to offer sustainability coaching beyond the borders of Pforzheim University.

Acknowledgments The “Startup Summer Camp—Sustainable Innovation” has been organized in collaboration with the Institute for Industrial Ecology (INEC) of Pforzheim University and the GründerWERK- Startup Center of the Pforzheim University of Applied Sciences since 2018. The project management was organized by Ivonne Kurz. The described sustainability coaching concept was further developed with the help and feedback of co-workers, keynote speakers, coaches, students, and jury members, for which we are very grateful. We would like to especially thank Annika Reischl (former research associate at INEC) for her useful hints and support. Moreover, we want to thank very much the students who participated in our questionnaires. The Startup Camp was made possible by funds from the program line “Gründungskultur in Studium und Lehre” of the fund “Erfolgreich Studieren in Baden-Württemberg—FEST-BW” of the Ministry of Science, Research and the Arts Baden-Württemberg (MWK). Since 2020, the startup camp has continued with the support of the project “Design Factory Pforzheim (DFPF)”, grant number 03EP089ZBW, funded by EXIST, a funding program of the Federal Ministry for Economic Affairs and Climate Action (BMWK).

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Entrepreneurial Competencies in Student Companies at School: Development of a Research Instrument



Taiga Brahm and Ute Grawe

Abstract Entrepreneurial competencies are increasingly relevant and thus fostered in schools and universities, for instance, in the form of student companies. However, there are hardly any theoretically and empirically founded research instruments to assess students' competence development. Accordingly, this paper aims to develop and validate a newly designed questionnaire that captures entrepreneurial competencies in three different domains: on the economic, team, and individual levels. The instrument was tested in a pilot test with 163 students and in a main study with 226 students in secondary education. Overall, reliability and the assumed factor structure could be confirmed. The questionnaire can be used in schools and universities for the purpose of quality development and competence assessment in entrepreneurship education.

Keywords Student companies · Competence development · Questionnaire · Entrepreneurship education · Secondary schools

1 Introduction¹

All over the world, entrepreneurship is an important pillar of the economy (Birdthistle et al., 2007; Busom et al., 2017; García-Rodríguez et al., 2019; Johannisson, 2016; Khan & Quaddus, 2015; Morris et al., 2013; Sánchez, 2013;

¹ A major portion of this chapter has previously appeared in Ute Grawe's PhD dissertation: Grawe, U. (2020). Developing Entrepreneurial Competences in Student Companies: An Empirical Study in the Field of Entrepreneurship Education. Tübingen. Available online <https://d-nb.info/1215569459/34>

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Yu, 2013). Accordingly, many countries aim to support entrepreneurial initiatives, for example, by integrating it as a pedagogical principle in schools, colleges, and universities so that potential entrepreneurs can be identified, motivated, and supported to use their capabilities and to act entrepreneurially. In terms of focusing on a sustainable future, entrepreneurship education (EE) may also foster personal and social responsibility and enhance a culture of solidarity (Lindner, 2018). Consequently, the implementation of entrepreneurship within curricula at universities (and at schools) has increased in numbers during recent years (Sánchez, 2013; Peterman & Kennedy, 2003). In recent years, research has also intensified, recently resulting in several literature reviews as well as meta-analyses with the aim of assessing the efficacy of EE (Alanazi, 2019; Bae et al., 2014; Brüne & Lutz, 2020; Kuratko, 2005; Longva & Foss, 2018; Lorz et al., 2013; Martin et al., 2013; Nabi et al., 2017; Samwel Mwasalwiba, 2010). For instance, the recent meta-analysis by Martínez-Gregorio et al. (2021) distinguished between primary, secondary, and tertiary education. Overall, it found a small effect size of EE on increasing entrepreneurial intention and self-efficacy (Martínez-Gregorio et al., 2021). However, there are some methodological issues regarding the studies such as missing control groups (Lorz et al., 2013; Martínez-Gregorio et al., 2021). Above all, only six studies from primary (1) and secondary (5) education could be included in the meta-analysis (Martínez-Gregorio et al., 2021). Thus, there is still a need for more studies on the impact of EE, particularly on primary and secondary students' development of entrepreneurial skills and values (Samwel Mwasalwiba, 2010; Marques & Albuquerque, 2012). This lack of studies within schools is connected to a lack of instruments to reliably and validly assess students' competencies developed in entrepreneurial initiatives. Indeed, there are few instruments available to evaluate EE at schools (Volery et al., 2013), for instance, in the context of student companies. Consequently, this study aims to develop a research instrument to investigate the entrepreneurial competencies to be developed in student companies. Such an instrument is of relevance as student companies are an important opportunity to make young students familiar with the option of starting one's own business. Accordingly, student companies are seen as a possible (collaborative and experiential) learning environment to foster entrepreneurial thinking and action without the need for students to take risks (Pittaway et al., 2011). Therefore, this research instrument advances research on entrepreneurship education, and the findings may help to further develop the evidence-based design of student companies. From a practical point of view, the study can be used to further develop existing programs for student companies.

This article first reviews the state of research on entrepreneurial competencies, which provides the foundation for the competence framework and the development of a corresponding research instrument. Finally, the methods of this study are introduced and followed by the results and a discussion.

2 State of Research on Entrepreneurial Competencies

An initial literature review carried out to clarify the specific competencies in the field of entrepreneurship resulted in more than 100 competencies commonly connected to entrepreneurs [for example, Arafah, 2016; Bacigalupo et al., 2016; Boyles, 2012; Driessen & Zwart, 2006; Lackéus, 2013; Man et al., 2002; Mitchelmore & Rowley, 2010; Wu, 2009; Moberg et al., 2014]. In the following, we will briefly describe selected studies due to their relevance for the field or for EE.

In their literature review on entrepreneurial competencies, Mitchelmore and Rowley (2010) presented a summary of key competencies associated with an entrepreneur's role in different studies. Four aspects emerged: business and management competencies, human relation competencies, conceptual and relationship competencies, and entrepreneurial competencies, which are understood in terms of the identification and definition of a viable market niche, idea generation, recognition, formulation of strategies, and the taking advantage of opportunities (Mitchelmore & Rowley, 2010).

Reviewing an extensive range of literature to assess entrepreneurial competencies, Arafah (2016) provided an in-depth analysis of the number of quantified entrepreneurial competencies ranging from 5 to 25. "Most of them share competencies like passionate, risk-taking, confidence, determination, disciplined, visionary, decision-making, and leadership" (Arafah, 2016). The researcher then proposed a "soft computing-based entrepreneurial key competencies' model (SKECM)" (Arafah, 2016). This model includes three clusters: achievement, planning, and power.

Man et al. (2002) focused on a procedural approach and developed a conceptual model linking "the characteristics of small and medium-sized enterprises' (SMEs') owner-managers and their firms' performance" (Man et al., 2002). This model comprised four constructs, with one of them being entrepreneurial competencies from a process perspective. The authors assumed that these competencies are changeable and learnable and that they "can be investigated from a process perspective, reflecting the actual behavior of the entrepreneur" (Man et al., 2002). Thus, they identified, for example, using contacts, persuasive ability, communication, and decision skills; understanding complex information, risk-taking, innovativeness, and team building; and evaluating and implementing the strategies of a firm as competencies related to (successful) entrepreneurs. However, according to Morris et al. (2013), there has been neither empirical evidence validating these constructs nor insights into how to measure these competencies. In response, these authors (Morris et al., 2013) conducted a Delphi study to measure entrepreneurship competencies. By questioning entrepreneurs and leading entrepreneurship educators, they identified 13 core entrepreneurial competencies.

This approach was also adopted by Driessen and Zwart (2006) in their model called Entrepreneur Scan (E-Scan), which "provides insight into necessary traits and capabilities for entrepreneurship" (Driessen & Zwart, 2006, p.2). The model is based on four components that form a person's competence (knowledge and experience,

motivation, characteristics, and capabilities) and are transferred to entrepreneurial competencies. These include, for example, market, environment, finances (knowledge), autonomy, power, interest in the subject (motivation), achievement, affiliation, effectiveness, risk-taking (characteristics) and organization, financial administration, creativity, and flexibility (capabilities).

Boyles (2012) adopted a knowledge, skills, and abilities (KSA) perspective and identified relevant connections between a core set of twenty-first-century KSA (“Information, media, and technology literacy; inventive thinking; communication and collaboration; productivity and results,” (Boyles, 2012, p. 47)) as well as cognitive, social, and action-oriented entrepreneurial competencies. These include identifying opportunities and developing new ventures, creativity, curiosity, risk-taking, teamwork and collaboration, global awareness, flexibility and adaptability, and initiative and self-direction (Boyles, 2012).

In 2013, Lackéus (2013) developed and published a KSA-based framework for entrepreneurial competencies. This framework was prepared by adapting the concept of entrepreneurial competencies being defined as “knowledge, skills and attitudes that affect the willingness and ability to perform the entrepreneurial job of new value creation; that can be measured directly or indirectly; and that can be improved through training and development” (Lackéus, 2013, p. 1). Hence, entrepreneurial competencies are defined in terms of, for example, mental knowledge (referring to knowledge), marketing, strategy, opportunity identification (referring to skills) and passion, self-efficacy, pro-activeness, and perseverance (referring to attitudes).

The Danish Assessment Tools and Indicators for Entrepreneurship Education (ASTEE) project followed this KSA approach in a more specific way and defined “creativity, planning, financial literacy, resource marshalling, and teamwork [as] skills [...] needed in different phases of an entrepreneurial venture” (Moberg et al., 2014, p. 16). This assessment of entrepreneurial competencies and students’ learning processes included entrepreneurial self-efficacy, entrepreneurial mindset, entrepreneurial knowledge, career ambition, and connectedness to education, that is, entrepreneurship education and teacher support. A large-scale test was carried out with 4900 respondents who were European students at the primary level (aged 10–11), secondary level (aged 16–17), and tertiary level (aged 20+). However, this study focused on the distinction of cognitive-oriented and non-cognitive-oriented entrepreneurial skills as well as how to teach and codify these skills in an entrepreneurial setting.

Intentions and competence levels of EE are combined in the TRIO Model of Entrepreneurship Education, developed during a pilot project of the Schumpeter College (Lindner, 2018). The TRIO model covers three segments: core entrepreneurship education (core competencies fostering entrepreneurial development and implementation on the personal or individual level), entrepreneurial culture (encouraging entrepreneurial thinking, communication, and relationships by empathy and independence), and entrepreneurial civic education (focusing on a societal culture of responsibility in order to face social challenges) (Lindner, 2018).

In 2016, Bacigalupo et al. (2016) developed the Entrepreneurship Competence Framework, emphasizing that “the EntreComp Framework can be seen as a starting

point for the interpretation of the entrepreneurship competence, which over time will be further elaborated and refined to address the particular needs of specific target groups” (Bacigalupo et al., 2016). Entrepreneurial competencies within the competence area of “ideas and opportunities” include creativity, vision, and ethical and sustainable thinking; representative competencies for “resources” are motivation and perseverance, self-awareness, and self-efficacy; and “into action” competencies include taking the initiative, coping with uncertainty, dealing with ambiguity and risk, and focusing on planning and management (Bacigalupo et al., 2016).

3 Competence Framework for This Study

Based on the literature review on entrepreneurial competencies, the competence framework for this study was developed in a multistage process: competencies that were cited most often and hence considered to be important and characteristically for entrepreneurs were aligned with the Entrepreneurship Competence Framework (Bacigalupo et al., 2016, p. 11). This framework was chosen as it “offers a tool to improve the entrepreneurial capacity of European citizens and organizations. The framework aims to build consensus around a common understanding of entrepreneurship competence by defining 3 competence areas, a list of 15 competencies, learning outcomes and proficiency levels, which current and future initiatives can refer to” (Bacigalupo et al., 2016, p. 2).

The conceptual work resulted in three competence areas: First, competencies on the *economic level* included aspects such as vision, working strategically, using resources, planning and organizing, security and risk awareness, creativity, problem-solving, and ethical and sustainable thinking. Second, *team-level* competencies comprise, for instance, spotting opportunities, communicating successfully, working together in heterogeneous groups, and networking. Third, competencies on the personal level encompass assuming responsibility, working independently, motivation and perseverance, reflecting, self-awareness, and self-efficacy (Grewe & Brahm, 2019).

4 Research Methods

To validate the model and assess the reliability and validity of the research, the study was based on a survey design to gather data from students participating in so-called student companies in the south-west of Germany. Participating in a student company was part of the students’ extra-curricular economic courses (grade 11 in secondary schools).

4.1 Research Instrument and Questionnaire Design

The survey was questionnaire-based, translating the previously discussed framework into survey items. The questionnaire was distributed online.

Participants The pilot test of the survey was administered in May 2017 by email to participants in student companies during the 2016–2017 school year to test the scales and gather feedback on the survey design and comprehensibility. The survey was again administered in November 2017. On both occasions, the email explained the survey objectives and the confidentiality agreement and included a hyperlink to an online survey collection tool. One week before the closing date of the survey, a follow-up email was sent to all students to remind those who had not participated yet. Respondents were asked to self-assess their entrepreneurial competencies from a range of competencies presented using a five-point Likert scale (1 = does not apply at all to 5 = fully applies). Respondents were not compensated for their participation.

The sample of the pilot test included 163 students (87 female and 76 male students), ranging in age from 16 to 18 ($M = 16.79$; median = 17). In the main testing, 226 of 677 students completed the questionnaire, corresponding to an overall response rate of 17.38%. This sample ranged in age from 13 to 20 ($M = 16.26$; median = 16) and included 135 female students and 80 male students (11 non-response).

Research instrument The questionnaire included three sections: entrepreneurial competencies; questions on students' motivation in economic lessons and on individual interest in economics in general; and demographics (e.g., gender, age, grade). Based on the previously outlined competence framework, survey questions were created for the self-assessment of students' entrepreneurial competencies. The core of the questionnaire was based on a list of entrepreneurial competencies gathered through the literature review (see above) and tested by means of the pilot test, as previously mentioned. In the pilot test, each student received the original survey with 225 items. To assess scale properties, a series of factor and reliability analyses were performed to validate the scales (for further details, see below). Items that were not consistent within the rotated component matrix were deleted. This pilot test resulted in a shortening and modification of the original questionnaire to a final set of 139 items; this process also avoided increasing tardiness due to many questions, increased precision and validity, and did not limit the questionnaire's reliability.

The remaining 139 items developed for the online questionnaire cover the 15 identified competencies, with each of the competencies subdivided into several theoretical constructs that were assessed using different statements. In Table 1 provides an overview of the constructs and shows a sample item for each construct.

Table 1 Constructs and sample items

Construct	Sample item
Economic level	
Understanding economic concepts	"I can explain how market prices come about."
Vision	"I can imagine my future."
Managing resources	"It is important to share resources with others."
Planning and organizing	"I can create a strategy to achieve goals."
Calculating and managing risks	"I can evaluate risks to take decisions."
Creativity and problem-solving	"I can actively search for solutions."
Ethical and sustainable thinking	"I can investigate social and technical developments in relation to sustainability."
Personal level	
Assuming responsibility	"I can take individual and group responsibility."
Motivation and perseverance	"I can stay focused on my tasks."
Reflecting	"I can reflect on failures and learn from them."
Self-awareness and self-efficacy	"I do not let myself be disturbed even under heavy workloads."
Team level	
Spotting opportunities	"I'm interested in creating an activity by looking at it as a whole."
Communicating successfully	"I can communicate the vision for my venture in a way that inspires and persuades others."
Sharing and protecting concepts	"I can explain that ideas can be shared and circulated and can be protected by certain rights."
Working together in heterogeneous groups	"In group works I can contribute constructively."

4.2 Data Analysis

Data gathered from the 226 useable questionnaires (main test) were analyzed using SPSS and MPlus. To ensure the internal consistency of the scales, a factor analysis based on the factor-derived scale's responses was carried out, followed by the calculation of reliability estimates to measure the consistency of items within the same construct. The reliability analyses produced internal consistency values (Cronbach's alpha), with estimates ranging between 0.643 ("Working together in heterogeneous groups") to 0.883 ("Communicating successfully").

5 Results

5.1 Internal Consistency

Table 2 shows the number of items per scale and the values of Cronbach's alpha (for the main test) as well as the descriptive values of the scales. Although some scales do not make the usual threshold for Cronbach's alpha, the test shows overall satisfactory to good internal consistency values.

Table 2 Reliability, standard deviation, and means^a

Scale in questionnaire	#of items	α	Mean	Standard deviation
Understanding economic concepts	2	0.666	3.4376	0.74485
Vision	4	0.845	3.6029	0.86885
Working strategically	5	0.791	3.9148	0.56783
Using resources	4	0.563	4.4170	0.47855
Making the most of your time	4	0.827	3.6599	0.73748
Managing resources	5	0.783	3.5688	0.66413
Planning and organizing	3	0.707	4.1942	0.56236
Being flexible and able to adapt to changes	3	0.816	3.8780	0.73559
Developing strategies and business concepts	6	0.844	3.5596	0.65633
Calculating and managing risks	4	0.738	3.7319	0.57323
Problem-solving	4	0.755	4.0602	0.59650
Developing ideas and shaping values	2	0.682	3.7146	0.61939
Behaving ethically	3	0.718	3.8153	0.75219
Assessing ethical impacts and thinking sustainably	5	0.781	3.8221	0.27548
Assuming responsibility	3	0.736	3.9867	0.73657
Being target-oriented	5	0.733	3.8440	0.65257
Being resilient	3	0.790	3.7581	0.68236
Reflecting	3	0.674	3.9742	0.62692
Acting strength-based	6	0.827	3.9218	0.65436
Shaping one's own future	2	0.573	3.9027	0.65780
Analyzing interrelationships	3	0.726	3.6308	0.80955
Spotting challenges	3	0.728	3.6719	0.68570
Making requirements visible	3	0.665	4.0688	0.59717
Communicating successfully	7	0.883	3.9142	0.66183
Using media effectively	4	0.857	4.0060	0.70291
Sharing and protecting concepts	3	0.789	2.9275	0.90701
Working together in heterogeneous groups	6	0.643	4.2606	0.44621
Networking	3	0.648	3.6364	0.56800

^a Values are shown for the main study only

5.2 *Discriminant Validity*

In the first exploratory factor analysis (principal component analysis with Varimax rotation), a 40-factor structure emerged based on the Eigenvalue-greater-than-1 method. Although most items could be allocated to the theoretically expected factors, 31 items had to be discarded due to confusion with other factors. These items were not deemed necessary to reflect the complexity of the respective constructs; accordingly, they were deleted and not used in further analyses. The remaining items loaded on 28 different factors (see Table 2) with some cross-loadings, mostly indicating the theoretically assumed relations among the factors.

5.3 *Construct Validity*

Using confirmatory factor analysis (CFA), the model was tested separately for each of the three levels (individual, team, and economic levels). For each level, a g-factor solution was compared to a solution based on the number of theoretically assumed factors (with the three conceptual levels—economic, team, and individual—as reference points). Analyses were carried out with data from both studies and brought similar results. In the following, the results of the main study will be reported. For each level, the analysis showed that a g-factor solution was not indicative. Instead, for the individual level, a 6-factor structure yielded reasonable results ($CFI = 0.901$; $RMSEA = 0.068$; $SRMR = 0.053$). For the economic level, the expected 13-factor structure brought mediocre results for the CFI but good results for the RMSEA and the SRMR ($CFI = 0.887$; $RMSE = 0.047$; $SMSR = 0.056$). For the team level, the expected 7-factor structure showed reasonable results ($CFI = 0.906$; $RMSE = 0.056$; $SMSR = 0.056$). All in all, the confirmatory factor analyses supported our theoretical assumptions.

6 Discussion and Conclusion

There have been few validated instruments to assess entrepreneurial competencies to evaluate entrepreneurial programs in the school context (Fayolle, 2013; Egbert, 2014). At the same time, there is a need for the identification and evaluation of students' competencies that should be acquired in entrepreneurship courses (Martínez-Gregorio et al., 2021). This study sought to contribute to the literature on entrepreneurship education by developing a theoretically founded instrument to determine (school) students' entrepreneurial competencies. The study identified 15 entrepreneurial key competencies and, accordingly, developed an instrument with 28 individual factors on three levels. The main benefit of our new framework is that it is based on a sound review of different conceptual frameworks. Second, it

distinguished three levels (economic, personal, and team) and their corresponding competencies. The instrument was developed with a pilot and a main study and involved students in schools. Both studies showed that the instrument developed proved to be reliable and valid. Accordingly, the instrument advanced the framework designed by Bacigalupo et al. (2016), which “has not yet been adapted to, or tested in real settings” (Bacigalupo et al., 2016, p. 7). This assessment tool can thus be applied in entrepreneurial programs to assess students’ competencies. Its results may help teachers decide which content to highlight as part of their entrepreneurial course programs to further enhance the students’ competence development. Further insights into the impact of entrepreneurial education programs will help “inform the development of effective entrepreneurial programs” (Morris et al., 2013, p. 365). Thus, the instrument can have a practical impact on the context of fostering entrepreneurial mindsets. Furthermore, at a broader theoretical level, the findings also have implications for the emerging research on entrepreneurial programs or interventions, and the empirical evidence from this study provides a foundation for research on long-term impacts of EE. By pointing out the relevant competences fostered by entrepreneurial programs, this study will also help set the standards for the desired learning outcomes because, currently, there are no common standards yet due to the heterogeneity of existing entrepreneurship programs.

6.1 Limitations of the Study and Future Research Suggestions

Despite the strengths of this survey, there are certain limitations to this study that should be noted. First, the data from this study are based on self-reported measures, thereby showing the usual problems of self-reported data; however, in this case, some of the constructs were conceptualized as self-reports and should, thus, be rather valid. Nevertheless, a second source of data would be particularly useful for some constructs, e.g., the extent of economic competencies. Second, this study was conducted with participants of a particular kind of student companies only, without considering other entrepreneurial programs. Thus, there is a limitation in terms of generalizability. At the same time, this limitation also reduced contextual variance in the data. Another limitation is that other competencies might also be relevant for entrepreneurial success, which were not assessed by the instrument.

Notwithstanding these limitations, several future research questions emerged from our study. First, the instrument should be used more frequently, as well as in other contexts, to further establish its reliability and validity and to strengthen the generalization of results. This could include students from other institutions (for example, higher education) or different countries so that future research would be extended to an international basis. The instrument was already successfully applied to assess students’ competence development in mini-companies at school (Grawe & Brahm, 2020). Furthermore, research on the long-term effects of EE and training can

demonstrate the likelihood of not only becoming an entrepreneur but also founding a start-up. Thus, this could provide a more objective measurement of the success of EE. Moreover, further studies are needed to explore, more specifically, different forms of entrepreneurial learning as well as assess variants of the programs offered in terms of the duration of the program or voluntary versus mandatory participation.

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Moving the Needle in Entrepreneurship Education and Bridging the Gaps



Nils Högsdal, June Nardiello, and Piet Kleeßen

Abstract Several German states have implemented programs and funding to promote entrepreneurship education and culture within their universities. These programs and projects are typically awarded on a competitive basis to several colleges and universities in order to raise awareness and enthusiasm among students and to provide skills in the context of innovation and entrepreneurship. This chapter reflects upon the impacts of two of these projects on students' motivations to start their own businesses, as well as which ideas they pursue. In the first project, several thousand students were exposed to entrepreneurship early in their studies. The other is a related program that—at a later stage—has helped more than 600 teams of student entrepreneurs to further validate their ideas. Findings from both studies are interpreted in the context of funnel logic to derive recommendations for overcoming the gaps and breaking points in students' entrepreneurial journeys.

Keywords University programs · Seed accelerator · Student motivation · Entrepreneurial journey · Classification of ideas

1 From Inspiring Students to Actual Startups

This chapter acknowledges that a broader perspective on entrepreneurship education regards it as a key personal skill, with aspects such as creativity, employability, and aptitude for business model innovation (Halbfas & Liszt-Rohlf, 2019). Several European Union publications describe the “sense of initiative and entrepreneurship” as a key competence (Bacigalupo et al., 2016). Furthermore, this chapter focuses on

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entrepreneurship educators' primary goals: providing students with entrepreneurial skills and supporting them in becoming entrepreneurs. A focus on these concrete, measurable outcomes is also explained by the expectations of policymakers (Rideout & Gray, 2013). There is also a link to the third mission of universities' contributions to their entrepreneurial ecosystem and implementing innovation, as well as generating employment (Kuckertz, 2021). A study by the Massachusetts Institute of Technology (MIT) estimates that MIT alumni have founded at least 30,000 (active as of 2014) companies, employing 4.6 million individuals and generating annual global revenues of \$1.9 trillion (Roberts et al., 2019). Similar data are presented in a study at Stanford, with an estimated 5.4 million jobs created (Eesley & Miller, 2018). Using this as a benchmark, how do we even get close to that when looking at much smaller and younger German universities like Stuttgart Media University? What are the gaps and how can we bridge them?

1.1 Starting Point

The 2016 GUESSS study attributed Stuttgart Media University the strongest entrepreneurial spirit of all German universities surveyed (Bergmann & Golla, 2016). While these data were promising, further analysis revealed areas for improvement in terms of visibility, support in taking the next step, and gender distribution. An internal survey in 2015 disclosed that only 22% of the students had ever thought about starting a business and that only 49% knew that support was provided by the university (Zepf, 2016). In addition, few students actually move forward with the startup ideas they do have. This is especially true at the undergraduate level, as shared by other educators (Say & Schramm, 2013). The evaluation of a bachelor's entrepreneurship course by the authors over 12 semesters showed that of a total of 107 generated startup ideas, only four were taken to the next level. This rate is not any higher for research projects or other student projects. Further data show that young women in particular shy away from the idea of starting a business (Schneider et al., 2021). Only 18% of the recipients of Exist (a startup grant by the Federal German government for university graduates) are female (Bundesministerium für Wirtschaft und Energie, 2021), compared to 49% of the student body in Germany (Statista, 2021).

1.2 Funnel Logic of Entrepreneurship Education and Support

Good entrepreneurship classes and a well-run startup center alone will not leverage the full potential of a university to generate startup activity since a few important aspects are still missing. Studies show that students who have been exposed to entrepreneurship education programs are more interested in entrepreneurial careers

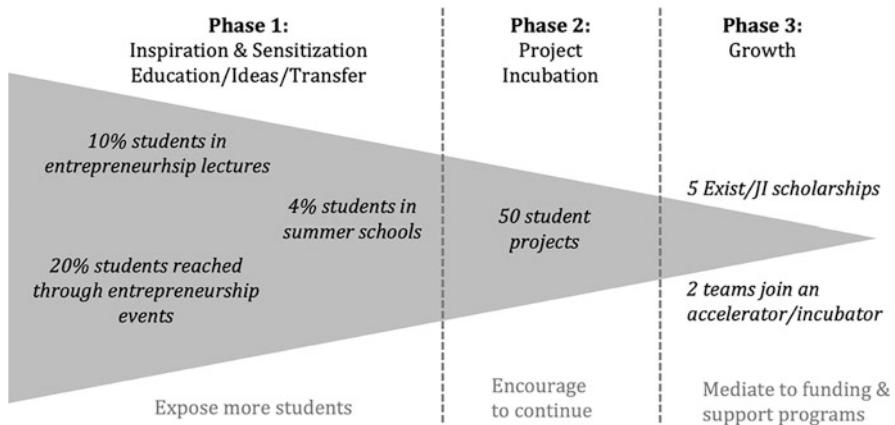


Fig. 1 Entrepreneurship education funnel with targeted annual entrepreneurial success indicators from Stuttgart Media University (total of 5000 students) within a single year at the university level

and more inclined to create a business (Schneider et al., 2021). In addition, the belief that one can be successful as an entrepreneur is stronger among students who have taken entrepreneurship classes (Giacomin et al., 2011). The previously quoted MIT study suggests that entrepreneurial activity can be actively encouraged. While approximately 3.5 active companies were founded per 100 MIT alumni during the 1960s, by the 1980s, this figure had jumped to 10.7; it rose to 13.4 in the 2000s and was expected to rise to 18 companies in the 2010s (Roberts et al., 2019).

The hypothesis underlying the approach presented here is that entrepreneurship education is a continuous process, beginning with the inspiration and eventually leading to actual support for founders. Entrepreneurship as such can be considered a process chain (Fueglstaller et al., 2016); the goal is to address students during their studies and match their entrepreneurial journeys with the student lifecycle. We suggest that transitions from one step (e.g., generating and later validating an idea) are predetermined breaking points that cause promising projects to be discontinued. Figure 1 outlines this process, with the two goals of reaching more students and closing the gap during the pre-foundation phase in the validation of ideas by encouraging more students to continue and eventually directing them to existing funding and support programs. This “funnel logic” was derived with key performance indicators from Stuttgart Media University (total of 5000 students) within a single year and throughout the process, from introducing students to the ideas of entrepreneurship to actual startup support. A similar model was found in a study by Jansen, with a three-stage student entrepreneurship encouragement model (Jansen et al., 2015).

1.3 Approaches to Widening the Entrepreneurship Education and Support Funnel

The question, then, is how to “widen” this funnel and avoid the loss of so many students during the educational process. Reflecting on the measures taken at Stuttgart Media University, lectures and classes and the actual support for students actively ready to start a company were sufficient, and two areas for improvement were identified:

1. Expose more students to entrepreneurship early in their studies.
2. Encourage more students to continue to work on their ideas.

Two initiatives were created to pursue those goals: Spinnovation, together with two other universities, and the statewide Academic Seed Accelerator Program Baden-Württemberg (ASAP BW). The Spinnovation project formulated—among other goals—the “Vision 100%,” with the goal of exposing every student to entrepreneurship and innovation early in their studies. Several workshop formats were created for first-year bachelor’s students, and 220 workshops occurred, the majority as ideation workshops using design thinking approaches during the onboarding phase. Other formats included open idea competitions, founder talks, and startup nights. Approximately 10,000 students were exposed to entrepreneurship, and close to 3000 students completed a survey Spinnovation (2020). Outcomes are shared in Braukmann et al. (2023), focusing on motivators and fears among students in starting a business, as well as the impact of certain measures on attitudes and perceptions about entrepreneurship.

ASAP BW, which encourages students to actively take their ideas forward and turn them into validated business models (ASAP BW, 2021), was designed to bridge the gap between students’ developing startup ideas and actively seeking support programs and funding for these ideas. Cohen first used the term “seed accelerator,” defining it as “a fixed-term, cohort-based program, including mentorship and educational components, that culminates in a public pitch event or demo-day” (Cohen & Hochberg, 2014). In comparison, incubators support startups primarily as service centers in the early phases of their foundation (Kollmann, 2011), with a focus on the realization of business ideas (Högsdal et al., 2018). They typically provide services such as financing, legal support, physical facilities, goals, and structure (Barbero et al., 2014). Classical accelerators support the growth of startups with functioning business models (Högsdal et al., 2018). The authors’ view is that seed accelerator programs support the initial discovery and validation of a business model and are designed in line with customer discovery and the lean startup approach of “validated learning” and “fail faster,” with the opportunity for rapid iterations.

ASAP BW is designed as a cohort-based, decentralized, and statewide seed accelerator program in the form of a competition with a standardized, well-established set of tools and methods specifically adapted to colleges and universities. It uses the modern approaches of the agile startup world, such as design thinking, customer validation, and business model generation, with the goal of quickly

validating the viability of an idea and the associated business models, built up in five validation challenges. All students and recent alumni from Baden-Württemberg can access the program anytime at a low threshold with the aim of the successive validation of the idea and business model.

2 What Motivates Students Toward Entrepreneurship

As part of the Spinnovation project run from 2016 to 2020, a comprehensive survey was designed. At the end of the second semester of their bachelor's program, every student was invited to complete the survey. Incomplete questionnaires and answers from students in other semesters were excluded. The final sample comprised 2698 bachelor's students from the polytechnic universities Aalen, Reutlingen, and Stuttgart Media University, 1181 of whom had benefited from one of the Spinnovation formats. The other 1517 served as a control group. The sample came close to the overall demographics of the universities, traditionally having an engineering focus: 53% were male and 47% female, while 44% were enrolled in engineering or IT programs and 37% in business or law programs (Schneider et al., 2021).

The first aspect of the survey was entrepreneurial intent and attitude. Seventy-five percent of the students exposed to entrepreneurship during the first year of the study program responded that they agreed or strongly agreed that their university encouraged students to become entrepreneurially active. For the control group, only 48% gave this answer Spinnovation (2020). Students were asked if they knew a contact point, person, or place for entrepreneurship at their university, and 70% of students who had been exposed answered yes, compared to 30% of the control group. At the same time, 78% of the students with a contact point strongly agreed or agreed that they felt encouraged Spinnovation (2020).

The other two aspects of the study were possible reasons or motivators for and possible obstacles or reasons against entrepreneurial activity, in the sense of willingness to start a venture (Schneider et al., 2021). Figure 2 presents the detailed results from a gender perspective. The top reasons stated were the “possibility to realize one's own ideas,” “freedom to decide for myself/to be my own boss,” and “prospect of financial success.” “Financial success” displayed a strong gender difference, with 58% of the males but only 31% of the females choosing this option, followed by “solving a problem, e.g., designing a product” and “proactively changing the world” (Schneider et al., 2021). A similar study by Giacomin et al. interviewed 2093 students from five countries (the United States, China, India, Spain, and Belgium) and various fields of study about their motivations and barriers to starting a business. They similarly discovered that the five strongest motives for starting a business are “the chance to implement my own ideas,” “creating something of my own,” “personal independence,” “being at the head of an organization,” and “the opportunity to be financially independent.” The study further identifies differences between students from different nations, with independence being particularly

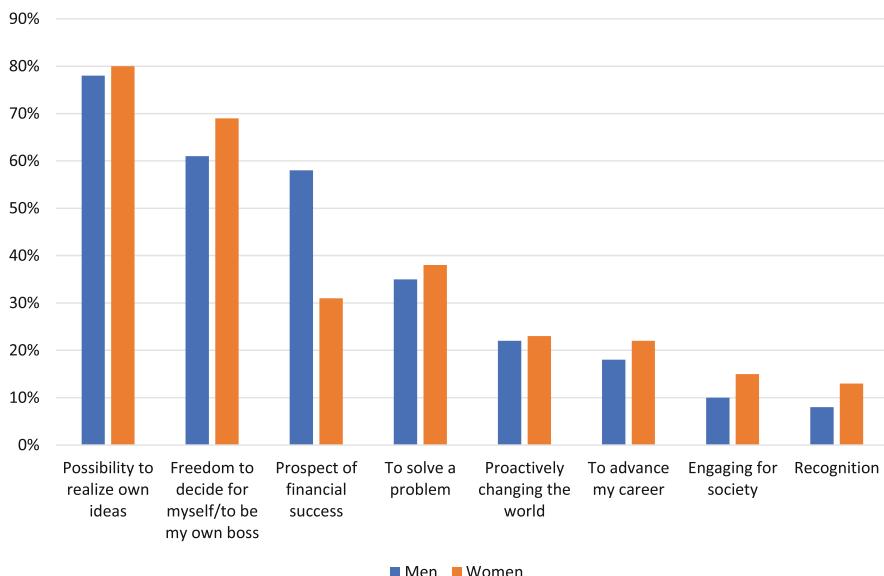


Fig. 2 Insights into students' attitudes toward starting their own business

important for students from the United States and India, compared to other motives and other nations (Giacomin et al., 2011).

The five most significant perceived barriers to starting a business among the students examined by Giacomin et al. were “excessively risky,” “lack of initial capital,” “lack of entrepreneurial competence,” “current economic situation,” and “fear of failure” (Giacomin et al., 2011). Further possible barriers discovered by Pruett et al. can also include tradition and history; for example, Chinese students whose intentions to pursue entrepreneurial careers were often impacted by their families (Pruett et al., 2009). The Spinnovation study similarly stated “high financial risk/no funds” and “high Insecurity/fear of failure” as the top reasons, as shown in Fig. 3 (Schneider et al., 2021). A strong gender difference was identified in “fear of failure,” with young women scoring 57% higher on this dimension (25 percentage points, 69% vs. 44%). A similar observation in regard to gender differences was made in a 2015 study about attitudes toward failure (Kuckertz et al., 2015). Further reasons included “lack of ideas,” “lack of qualifications” (comparable to lack of entrepreneurial competence), and alternative attractive job options (Schneider et al., 2021). The final reason might be specific to the strong labor market in the state, which has one of the highest shares of “opportunity-driven” versus “necessity-driven” entrepreneurs (Metzger, 2015).

Recommendations include elaborating on the opportunities considering the gender differences and holding a differentiated discussion on startup failures, while also sharing success stories. The lack of ideas as well as of qualifications and cofounders can easily be mitigated during students’ entrepreneurial journeys.

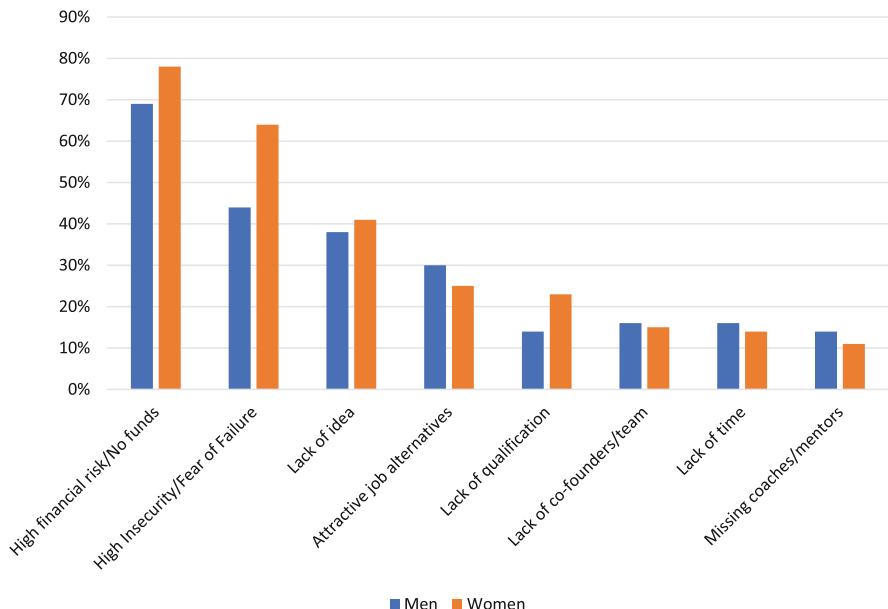


Fig. 3 Insights into students' reasons and attitudes toward not starting their own business

3 What Ideas Students Really Care About

This section analyzes and provides insights from the first 506 teams who participated in ASAP BW, introduced in the first chapter. It reviews the participating teams and members in regard to the ideas, motivations, and demographics of more than 1300 program participants.

3.1 Participants and Teams

From the beginning of the first ASAP BW round in October 2018 until the end of the seventh in February 2022, a total of 1319 participants were registered. These include students or recent alumni from universities of applied sciences, universities, state-approved private universities or colleges, and universities of cooperative education and some art, movie, and pop academies.

Concerning the diversity of the participants, the share of 32% female participants was considerably higher than the 10% female founders in Baden-Württemberg (Sonnenmoser & Seifert, 2021) and 18% in Germany as a whole (Kollmann et al., 2022). We hypothesize that this high participation rate among women occurs because ASAP BW is often integrated into the curriculum or at least awarded with a certificate and ECTS encourages more females to join. The focus of validated

learning is promoted, thereby mitigating the aspect of actually failing with an idea. Data suggest that young women are more goal-oriented in their studies and graduate earlier (Bundesministerium für Bildung und Forschung, 2021). Also, the overall diversity seems to be higher, compared to 22% of migrant founders in Germany, but this evidence is mostly anecdotal based on interaction with the teams (Kollmann et al., 2022).

A total of 506 teams were formed, with an average team size of 2.6. Three-hundred and ninety teams submitted ideas that could be analyzed and thus were considered in this sample. The gap is due to data privacy issues, with not all teams applying for the final pitches; in the end, some teams decide against applying for the opportunity to pitch in the finals. Failing to reach problem–solution fit or product–market fit during the program is the number one reason for this, followed by teams finding similar products or services already on the market. Some teams simply need more time for validation and often (re-)apply later. Resolving intellectual property concerns is a typical explanation. A few teams do not meet the competition criteria (no affiliation to a university) or “only” joined the program for the learning part.

3.2 What Ideas Students Are Working on

The basis for the analysis is the 77% of the teams who submitted evaluable business ideas. Half also applied for the final pitches. All ideas were categorized by the authors based on classifications from the German Startup Monitor 2021 and Startup Atlas Baden-Württemberg. Limitations exist in the categorization; the students’ ideas in such an early stage still lack focus, as they include very different market opportunities. Frequently, the teams moving on with their ideas (20% of all teams) will experience major pivots.

1. Figure 4 provides an overview of the addressed customers by students. Half of the Students Have a B2C Bias: 52% of the students’ ideas address the end customers (B2C) with a bias for target groups being students like themselves. The remaining customers addressed were split into 28% targeting business customers (B2B), 16% addressing both (e.g., platforms for businesses and end consumers), and only 4% addressing the public sector (schools, universities, or the government/

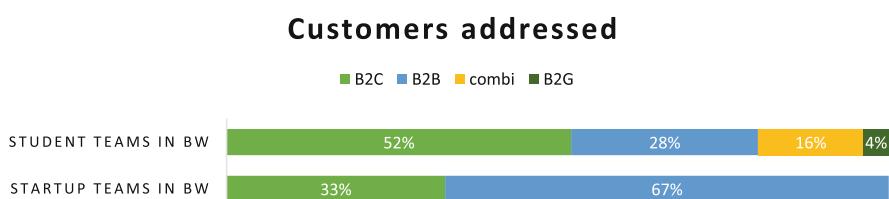


Fig. 4 Customers addressed by student teams participating in ASAP BW ($N = 390$) compared to existing startups in Baden-Württemberg ($N = 777$)

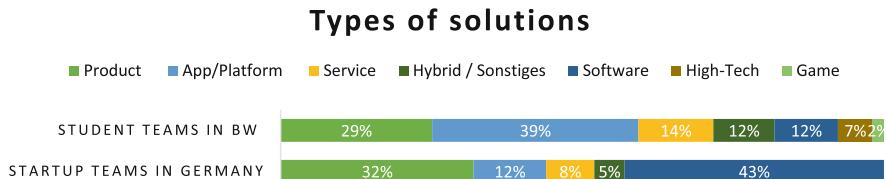


Fig. 5 Types of solutions by student teams participating at ASAP BW ($N = 390$) compared to existing startup teams in Baden-Württemberg ($N = 777$)

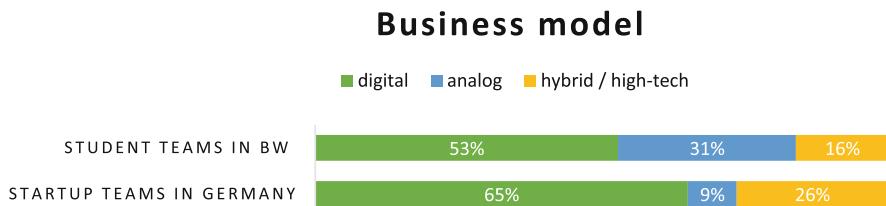


Fig. 6 Business models by student teams participating in ASAP BW ($N = 390$) compared to existing startup teams in Germany ($N = 1962$)

B2G). The challenge was to differentiate direct versus indirect relationships, with only businesses being partners versus actual customers. Compared to existing startups in Baden-Württemberg, where 67% are B2B and only 33% in the B2C customer segment, it becomes even clearer that students focus more on ideas targeting end consumers (Sonnenmoser & Seifert, 2021).

2. Figure 5 provides an overview of the types of solutions. Students Love Apps and Platforms: Concerning the kind of solution they are working on, apps were first, with a total of 39%, and the majority (20% of the overall sample) actually being platforms. Physical products are next, at 23%, followed by services at 11%. Ten percent of the ideas are software solutions, while 9% are hybrid solutions involving products and software or services. Only 5% qualify as high-tech, and 2% are games. When compared to actual startups in Baden-Württemberg, the differences were significant, with 43% pursuing software solutions, 32% being product oriented, and only 12% being platforms and 8% service solutions (Sonnenmoser & Seifert, 2021).
3. Figure 6 provides an overview of the chosen Business Model: Student solutions tended to be less digital than in the real world. In terms of the business model students preferably apply, half of all ideas can be classified as digital business models (53%)—with the challenge of differentiating a digital component in the product from an actual digital business model. Thirty-one percent are classified as analog business models, and 16% are hybrid. Compared to existing startups in Germany, the percentage of digital business models is higher at 67%; analog business models comprise only 10%, and hybrid business models 17%, being mostly high-tech solutions (Kollmann et al., 2022).

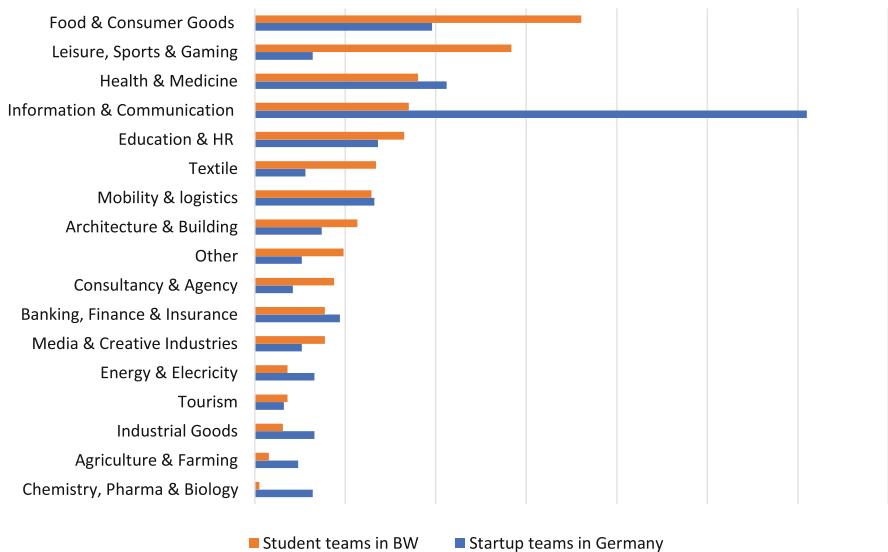


Fig. 7 Classification into sectors of student teams participating in ASAP BW ($N = 390$) and startup teams from Germany ($N = 1962$)

4. Sectors and Industries: The search begins in students' backyards; the classification of ideas into different sectors is quite challenging due to a high number of potential market opportunities. Yet, the results, as displayed in Fig. 7, show a strong bias toward ideas in students' everyday life sectors, such as food and consumer goods at 18% and leisure, sports, and gaming at 14.2%, followed by health and medicine at 9% and information and communication at 8.5%. This correlates with students' bias toward ideas developed for students as customers, an observation shared with other educators (Say & Schramm, 2013). The predominant sector for startups in Germany is information and communication, at 30.5%, followed by health and medicine at 10.6%, food and consumer goods at 9.8%, and mobility and logistics at 6.6% (Kollmann et al., 2022). The comparison indicates that both students and actual founders target everyday life solutions, with founders more focused on work-related solutions (such as information and communication) and students more on leisure and free time. An analysis of the ideas and teams actually qualifying for the final pitches and moving to the next step in incubation programs shows a stronger B2B focus, with sectors being closer to the overall startup teams (Gründermotor, 2021).
5. Impacts Aligned with Overall Startup Activity: 38% claim a social or green impact, which is very similar to German startups overall, with 43% categorizing themselves as having a sustainable impact and being part of a “green economy” and 38% having a social impact (Kollmann et al., 2022).

4 Conclusion

The data clearly indicate that exposing students to entrepreneurship early in their studies increases awareness and also positively changes perceptions about their university as an institution supporting entrepreneurial activities. At the same time, opportunities for self-realization in the sense of working on one's own ideas and being one's own boss are the strongest motivators. Financial success is a dominantly male motivator but should not be underestimated. The impact seems to resonate with a minority; still, we suggest that those students may not be reached otherwise in regard to entrepreneurship education. All of these aspects deserve to be shared in an entrepreneurship class by sharing data, other empirical evidence, or role models.

The strongest demotivators are the fear (and stigmatization) of failure and financial losses, followed by the lack of an idea, competencies, and cofounders. Attractive job offers increase opportunity costs by decreasing the number of necessity-driven entrepreneurs. We argue that all other aspects can be mitigated by providing safe spaces within the university to work on ideas, turning perceived failures into documented learning. This will be an area for future research about the role of credits and certificates in promoting entrepreneurship education.

A major aspect of this is the introduction of (academic) seed accelerator programs bridging the world of learning with credits as a reward and financial success to motivate students and recent alumni to take the next step. Even if only one idea out of 10 turns into a startup, this is a considerably higher number than in the current situation. The data show that students begin with a strong bias toward things they know and understand. Yet the teams moving on have ideas resembling more actual startup activities. One area for further research is to validate whether those teams with the right sectors and industries are more successful or if the approach and the support will help them to achieve product–market fits in areas beyond their initial thinking.

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Part II

Context and Target Groups

of Entrepreneurship Education

Entrepreneurial Design Thinking[©] in Higher Education: Conceptualizing Cross-Cultural Adaptation of the Western Teaching Methodology to the Eastern Perspective



Ria Tristya Amalia and Harald F. O. von Korflesch

Abstract Design thinking continuously positively impacts teaching and learning as a teaching methodology in entrepreneurship education. However, the research has not yet identified a potential method for the cross-culturally adaption from the Western to the Eastern teaching perspective. The Western teaching practices of entrepreneurial design thinking (Entrepreneurial Design Thinking[©]) is a trademark of VonKor GmbH in Germany. Detail information concerning the term is explained further in the article.) may not be universally applicable to the Eastern view of entrepreneurship education. By reflecting on the social-constructivist approach and using cross-cultural adaptation theory, this paper proposes and develops a conceptual framework to describe the cross-culturally adaption of the entrepreneurial design thinking methodology from the Western to the Eastern perspective of entrepreneurship in higher education. The example primarily relates to Indonesia.

Keywords Entrepreneurship Education · Design thinking · Cross-cultural adaptation · Entrepreneurial design thinking · Teaching methodology · Higher education · Conceptual framework · Indonesia

1 Introduction

Over several decades, entrepreneurship education and research have expanded rapidly in the United States and Europe (Amalia & von Korflesch, 2022; Matlay, 2009; Packham et al., 2010). Meanwhile, in Eastern or Asian countries, entrepreneurship education has been thriving for approximately the last twenty years. For instance, In Malaysia, entrepreneurship is heavily regarded as stimulating the economy and maintaining competitiveness (Arokiasamy, 2012). Education that promotes

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entrepreneurship awareness is essential for developing a knowledge-based economy (Cheng et al., 2009). Moreover, the present Chinese administration has stressed the importance of public entrepreneurship and innovation, demonstrating the country's strong desire to promote economic growth through entrepreneurship (Liu, 2015). This policy raised the number of students enrolled in Chinese institutions for higher education and the number of new enterprises (Lingyu et al., 2011). While Hong Kong and Japan place a greater emphasis on secondary school entrepreneurship instruction, this is likely due to the governments of these two nations' substantial support for national-level entrepreneurial activities for youth (Wu & Wu, 2017).

Likewise for Indonesia. It is the world's fourth most populous country, with over 109 million school-aged children, or almost 42% of 255.5 million (Statistic Indonesia, 2015). This condition will encourage investment for quality in education, as reflected in some existing literature. For example, both Elqadri et al. (2016) and Mas (2014) highlight the significant role of entrepreneurship education in producing a highly qualified and competitive workforce through vocational schools. Various other studies emphasize a connection between Islamic religious schools and entrepreneurship education in higher education institutions (Alias & Musa, 2014) or discuss web-based entrepreneurship education courses available to the general public (Chang et al., 2014). Despite that positive development, one of the biggest challenges is that the national curriculum system in the country has focused on students' cognitive attainment (Darmaningtyas, 2004), not adding much to the topic of experiential learning in actual life (Joni, 2005). One has also critiqued obsolete instructional techniques that limit critical and creative thinking. Also, the number of entrepreneurship education programs is debatably lacking (Ghina, 2014; Larso et al., 2012). The situation creates a research opportunity to explore more insights into improving entrepreneurship education in Indonesia.

On the other hand, numerous studies suggest that design thinking can be a successful approach not only in business and entrepreneurship fields (Bruton, 2010; Dunne & Martin, 2006; Mumford et al., 2016) but also in management (Schlenker, 2014), engineering (Plattner et al., 2011), and many other educational disciplines. However, that application is primarily prominent in Western countries (e.g., Glen et al., 2015; Melles et al., 2012). Also, studies argue that much Western knowledge (including teaching methodology) is not universally and immediately applicable to different cultural entities (Hong Thanh, 2007; Retna & Bryson, 2005). Therefore, it is crucial to propose and develop a conceptual framework to describe the cross-cultural adaptation of entrepreneurial design thinking methodology from the Western to the Eastern education perspective.

Since it is a conceptual paper, the approach adopted by the authors reflects on the social-constructivist philosophy (Duffy & Jonassen, 1992) and integrates some prominent cross-cultural adaptation theories (Hofstede, 1986; Holden & von Kortzfleisch, 2004; Kimbell, 2011; Shafaei & Razak, 2016). This study provides critical insights into Indonesian entrepreneurship in higher education. The primary reason is that the practical teaching of entrepreneurial design thinking, as one of the most recent and innovative pedagogies for entrepreneurship education (von Kortzfleisch et al., 2013), is not yet well-spread in that area (Larso et al., 2012;

Soepatini, 2013). Additionally, this study's proposed conceptual framework aims to be a starting point for more research in the transfer and adaptation of knowledge and teaching methodology and contribute to the innovative teaching literature of entrepreneurship and design thinking.

2 Entrepreneurial Design Thinking: The Contemporary Western Teaching Methodology in Entrepreneurship Education

The concept of entrepreneurial design thinking combines entrepreneurship education and design thinking (von Kortzfleisch et al., 2013). Both approaches are well-acknowledged in Western academia (Glen et al., 2015; Nielsen & Stovang, 2015). The following is the basis of these two approaches.

2.1 *Entrepreneurship Education in Today's University Context*

There is no universal agreement regarding the goals of entrepreneurship education (Blenker et al., 2008; Gibb, 2002; Katz, 2003; Kuratko, 2005; Pittaway & Cope, 2007). Also, there have been numerous definitions and perspectives for entrepreneurship, yet there is a lack of an integrated research framework (Davidsson, 2005). Systematic analysis of the different themes within entrepreneurship education highlights three distinct outcomes. They enable an understanding of entrepreneurship, enhance graduate employability, and encourage graduate enterprise (Fayolle & Gailly, 2008; Gilbert, 2012; Hindle, 2007; Huq & Gilbert, 2013; Rae, 2010; Seikkula-Leino et al., 2010; Pittaway & Cope, 2007). Meanwhile, Patel and Mehta (Patel & Mehta, 2017) have described some critical thinking and action characteristics that should be embedded in today's university context of entrepreneurship education. They are value creation (Bill et al., 2010; Sarasvathy, 2001); radical collaboration and communication (Buchanan, 1992; Harrison & Leitch, 2008); being resilience (Dym et al., 2006; O'Connor, 2002); and the discovery-driven motivation (Kourilsky et al., 2007; Timmons et al., 2007).

Despite the progress above, “persistent deficits in certain non-technical competencies from graduates” are still being highlighted by universities and business schools (Jackson & Chapman, 2012, p. 96). Many of these weaknesses can be attributed to outmoded curricula, incorrect pedagogical practices, and a lack of opportunity for work-integrated learning (Jackson & Chapman, 2012). To better understand entrepreneurship education, it is necessary to define what “education” means for learners and the teachers in the circumstances of entrepreneurship (Blenker et al., 2008; Fayolle & Gailly, 2008; Gibb, 2002). However, it is also

crucial to acknowledge that the outcomes of entrepreneurship education are not achievable with a “one-size-fits-all” entrepreneurship pedagogy (Huq & Gilbert, 2017).

Nevertheless, most Western literature has identified several well-recognized teaching methods in entrepreneurship education (Amalia & von Korflesch, 2022). They are creating business challenges and real venture competition (Bridge et al., 2010; Lackéus & Middleton, 2015), which supports the broader application of entrepreneurial thinking and technology transfer (Lackéus & Middleton, 2015; Pittaway & Hannon, 2008). In addition, there are design-based approaches (Biffi et al., 2017; Lahn & Erikson, 2016), mentorship, and apprenticeship (Dominginhos & Carvalho, 2009; Mandel & Noyes, 2016). Those are unique methods of integrating creativity, exploration, and future-oriented thinking in entrepreneurship education and encouraging reflection of actual entrepreneurial experiences (Mandel & Noyes, 2016). The former is likely to be more concerned with the “content” of the instruction. In contrast, the latter follows the so-called “pedagogical reinvention,” which emphasizes the “process” and “method” of learning (Huq & Gilbert, 2017). The term “design thinking” is most commonly connected with a focus on student-centered pedagogy and its emotional function and abilities in the learning process. This method allows learners to move beyond only knowing and speaking to using, implementing, and doing (Neck & Greene, 2011). This key characteristic is a part of entrepreneurial thinking and action (Patel & Mehta, 2017).

2.2 Design Thinking and Its Linkage to Entrepreneurship Education

Design thinking is considered a relatively recent term in the business and entrepreneurship education literature, and it originated in the Western world (e.g., Brown, 2008, 2009; Dunne & Martin, 2006; Stanford, 2009). However, it has recently become even more common, which has spurred academics to explore this notion and its use in various educational fields (Sarooghi et al., 2019). They focus on the human-centered creation and evaluation of physical objects (Brown & Wyatt, 2010), which involves understanding people as inspiration, prototyping, building to think, using stories, and inspiring culture (Brown, 2008).

There are five essential attributes of design thinking found in the literature and related to entrepreneurship education. They concentrate on the individual and empathic (Dolak et al., 2013); team collaboration (Dorst, 2010, 2011; Stanford, 2009); experimentation attitudes (Brown, 2009; Lockwood, 2010); versatile and broad-spectrum mindset (Martin & Martin, 2009); and a strong mentality and personality (Hassi & Laakso, 2011). Accordingly, all design thinking processes enable divergence and convergence in all the phases and distinguish between spaces of a problem (i.e., phases of observing and understanding the problem and human-centeredness empathy) and a solution (i.e., generating ideas, modeling and

visualizing, and prototyping phases) (Efeoglu et al., 2013). Their work environments are similar to entrepreneurship: they produce artifacts (mocked up designs or organizational goods or services), apply empathy and a human-centered approach, and use creativity to address challenges (von Kortzfleisch et al., 2013).

Finally, entrepreneurship education has been one of the pioneering business disciplines in integrating design thinking while being a newer area of focus in business education (Dunne & Martin, 2006; Garbuio et al., 2018; Glen et al., 2014). It allows students to take a more constructive approach to learning, practicing, and integrating the knowledge and skills needed to follow an entrepreneurial path. Several progressions have aided the widespread use of design thinking in entrepreneurship pedagogy, including the opening of more new ways to move away from conventional teaching methods (e.g., business-plan writing) (Blank & Dorf, 2012) and contextualizing design thinking principles (e.g., the Lean Startup Reis, 2011) for entrepreneurship education and research contexts (Sarooghi et al., 2019).

2.3 Entrepreneurial Design Thinking

As explained earlier, design thinking is arguably comparable to entrepreneurship and can be used to solve complex challenges and uncover unexpected issues. The two domains are brought together in entrepreneurial design thinking. However, its profound literature is still primarily evidenced in the Western countries, for instance, Australia (Melles et al., 2012); the USA (Glen et al., 2015); and Denmark (Nielsen & Stovang, 2015). In particular, the term “entrepreneurial design thinking” is derived from the study of von Kortzflesch et al. (2013). It is a teaching method in the University of Koblenz, Germany, as a team-diversity-based approach for treating user-centered problems as entrepreneurial opportunities within an iterative process supported by creativity fostering tools and environments.

Moreover, entrepreneurial design thinking needs to be backed up by sound educational philosophy as a teaching methodology. According to studies, Lev Vygotsky’s (1896–1934) social constructivism philosophy serves as the basis for design thinking (Carroll, 2014; Leinonen et al., 2014). The design thinking teaching technique provides confidence in the creative talents through a system to hold on to when experiencing problems during the task (Scheer et al., 2011). This concept is similar to Vygotsky’s notion of scaffolding, in which teachers work as facilitators to help students reach their optimal standard of achievement (Lor, 2017). At the same time, because it stimulates multidisciplinary collaboration, the combination of teaching methodologies “entrepreneurship and design thinking” allows peers to assist with scaffolding (Glen et al., 2015). Design thinking is the missing link between social transformational pedagogy theories and the practical entrepreneurial application necessary in the business sector. The method allows for a holistic constructivist approach to complicated issues (Scheer et al., 2011). It consists of iterative cycles of construction and reflection (Rauth et al., 2010; Schön, 1983) that

can assist in the transition from traditional-content education to practical problem-solving.

Consequently, curriculum designers and educational leaders are increasingly required to sympathize with students as end-users (Lor, 2017). According to studies, contemporary teaching approaches should move away from complete reliance on textbook information (e.g., Booyse, 2010; van Merriënboer & Kirschner, 2012). Students take part as active participants rather than as an audience, and the role of the instructor transforms into that of a “learning facilitator” instead of an exclusive subject matter expert (Huq & Gilbert, 2017). Therefore, the pedagogy placed a strong emphasis on design-led experiential and collaborative learning, role-playing, and reflective analysis to provide students with the opportunity to develop skills for lifelong learning and the self-assurance to apply those skills in both their academic and professional lives (Conrad et al., 2007; Stefani, 2009). As a result, entrepreneurial design thinking may lead to a shift away from traditional knowledge transfer (teacher-centered) and toward developing individual capacity (student-centered) (Nielsen & Stovang, 2015).

3 Entrepreneurship Education in Indonesia

Establishing entrepreneurship education in Indonesia is arguably ineffective (Ghina, 2014; Larso et al., 2012). The mapping literature study conducted by Amalia & von Korflesch (2021) found that the current state of entrepreneurship education in Indonesia is relatively still in its infancy.

Most of the country’s entrepreneurial education programs are on Java Island (Amalia & von Korflesch, 2021). These programs use traditional teaching methods, where the usual lectures, case studies, and group work prevail. Although more modern teaching approaches (such as business mentorship, teamwork, and internship) have gained popularity, the conventional style remains popular.

In addition, supportive friends and family members or seeing and meeting successful entrepreneurs in the media seem to influence Indonesian students significantly to study entrepreneurship and become future entrepreneurs (Amalia & von Korflesch, 2021). Some prominent Indonesian higher education institutions offer mentoring business and entrepreneurial programs through mentorship to shape students’ entrepreneurial mindsets and provide them with fundamental business skills and knowledge (Larso & Saphiranti, 2016; Sembiring et al., 2011). There might also be a misperception of masculinity and gender discrepancy in entrepreneurship education (Amalia & von Korflesch, 2021). Low levels of education, difficulty obtaining credit to start a business, legal discrimination against female entrepreneurs, and limited family support are the primary reasons female students in Indonesia believe that successful “formal” entrepreneurial roles are more masculine (Firdausy, 1999; Tambunan, 2008). Moreover, when they become entrepreneurs in the future, they may be trapped in the “informal” entrepreneurial sector.

Another issue in Indonesian entrepreneurship education is a lack of understanding of teaching and generating skilled graduate entrepreneurs and acceptable approaches (Priyanto, 2012; Rumijati, 2017). Many Indonesian colleges continue to offer entrepreneurship as an elective course (Ardianti, 2009). Furthermore, one of the barriers is the country's hostile national atmosphere and culture to creating entrepreneurial social enterprises. Children from families with low incomes, who live in rural areas, and whose parents have a lower level of education are more likely to have parents who want them to leave school as soon as possible to help support their families financially (Global Business Guide, 2015). Consequently, the percentage of secondary school graduates who do not pursue higher education remains high. Furthermore, some cultural attitudes drive Indonesian college students to prefer working for the government or corporations over becoming entrepreneurs to achieve financial stability (Larso et al., 2009). The situation may deteriorate because the systemic educational regime does not equip students to be active societal contributors as entrepreneurs rather than largely passive shoppers (Soepatini, 2013).

Overall, developing entrepreneurship education in Indonesia has been challenging. The aforementioned perspectives on Indonesian entrepreneurship education are the critical considerations in proposing the conceptual “contemporary” teaching methodology of entrepreneurial design thinking to be implemented from the Western to the Eastern culture.

4 The Proposed Framework: Cross-Cultural Adaptation of Entrepreneurial Design Thinking Methodology from the West to Indonesia

Exploring the research of cross-cultural adaptation can be divided into two areas: a cross-cultural adaptation that involves “humans” (i.e., international students, sojourners, migrants, and expatriates) and the “non-humans” (i.e., knowledge learning transfer and distant learning theories). In general, theories concerning human adaptation accept that cross-cultural adaptation will cause stress to individuals. Some will remain the same (standardization), while others will be part of the new environment (adaptation). Kim’s theory is one of the prominent theories concerning this dynamic change process that happens to individuals upon relocating to a new environment (Kim, 2001). She clarifies that three main facets influence the successful operation of human adaptation, i.e., individual predisposition, environment, and intercultural transformation of both host country and sojourners. Nevertheless, more recently, the study of human cultural adaptation has moved from social-psychological education and medicine to the contemporary theories of cultural learning, stress-coping models, and social identification (Shafaei & Razak, 2016).

Exploring the cross-cultural dimensions can also be to non-humans, i.e., knowledge learning transfer and distant learning theories. For the former, the existing studies argue that much of management knowledge is prominently from the West and not universally applicable to Eastern countries or cultures (see Hong Thanh,

2007; Napier, 2006). Therefore, educators and curriculum designers must adjust when transferring that knowledge to different cultural entities. While for the latter, cross-cultural adaptation is necessary to change the learning and teaching method, primarily because technology development has led to the proliferation of Western academic knowledge and courses worldwide. Therefore, to embrace this modern era of digital learning, traditional offline teaching in Eastern countries may need to shift and adjust to online-based education from the West (Edmundson, 2006; Parrish & Linder-VanBerschot, 2010).

Additionally, studying cross-cultural adaptation is pertinent to understanding the cultural dimensions from geographical perspectives, i.e., Western and Eastern cultures (Liu, 2012). Hofstede's (1986) and Hofstede and Bond's (1984) five national cultural dimensions are the most frequently cited literature: power distance, uncertainty avoidance, individual/collectivism, long/short-term orientation with the Confucian Dynamism, and masculinity/femininity.

Power distance is the condition to which people in a community accept power disparity as a given in the organization. This degree affects formal hierarchy, where subordinates believe superiors have more power and are unquestionable. Uncertainty avoidance is how people who feel threatened by unclear situations have constructed beliefs and organizations to avoid them (Hofstede & Bond, 1984). Individualism/collectivism means caring for oneself rather than the group's priorities and standards. Confucianism substantially influences east and south-east Asian (including Indonesian) leadership styles and work behaviors. To focus on immediate outcomes, Confucian dynamism implies moral principles that include honesty for tradition, arranging connections by status, maintaining one's image (social reputation), and having a feeling of personal consistency and stability. Masculinity–femininity refers to civilizations where achievement, money, and possessions dominate society. However, femininity refers to cultures where compassion and well-being predominate (Bosma et al., 2009).

Liu (2012) further noted from the previous works of Hofstede that “self-reliance” is of the utmost importance to Westerners. They seek freedom; they want to make their own decisions and have little influence from others (i.e., individualism, long-term orientation, and masculinity). Asians (the Easterners) are accustomed to being in groups and value collaborative circumstances (i.e., collectivism, short-term orientation, and femininity). Therefore, it is critical to remember that East and West cultures are quite different and to recognize these qualities when teaching entrepreneurial design thinking across cultures. These cultural differences have ramifications for how local educators educate learners, and any advice should account for these distinctions rather than advocating a single strategy.

Furthermore, conceptualizing the “adapted” teaching and learning methodology from the Western to the Eastern countries, which focuses on the student-centered pole, is compatible with social constructivism (Zhu et al., 2010). Social constructivism emphasizes generating individuals' meaning through interactions between students and educators (Duffy & Jonassen, 1992). Nonetheless, despite the profound properties of social constructivism and cross-cultural adaptation theory, literature has provided little insight into the area of cross-cultural adaptation of teaching methodology.

Consequently, the primary aim of this current paper is to theoretically illustrate and describe how we can adapt the prominent Western teaching method/pedagogy to a different cultural entity, in this case: Indonesia. We primarily refer to the work of Shafaei and Razak (2016), in which they conceptualized the cross-cultural adaptation of international students who studied in Malaysia. They made a conceptual framework to represent the relationship and general concept of cross-cultural adaptation and a conceptual model to explain the cross-cultural adaptation mechanism. Besides, the well-known works of Kim's human cross-cultural adaptation factors (Kim, 2001), Hofstede (1986), and Hofstede and Bond's (1984) work on countries' cultural dimensions influenced this study. In this case, we conceptualized how individual (Indonesian students and lecturers) and environmental (university) factors can influence the process of cross-cultural adaption of the foreign teaching methodology. Such factors are students' and lecturers' preparedness to change and adaptive personality, their learning, teaching, and communication pattern, and cultural dimensions (Hofstede, 1986), as well as a university (setting, system, and culture) receptivity and conformity to change/adapt, respectively (Kim, 2001).

To illustrate how the cross-cultural adaptation process of entrepreneurial design thinking can happen, we refer to the study of Holden and von Kortzflesich's knowledge transfer theory (Holden & von Kortzfleisch, 2004). This paper argues that entrepreneurial design thinking is not being "transferred" as the term used by Holden and von Kortzflesich (2004), but instead "adapted" to different cultural entities. We acknowledge some of their theory elements as pertinent in cross-culturally adapting the western teaching method to Indonesia. These notable elements include socialization, externalization, combination, and internalization. The process may happen through socialization during the class and externalization can be done with the relevant stakeholders (university leaders, staff, and external parties). Then the possible combination of regular and new teaching methods and strategies, and finally, internalization through the curriculum system (Holden & von Kortzfleisch, 2004). See Figs. 1 and 2.

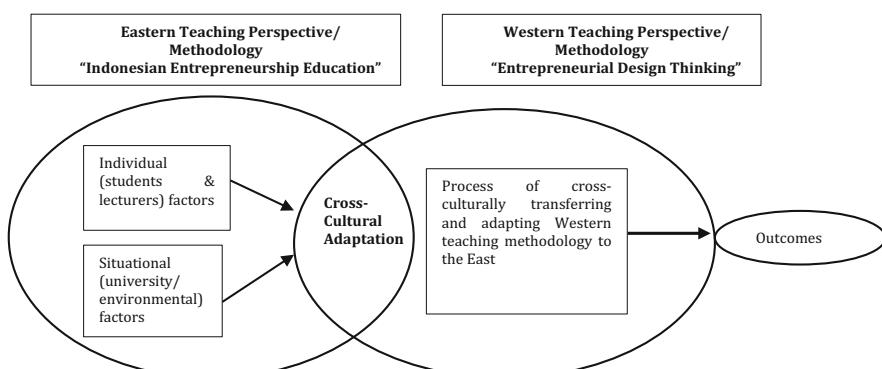


Fig. 1 Proposed conceptual framework for Indonesia

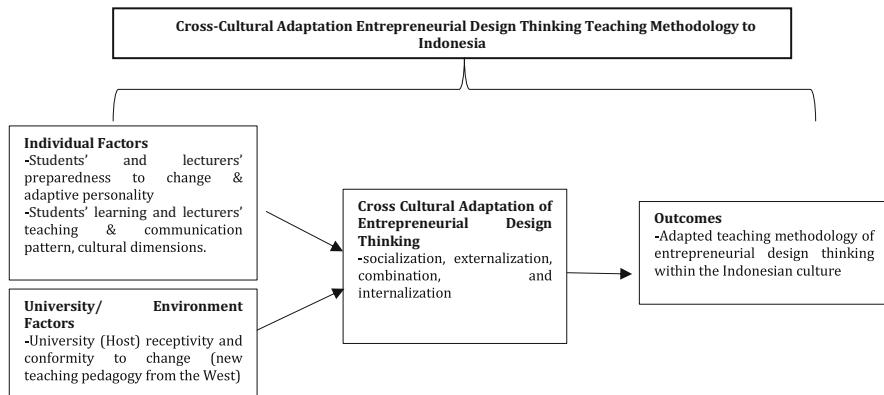


Fig. 2 Proposed conceptual model for Indonesia

In Fig. 1, our proposed framework conceptually represents the overall picture of how we conceptualized the cross-cultural adaptation of entrepreneurial design thinking in Indonesia. On the left side, individual and situational factors can influence the teaching and learning perspective of Indonesian students, lecturers, and university leaders in implementing entrepreneurship education in their country (see Hofstede, 1986; Hofstede & Bond, 1984; Kim, 2001). The right side illustrates the general cross-cultural adaptation process when transferring/adapting entrepreneurial design thinking from the West to the East (Holden & von Kortzfleisch, 2004).

Figure 2 is our conceptual model. We provided more components “inside” the earlier framework that explains the cross-cultural adaptation mechanism of how we can do the process theoretically. Finally, the intended outcome is the teaching methodology of entrepreneurial design thinking from the western that is adjusted and adapted to the characteristics of the Indonesian cultural perspective on entrepreneurship education.

5 Further Discussion and Conclusion, Implications, and Limitations

The conceptual framework and model developed in this paper propose a research insight into the area of cross-cultural adaptation to non-humans. They are adjusted and extended from the prior models (Kim, 2001; Shafaei & Razak, 2016), focusing on cross-culturally adapting a teaching methodology from the Western to the Eastern cultures. In particular, the earlier models/theories of cross-cultural adaptation to non-humans include two approaches: knowledge transfer theory (e.g., Holden & von Kortzfleisch, 2004; Hong Thanh, 2007; Newell, 1999) and online learning theory (e.g., Edmundson, 2006; Parrish & Linder-VanBerschot, 2010). The management literature connects them with the work of Hosftede (1980) in comparing

national cultures in terms of broad value differences (Hofstede, 1983, 1986). This study also uses Hofstede's cultural dimensions, similar to the earlier research.

Accordingly, Reeves and Reeves (1997) further argue that Eastern students will not have the same way of understanding meaning as the Western academics, managers, and teachers who compiled the knowledge. This idea means that the knowledge or teaching methods will not be understood or used if only translated into the East's language and culture. The same would be true if a Western academic translated a book on management into the language of a student from the East. In other words, the knowledge transfer from the West to the East is difficult because the students' tacit knowledge in the East is fundamentally different from the tacit knowledge of the West's academics, teachers, and managers. When making a teaching method, it is vital to consider the learners' cultural background (Wang & Reeves, 2007).

Therefore, this paper is a conceptual study intended to be an initial stage to propose a theoretical framework on how we can cross-culturally adjust a Western teaching methodology, i.e., the entrepreneurial design thinking methodology, to the Eastern cultures and countries case: Indonesia. By reflecting and employing the approach of social constructivism and cross-cultural adaptation theories, the proposed framework in this study is eye-opening. Here an outline of the implications of this paper that make it distinguishable from the previous studies is presented.

Unlike previous models/theories that only tackle knowledge transfer and online/distant learning, this study employs social constructivism and cross-cultural adaptation theories. This study aims to fill the research gap in the literature on how to cross-culturally adapted teaching methodology from the West to the Eastern cultures. Thus, the conceptual model proposed in this study takes a different route of looking cross-cultural adaption of non-humans (i.e., teaching methodology) from the perspective of learners, educators, and the university environment of the host country.

This paper provides strategic managerial insights, especially for Indonesian academicians, education policymakers, and university administrators, to improve its current entrepreneurship education by adapting the innovative teaching methodology from the West. Given the current competitive market of higher education and business schools in Indonesia, adapting an innovative teaching methodology (in this case: entrepreneurial design thinking) from the West can benefit the host country's educational institutions and perhaps the national system. The innovation of this teaching methodology is the adaptation to the cultural characteristics and perspectives of Indonesian students, lecturers, and the university setting.

This study also contributes to the rich literature of both entrepreneurship and design thinking fields by exploring and unlocking a new door for contemporary research themes focusing on cross-cultural adaption to non-human, i.e., knowledge and teaching methods. Nevertheless, since this is a conceptual paper, it is important to make these generalizations cautiously. Additionally, the proposed model may further need to be improved and empirically tested in the future.

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Progressing Context in Entrepreneurship Education: Reflections from a Delphi Study



Michael Breum Ramsgaard, Mette Lindahl Thomassen,
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Abstract Stimulating entrepreneurial agency among citizens, companies, and organizations is a central objective of many policymakers, potentially requiring arenas for innovation, networks of advisors, training, infrastructure, and finances, among other things. Nonetheless, central to agency is the individual's own willingness and empowerment to engage. Some aspects of entrepreneurship and entrepreneurial action have been argued to be broadly applicable across disciplines, geographies, and cultures, while others are significantly dependent upon a set of variables in which one is embedded. Thus, considering ways in which the contextual complexity of entrepreneurship (and education) is represented in entrepreneurship education is critical. Recent literature establishes that it is important to design for and with context in entrepreneurship education (Thomassen, et al., International Journal of Entrepreneurial Behavior & Research 26(5):863–886, 2020), but we lack documented knowledge regarding how this can and potentially should be done. In this chapter, we aim to progress a research agenda by identifying current challenges and future opportunities brought forward by experts in entrepreneurship education research through a Delphi study in order to advance the contextualization of entrepreneurship education.

Keywords Context · Learning design · Delphi study · Entrepreneurship education · Contextualization

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1 Introduction

The purpose of this chapter is to advance the discussion about context in entrepreneurship education. In dialogue with experts in entrepreneurship education research, we address the following: How contextual complexity is, is not, and should be considered and represented in entrepreneurship education. The chapter summarizes identified current challenges and future opportunities regarding the concept of context in entrepreneurship education in order to advance scholarly discussion of the contextualization of entrepreneurship education and entrepreneurship education research. As part of the Delphi study grounding this work, a recognized expert in entrepreneurship education research made a simple but central statement that illustrates the core issue: “What is *not* context” (Ulla Hytti). And another expert emphasized that context is not only something observed but experienced: “we as researchers and also teachers *do* context” (Bengt Johannisson). Such statements underscore the complexity, comprehensiveness, and underlying tensions when addressing context in entrepreneurship education. Context is everywhere—in time and space—permeating all sorts of organizing and structural frames, and is also co-created through interaction, whether intended or not.

When we consider education, we often consider the space of learning—particularly if we envision education taking place in a classroom. In a European society, a majority of us have some experience of this space—we can envision desks, chairs, and a figurehead often positioned proximally to a board or screen with mechanisms to write/share information. What we perhaps do not consider is what is brought into that space by the individuals situated there and how that influences the learning process. This is an issue not unique to entrepreneurship education, but the term entrepreneurship complicates this issue because each individual may have different perceptions of what entrepreneurship is due to its multidisciplinary foundations (Landström & Benner, 2010), positivistic propagation through policy (Verdijin & Berglund, 2020), and emphasis on heroic stereotypes (Steyaert, 2007). Furthermore, experiential learning, increasingly common in entrepreneurship education, necessitates that students interact with their context, making prominent the role and influence of context on education.

Context is intertwined and embedded in every aspect of doing research (and practice) in entrepreneurship education. It can be dealt with as aspects, parameters, or constituents, as well as seen as an underlying premise that in much of the literature has not been articulated or made explicit. Given all of this, why bother even trying to address something so overarching and broadly reaching? Because all the experts also agreed that context matters (in line with leading research by Welter (Welter, 2011)) and “we as researchers have a responsibility to point out what may be considered as context.” (Bengt Johannisson). So, we asked them (the experts), and we have organized their responses in this chapter with an aim of progressing a research agenda and through this also informing practice. The chapter pushes the frontier of entrepreneurship education research by (1) calling attention to the importance of context in entrepreneurship education research and practice, (2) identifying current

contextual influences on entrepreneurship education, and (3) proposing critical next steps to advance context in entrepreneurship education research and practice.

2 Method

The chapter builds on prior research regarding context in entrepreneurship education (Thomassen et al., 2020) and is based upon insights from a Delphi-inspired study of recognized experts in entrepreneurship education research. The Delphi method is widely used and accepted as an interactive forecasting method (Dalkey & Helmer, 1963). Recent applications have been used to expose the dark sides of entrepreneurship education (Bandera et al., 2020) and to forecast entrepreneurship in the future (van Gelderen et al., 2021). Our Delphi study consists of two stages. In Stage 1, experts respond to eight open reflection questions via an online survey. The answers to the survey form the foundation for Stage 2, focus groups. Focus groups are particularly suited for obtaining several perspectives on a topic while also gaining insights into shared understandings (Gibbs, 1997). We included focus groups to the Delphi design in order to reduce potential interpretation bias of survey responses and to accommodate the complexity of perspective when studying context. The focus groups draw upon and engage dialogue among experts in order to build from individual perspectives and then stimulate interactive discussion to connect and contrast experts' own thoughts. We argue that the inclusion of focus group dialogue is important to grasp the specificity of meaning and interpretation presented by experts.

2.1 *Selecting Experts for the Delphi Study*

We choose to take a European focus in our study to both consider the diverse yet somewhat integrated educational traditions of this region that are often overshadowed by a North American perspective on entrepreneurship, illustrated through common examples such as Silicon Valley, Steve Jobs, and Google. Taking a European perspective also serves to bind contextual complexities to a particular scope. To establish a qualified expert group, we invited all the surviving European Entrepreneurship Education Award recipients (11 between 2012 and 2021), representing Croatia, Denmark, the United Kingdom, Finland, France, Ireland, and Sweden. Three of the award recipients were unavailable to participate in the study. Given the potential geographical bias, we then requested recommendations from the initial expert group of prominent entrepreneurship education researchers from non-represented countries in Europe. The resulting group includes nine experts: Per Blenker, Alain Fayolle, Colette Henry, Ulla Hytti, Bengt Johannisson, Helle Neergaard, David Rae, Slavica Singer, and Roger Sørheim.

2.2 *Stage 1: Survey*

The survey included eight open-ended questions (see as follows) to which respondents could provide text-based responses, collected online using Survey Exact. Questions were designed by the authors building on previous research (Thomassen et al., 2020), taking into consideration a survey response time of approximately 10–15 min per question.

1. From your perspective, what constitutes context in entrepreneurship education?
2. What are the most commonly addressed contextual elements in entrepreneurship education?
3. What are the least commonly addressed contextual elements in entrepreneurship education?
4. Are there contextual elements that are taken for granted and therefore not addressed in entrepreneurship education?
5. What are the three main benefits of contextualization in/of entrepreneurship education?
6. What are the three main challenges of contextualization in/of entrepreneurship education?
7. As educators, what is the critical next step in addressing context in entrepreneurship education?
8. As researchers, what is the critical next step in addressing context in entrepreneurship education?

The survey responses were compiled and analyzed to identify themes, consensus and discords, and variance in interpretation. One set of answers was received after the deadline and was not included in the initial analysis that formed the basis of the focus group discussion but was included in the presentation of survey results. Complete anonymized survey responses were provided to the focus groups, as well as a compilation of responses, grouping various questions and identifying potential themes for discussion. The survey results had an important role in framing Stage 2 with the intention of building on and speaking to responses to be mindful of progressing the conversation about context.

2.3 *Stage 2: Focus Group*

The focus groups were conducted online via recorded zoom meetings. Seven of the nine experts participated in this step as two experts were unavailable. The experts were divided into two groups based on availability and gender representation. Each focus group lasted two hours, divided into four sessions covering a set of questions from the questionnaire, with complementary reflection questions. An agenda was formulated to ensure identified themes and questions were covered while still leaving room to follow the dialog and shared with the focus group in addition to

material from the survey. The author group decided on role distribution well in advance, as moderation of focus groups is significant (Gibbs, 1997). For the first focus group, one moderator ensured that all questions were covered and each expert was given a voice, while two observers took notes during the process and asked clarifying questions. For the second focus group, one moderator and one observer followed the same procedures.

The focus group recordings were transcribed for analysis. We then analyzed the text identifying key insights relating to earlier identified themes, illustrative quotes, and themes not present in the survey.

3 A Dialog with Experts

In the following sections, our dialog with and between the experts is presented. First, the condensed survey answers are presented, and then key insights from the focus group dialogues are presented relative to three overarching categories: language, time, and place.

3.1 *Findings from the Survey*

The first question in the survey asked experts to consider what constitutes context. The responses from the survey illustrated three main categorizations: a set of responses that considered context in regard to education and in regard to entrepreneurship in parallel; a set of responses that prioritized the context of education (at multiple levels), then considered through an entrepreneurial lens; and a set of responses that addressed a broader set of factors roughly associated to entrepreneurship, then considering learning associated to this phenomenon.

Questions two, three, and four, addressing common, uncommon (see Table 1), and assumed contextual elements, were compiled, with some themes emerging. However, it is important to note that in general, details and elaboration on the influence of elements are often lacking in the written responses. Commonly addressed contextual elements include the general (entrepreneurship and education) setting, how the venture is articulated, and the classroom setting. Less commonly addressed (if at all) context elements include culture, additional perspectives of value creation, educator influence, and variation in learning methods. In relation to what is taken for granted the assumptions of entrepreneurship described as new venture creation, from a business perspective is predominant. Moreover, assumptions about power, control, wealth distribution and influence, including the potential corrupt relationship between these, are also experienced as taken for granted. Often, the role of social media in (re)-construction of reality is accepted by default, given that it is

Table 1 Common and uncommon contextual elements in entrepreneurship education

	Common	Uncommon
General	<ul style="list-style-type: none"> – Geography – Discipline – Institution – Regulatory framework – Institution and faculty – Environment – Economy 	<ul style="list-style-type: none"> – Culture – Socially shared beliefs – Mutability of contextual factors – Interrelation of factors (e.g., discipline, occupational choice)
Venture specific	<ul style="list-style-type: none"> – Market demand/gaps – Finance and investment – Business models – Competitors – Industry structure – Resources 	<ul style="list-style-type: none"> – Social value (creation) – Environmental value (creation) – Cultural value (creation) – Common good
Learning specific	<ul style="list-style-type: none"> – Pedagogy – Didactics – Curricula – Type of students 	<ul style="list-style-type: none"> – Educator background and prior experience – Educator perspective – Didactics (ignored) – Learning methods (curricular, extra-curricular or mix) – Policies for education

not purposefully addressed. Moreover, the role of the educator and their own individual perception of entrepreneurship is rarely considered or made explicit. Furthermore, the assumption that all students will benefit from entrepreneurship education is a positive bias. Positive bias can contribute to a logic that entrepreneurship education can be delivered as one package for all students. Finally, the notion that formal education is the most “legitimate” arena for learning is also taken for granted with no regard to the stringency of classroom design. Experts brought forward different sides and perspectives regarding the learning arena—mentioning independent (private) organizations driving extracurricular entrepreneurial activity, and practice being argued as more relevant and informative than education and theory in this setting. Based on the focus group discussion, some contextual elements, e.g., didactics, are considered as both common and uncommon. This speaks to the need for additional specificity of what is meant by such elements, e.g. didactics. The experts drew attention to the issue that there are some aspects of pedagogy that are more standard to the practice of teaching and then, given this, context is considered in relation to what is generally accepted as part of the role, but then there are more specific methodologies that relate to entrepreneurship education (linking to the phenomenon of entrepreneurship) that has pushed other methods and perhaps also requires a mix of methods.

There was limited discussion on how a standardization/franchising of entrepreneurship education could be harmful (and in contrast to how entrepreneurship education could be useful). Moreover, responses emphasized influences from more macro-level elements, such as wealth distribution, policy, power/corruption, and the influence of social media. Finally, responses highlighted a general positive bias of entrepreneurship education being good for everyone and possible to apply in one form across different educational disciplines.

The benefits and challenges of context in entrepreneurship education (questions five and six) were mainly addressed relative to teaching practice and the legitimacy of entrepreneurship education. Benefits included the capacity of entrepreneurship education students/learners to be change agents. In this lies a focus on learners' acculturation and utility of sensitization of learners' awareness of context. The ability to adjust education to the level, discipline, or profession of the student was stated as another benefit of contextualization. Contextualization was articulated as having the potential to improve knowledge transfer from research to practice, including enabling differentiation from management, and rather perceiving entrepreneurship as practice (action orientation). Finally, responses emphasized the benefits of raising awareness of interconnectivity of contexts and contextual elements, including design, impact, and the uncertain nature of entrepreneurship.

Challenges for contextualizing entrepreneurship education are shaped by the way in which research design captures the influence of contextual elements. The lack of measures and frameworks that allow for comparison is influenced by contextual elements such as the difficulty of controlling the educational environment, limits of time and space within the curriculum, multiple perspectives within the educational system while also lack of means for interconnectivity, and "good enough" assessment levels instead of strict "grades."

Challenges also often mirror benefits, and this was exemplified in the discussions regarding the role of the student. Educators set fast on perceiving students as recipients of information was positioned as presenting challenges in addressing context. If seen as change agents, students were instead resources with the ability to design and influence the learning process. Also, the role of education, in being free or alternatively obligated to communicate context, creates the challenge of deciding which context element to consider also in distinguishing between what is general and what is distinct. The lack of measures, frameworks, freedom, and/or guidelines also complicates how legitimate different practices are seen to be, with concerns including relevance, cost and resource dependency, managing uncertainty, and setting boundaries.

Questions seven and eight addressed critical next steps in education and research to advance contextual awareness in entrepreneurship and are summarized in Table 2.

Table 2 Critical next steps to advance context in entrepreneurship education

	In education/as educators	In research/as researchers
Perspective and understanding	<ul style="list-style-type: none"> – Distance from “best practice” and “one size fits all” approaches – Increased emphasis on practice and practical ethical knowledge 	<ul style="list-style-type: none"> – The concept of the entrepreneurial situation (expanding beyond business start-up view) – The progression of learning relative to contextual influence
Design and assessment	<ul style="list-style-type: none"> – Create tools, frameworks, etc., to help with relevance – Use of teacher teams – Argue for freedom of design in education Challenge dictated directives – Access resources to enable and engage in research 	<ul style="list-style-type: none"> – New methodologies for studying entrepreneurship as practice – Measure efficiency, efficacy, and effectiveness of entrepreneurship education – Systematic analysis of contextualizing entrepreneurship education, encouraging pluralistic perspectives
Outcome	<ul style="list-style-type: none"> – Raise awareness – Emphasize selection – Recognize context as shaper of meaning/obligation of including context – Recognize connection/contribution to a multitude of stakeholders 	<ul style="list-style-type: none"> – Feed research findings back into teaching – Emphasize universities’ role in forming responsible and engaged citizens, including entrepreneurship conceived beyond just business start-up – Consider how we can and should scope context in entrepreneurship education

Survey responses advocate for educators to repel from the one-size-fits-all approach to entrepreneurship education and embrace pluralistic perspectives. Responses argue for a need to rethink the design of entrepreneurship education and for educators to recognize the responsibility of addressing context in entrepreneurship education.

3.2 Findings from the Focus Groups

Like the survey responses, the focus groups generated a multitude of issues considered by the experts as important to consider when addressing context in entrepreneurship education. It is beyond the scope of this chapter to highlight all of these. We have chosen to organize findings from the dialogues into three overarching themes: language, time, and place. In regard to language, we do not mean a national language or dialect, but rather a language used that may distinguish discipline (for example, business) and the distinctive meaning of a term situated in that discipline but also reflect social and cultural understanding. In regard to time, we consider not only past and present (both of the individual, but also from a historical perspective, shaping culture), as well as future—as imagined by the individual, but also as conceptualized through policy, politics, and society. In regard to place, we mean to include discussions addressing the learning space, at multiple levels, be it the classroom,

the institution, or the region and country, all of which carry with them various norms and requirements.

3.3 Language

In order to discuss context in entrepreneurship education, one needs to first consider, and make explicit, the perspective of/on entrepreneurship; and also the perspective of/on education. For entrepreneurship, this meant not only a definitional discussion of entrepreneurship, but also relative to the traditions from which that definition was premised—e.g., an economic vs. a managerial one—and then to consider how that has influenced where entrepreneurship education has been situated—e.g., in business schools and to some extent as a management discipline, but then with the objective to be broadly spread or applied (to or through other disciplines), often without necessarily explicitly clarifying the initial grounding. And then at times met with resistance because, for example, a perceived economic emphasis is not consistent with the educational objectives of, for example, nursing or the arts. Most of the experts agreed that the “business” veil of entrepreneurship (education) was problematic.

For example, one stated, “business schools usually focus their image of entrepreneurship on business issues, and in my mind that is a restriction . . . entrepreneurship is a much broader human activity than just being concerned with business” (Bengt Johannisson), and another stressed that as a research community, we need to “break this strong connection with that business and entrepreneurship education. In particular in the compulsory education” (Ulla Hytti). These perspectives draw attention not just to the perceived problem of entrepreneurship being too narrowly aligned with business, but also that there is a need to consider when the selected form of education is delivered in the educational progress of the learner—in compulsory education, higher education, etc.

A number of the experts emphasized the importance of language, including the misunderstanding that can come from interpretations building upon the contextual ground, particularly when not consciously connected to what is presented as context in the “classroom.” One expert expressed this: We “have to think about what is our vocabulary in the various context that we move around in” (Helle Neergaard). They discussed how entrepreneurship education is often connected to a predominant discipline, which then may or may not be explicitly presented. This is problematic given that knowledge is situated in the language it is presented in, which influences how it is understood (Steyaert, 2007). For example, just the description of the intended/expected role as a result of the education—entrepreneur, self-employed, entrepreneurial, enterprising, etc.—can both reach through or alienate the individual in the education, as well as carry with it associated meaning.

Somehow somebody has been able to ideologically construct sort of this idea of new ventures, start-ups and growth firms as the only sort of future context of entrepreneurship education. (Per Blenker)

Some of us consider entrepreneurship as practice. And then in order to ... demonstrate our responsibility for educating students, practical components in the training program or educational program should be included too, if not just make students aware (of) that kind (of) language that we use to tell what entrepreneurship is has to be positioned against how entrepreneurship is being done in practice. (Bengt Johannisson)

Getting research that actually show how we could do this kind of translation into different contexts. How we can be useful, and how we can develop things to get kind of co-creation, and not necessarily just research-pieces but also kind of "how-to-pieces" that we could share. (Roger Sørheim)

The dialogues of both focus groups emphasized the need for translation between and across disciplines to which entrepreneurship education is applied, as well as the distinction of what is considered more distinctive to entrepreneurship education as its own discipline. This is necessary to call attention to which contextual elements should be prioritized given the focused discipline, with its specific language and terminology.

3.4 Time

Experts made a point that context is carried through time by the interacting participants in a space, in a dialogue. Students in entrepreneurship education carry with them history and historical associations, as well as imagined and expected futures. The educational process and design also change over time, emphasizing the dynamism of the process.

The system is already sort of structured in time, you start at kindergarten, you go in to primary school, you go to secondary school, ... We don't do the same in kindergarten as in a PhD-course in entrepreneurship. ... typically we don't have specialization in the beginning of the system, and we have a lot of specialization in the end of the system. (Per Blenker)

Interestingly, there are different arguments for where in time to focus on entrepreneurship education.

I think the timeline is important, but we should view it as a timeline, in that everything in the context arises from the past. Whether it is as Per said, the educational system, the institutions, what we have done with the environment. All of that is historical and we are experiencing it now. (David Rae)

On the one hand, it is important to know the past to understand the present. However, a future focus was also advocated for: "context is also the future" (Slavica Singer). But it was discussed that entrepreneurs cannot change present trajectories and create new futures if they are bound by the past. Related to this, dialogues included discussion of the arc of the education for the student in regard to their process through the education. Both the learner and the educator need to be conscious of the progression of the student within or across disciplines, institutions, cultures, etc.

You start to reflect “We are doing this the wrong way” and you are starting to become more context-sensitive. And we are actually starting to lose the learners if you are not taking the context in to account. (Roger Sørheim)

Similarly, the teacher should be cognizant of their own arc across their “career” as an educator; in delivering the education, there is a learning that progresses and renews what is addressed in the classroom. This evolution in the classroom may occur at one rate, whereas the evolution of the university as a whole may be slower to adapt, considering to what extent the “entry level” of the learning should remain more static.

3.5 Place

A final organizing theme addressed how being situated in educational structures and regimes can signal or influence how context is considered. And also that these structures/regimes are only one of the situated learning spaces that students are positioned; the learning they are part of (perhaps particularly in action- and experience-oriented entrepreneurship education) spans beyond the classroom and into the life situation the student experiences around them.

[Learners] may take no conscious account [of] the economic situation, the political situation, the ecological situation and whatever it may be. They may be blissfully unaware of that. So, the educational aspect is in part enabling them to understand and appreciate, and be critically aware and be appreciatively aware of what that context is. (David Rae)

If we want to facilitate learning process, then we should understand in which context actually the learner lives in, and how he or she translates what they are getting from us, in order to deal with issues by which they are surrounded in their living context. (Slavica Singer)

These two quotes from experts also help to illustrate a tension—that the students potentially come into the classroom burdened in one sense with their “life situation” and at the same time mentally free from associating what is being provided in the education to the geo-political environment of which they are citizens.

Educators are both given room in their classroom to make decisions about what to prioritize, and at the same time, there are clear guidelines and objectives that are designated by university management and beyond. “One of the huge problems that we have is that the way that we teach entrepreneurship is partly dictated by what politicians define as entrepreneurship” (Helle Neergaard). Policies in part are to guide the development of a future workforce, but some of the experts pointed out that a limited awareness of the dominance of a particular language may lead to a marginalized proposed future behavior for those being educated:

... what future we are training for, and in that sense this dominance leading to an absence of other forms of entrepreneurial behavior and an absence of relevance and legitimacy and other forms of entrepreneurial behavior, which could also be present as alternative future context for entrepreneurship is extremely important. There is plenty of educators struggling with this, but there is also very strong political agendas. (Per Blenker)

In discussing the place of learning, the experts also brought forward discussion about digitalization—as both an equalizer and also a polarizer of access to knowledge, but also as something that fundamentally changes how education is/can be delivered and experienced.

... the digital context of being, of learning, of venturing, of being entrepreneurial of education [...] we take it for granted. Again, it's not static, it's not equal, we have probably all had this experience of Zoom or Teams or these different platforms, and people are struggling with actions from a different country, and actually being very very marginal, being very peripheral . . . (David Rae)

The dialogues of place also illustrate tensions around the intentions of entrepreneurship education—as being providing future opportunities, but perhaps inappropriately defined or marginalized by individuals various steps separate from the place of learning. And that the “classroom” is supposed to be a neutral “equalizing” space, but in attempts to adapt to certain elements influencing society (digitalization), can create barriers that exclude (lack of digital infrastructure, stable energy sources or required tools, etc.). “If you don’t have internet connection or if you don’t have laptop, then you are not equal situation with others to access education” (Slavica Singer).

simply by being aware of the context . . . That can give them agency, it can give them the power to work with it, to work with those resources and with that space. [...] Within that, a benefit I think is, I know this is a bit of a cliché, but providing that safe space, the learning space being safe space for learning for experimentation, for innovation, that failure is okay, failure is a part of the process of learning and creativity and innovation, because it is finding out what works, but also socially who you can work with and how you work. So, that to me is a benefit which is maybe a processual benefit of that process. (David Rae)

4 Advancing Contextualization in Entrepreneurship Education

This chapter brings awareness to the role of context in entrepreneurship education research and practice. The purpose is to improve educational designs by tailoring them with context sensitivity and bridging the knowledge gap of contextual influence in entrepreneurship education research and practice. Fundamental insights from the Delphi study illustrated the importance of raising awareness and looking at the intent and design of entrepreneurship education across disciplines, institutional boundaries, and through the entire progression of the educational process of both the student/learner and teacher/educator. One of the experts described the underlying importance of context in (entrepreneurship) education as follows: “in learning through context, they [students] are learning to be in the context as actors for their practice” (David Rae).

The discussion becomes larger than entrepreneurship education, in regard to how it is done, but also expands to discuss why it is done from a societal perspective, and that there may be a lack of critical reflection of the intended role of entrepreneurship,

and entrepreneurially capable individuals, in society: “what we are trying to do is somehow arguing against the dominance of the structural, economic elements and trying to introduce other sorts of systems of contextualization that has to do with culture, civil, society and sociological elements our struggles and so” (Per Blenker).

And experts recognized their own need to, from time to time, broaden their perspective in order to articulate necessary changes. For example, one stated how he had to respond to his university leadership, counteracting a “one-size-fits-all” desire of entrepreneurship education: “We have to offer different thing for different types/student groups with different types of learning outcomes” (Roger Sørheim). This echoes the leadership and responsibility other experts emphasized, while specifying that entrepreneurship education researchers need to take in dialogue with their institutions to help ensure that context is recognized and carefully considered when designing and delivering entrepreneurship education.

4.1 Some Reflections

The investigation into how contextual complexity is, is not, and should be considered in entrepreneurship education generates multiple paths for future research. What is commonly addressed from a general perspective relates to geography, environment, regulatory frameworks, institution, and discipline. Culture, mutability, and interrelatedness of contextual elements are uncommonly addressed, though recognized as powerful influencers in a learning process. Investigation also highlights common assumptions considering that entrepreneurship education resides around new venture creation and financial benefit, while value creation including social, cultural, and environmental perspectives is less common. In the learning space, pedagogy, curricula, and the discipline “type” of students are common considerations. Less common is consideration of (and self-reflection by) the educator in terms of how their background, experience, and perspective may influence entrepreneurship education, along with learning methods and policies for education.

This reveals that context is certainly recognized as influencing educational designs in entrepreneurship education, but there is less understanding or even awareness of in what ways, and by whom, this is done either intentionally or not. In the dialog with and between the experts, a number of contextual implications are articulated. First, translation from excluding to including language was advocated to consolidate meaning in learning designs. Another implication points to ways in which dialogue carries context through time by the interacting participants in a space. Finally, context also can be both constraining and enabling in entrepreneurial processes. Place dictates structures and resources, and didactical choices should consider/leverages this.

We chose a European focus in our study to consider the diverse yet somewhat integrated educational traditions of this region, which are at times overshadowed by a North American perspective on entrepreneurship, illustrated through common examples such as Silicon Valley, Steve Jobs, and Google. Indeed, such examples

also carry a success, growth-oriented, and ICT sector bias that again points questions at the broad applicability of these examples. Taking a European perspective also serves to bind contextual complexities to a particular scope.

Being a Delphi study of experts, the findings are of course also biased to the particular position of these actors, mainly as researchers in entrepreneurship education, but also educators, though some are now retired. As also emphasized by the experts, developing and understanding of contextualization in entrepreneurship education needs to include the voices of current educational (and training) practitioners, students, university managers, and policymakers. At the same time, it is recognized that these voices can and often do carry divergent views, and it is important to consider the responsibility of knowledge-bearing individuals and organizations to qualify what contextual elements to consider, recognizing that there may be a need to revisit who are deemed as knowledge-bearing.

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The Incorporated Approach: From Project-Based Learning in Entrepreneurship Education to Project-Based Learning as Entrepreneurship Education in German Schools



Bernhard Vollmar and Mark Euler

Abstract Entrepreneurship is a future skill that is of central importance for modern societies and economies. It has been recommended that Entrepreneurship Education, when defined as the scientifically founded discussion around the questions about how a central, lifelong, cross-sectional competence in entrepreneurship can be promoted, should be anchored early on in the socialization of learners, namely in schools as an essential educational practice. However, Entrepreneurship Education in Germany has not yet been implemented across the board and is still not mandatory in schools. This chapter illustrates how entrepreneurship, initiative, courage, and trust can be sparked in young people in Germany by using project-based learning as entrepreneurship education instead of project-based learning in entrepreneurship education. A concrete empirical example below of a school education initiative shows how this could be realized.

Keywords Future skills · Integrative approach · Projects · Schools

1 Current Relevance and Incentives to Promote Entrepreneurship as a Key Competence at the European Level: A Central Educational Task

Since the 1990s, a wide variety of developments, e.g., globalization, have led to rapidly increasing changes in both the economy and society. These have also resulted in enormous pressure to adapt to the needs of employees, companies, and

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entire economies. Western countries have recognized that they can only survive in this intensified competition with more modernization and more innovative companies. However, this presupposes that employees have very special key competencies in order to be able to be innovative or for innovative companies to be founded. In addition, employability must also be developed in such a way that workers can survive in constantly changing labor markets and social environments. In this regard, the Lisbon Strategy of the EU Commission from 2000 promoted key competencies that would be beneficial in the context of lifelong learning—above all entrepreneurship, creativity, and digital skills were highlighted as particularly relevant (The Council of the European Union, 2000). In the flagship initiative of the EU Commission (EU Commission, 2010) “Youth on the Move” as well as in the current “European Skills Agenda” (EU Commission, 2020), the importance of promoting these skills was affirmed. The OECD (OECD, 2019) confirms this with its conception of the relevant future key competencies and its various surveys of companies (Stifterverband für die deutsche Wissenschaft & McKinsey, 2020). The various recommendations and guidelines of the EU and OCED in this context pay particular attention to the dissemination and promotion of entrepreneurship education both in schools and universities.

The EU and the OECD have based these initiatives on an understanding of entrepreneurship, which does not only mean the establishment of a profit-oriented company but also as a general competence that involves developing ideas for society or the economy and the ability to implement them (EU-Commission, 2007). Entrepreneurial thinking and acting can also be demonstrated in the establishment of a social or eco-business, within the framework of intrapreneurship as an employee or as an “entrepreneurial self” (Bröckling, 2007), which realizes its own “business model you” (Clark et al., 2012).

2 Basic Design Recommendations for Entrepreneurship Education

The recommendations of the EU and the OECD also specify, among other things, how entrepreneurship education is to be didactically and methodically implemented. One idea is to integrate entrepreneurship or the topic of “creating new value” into existing subjects such as art, mathematics, language, technology, or economics and thus enable a recurring examination of entrepreneurship in different contexts (OECD, 2019).

In addition, “it is, however, absolutely necessary to foster a culture of entrepreneurship in young people at a very early age. (...) The earlier young people get involved in projects in which they can learn to be entrepreneurs in a practical way and act as good examples of the culture of entrepreneurship and of cooperation between individuals who share common goals and values, the better future results will be” (European Economic and Social Committee, 2013). In general, according to

these recommendations, the teaching/learning arrangements are supposed to have as much practical relevance and action orientation as possible, with project work being viewed as an excellent option (EU Kommission, 2006a).

From a scientific point of view, it appears to be fundamentally important that competencies such as entrepreneurship are not taught by instruction, but are developed in action. In this way, a restructuring, expansion, and updating of the individual's ability to act and self-organize takes place (Heil, 2007; Kaufhold, 2006). Therefore, entrepreneurship education that aims to develop long-term competencies requires a form of "enabling didactics" (Arnold & Gómez Tutor, 2007) and "macro-didactics" (Braukmann et al., 2009).

Following constructivist didactic approaches (Reich, 2004; Siebert, 1999), an enabling didactic assumes that knowledge does not only mean specialist knowledge, but also the understanding of processes and contexts similar to the concept of competence. This knowledge, in turn, cannot be generated intentionally, e.g., by "uploading" the relevant knowledge from the teacher to the learner in a mechanistic understanding. Rather, learning takes place in a self-organized manner in the learner whereby individual mental constructs are generated in a self-determined confrontation with the world. As an "enabler," the work of the teacher is to create as many different scenarios, opportunities, and framework conditions as possible for these self-determined learning processes to take place.

A macro-didactic conception, in turn, can support this by providing such learning impulses. It could offer not just a single learning location such as school or university, but, recurring on a long-term basis, at a wide variety of learning locations in a wide variety of contexts and subject areas. In this way, the learner is able to develop a mosaic-like overall pattern and actually learn a competence such as entrepreneurship.

The most recent Entrepreneurship Education Impact research supports these theoretical considerations (Nabi et al., 2016).

3 The Entrepreneurship Education Situation in German Schools and Its Causes, Development Needs, and Obstacles

In view of the challenges identified, the encouragement of a culture of entrepreneurial thinking, as well as the maturity and autonomy of learners, should be seen as a pivotal task of educational policy, especially in schools as a central educational and learning space (Aff, 2008). The competent management of life in modern society and responsible participation in it requires independence, flexibility, personal responsibility, social responsibility, and the ability to act (Loerwald & Kirchner, 2019). Education in earlier phases of socialization has a process-triggering and reinforcing role so that entrepreneurial thinking and acting can emerge in a longer-term process. This cannot only happen in professional life or during university

studies but has to be initiated earlier. The EU also refers to this in various statements (EU Kommission, 2006b).

Despite the considerate commitment to the development of new entrepreneurship education offers at the university level in Germany since around 1998, most of the action plans and recommendations that the EU Commission made to strengthen entrepreneurship education have not been implemented or have only been implemented in a rudimentary manner in the German school landscape. For example, an EU comparative study from 2012 in which 31 European countries were compared criticized that there was no nationwide “strategy for entrepreneurship education in general education” (Euridyce Report, 2012). This is also underlined by the Global Entrepreneurship Monitor (Sternberg et al., 2015), the study by the BMWI “Entrepreneurship in schools?!” (BMWl, 2010) and a current ranking of the development of entrepreneurial knowledge and skills in which entrepreneurship competence in relation to school education is evaluated as “very weak” by experts—and founders (KfW, 2020). All currently available teaching formats on the subject of entrepreneurship, such as JUNIOR, youth start-ups, Business @ School, etc. are voluntary. In addition, these exemplary learning experiences are unfortunately not usually embedded in any overarching theoretical and meaningful contexts. Such offers, therefore, run the risk of fragmentation and isolation (Krol, 2004), which prevents them from giving the learners a real chance to learn entrepreneurship competencies.

4 Entrepreneurship Education as Project Teaching: The Change of Perspective of the Incorporated Approach

If one now looks at project teaching in terms of its didactic and methodological foundation as well as its characteristics, together with the process and the competencies that are to be developed by it, it is noticeable that, in essence, it has exactly the same characteristics, competencies, and phases of the process that also characterize entrepreneurship as a key competence (EU-Commission, 2007). Here, too, an idea should be developed to solve a problem or to redesign and improve a situation. This idea then has to be planned, implemented, and presented in detail. To advance the situation of entrepreneurship education in German schools as identified above, a new perspective is being proposed, namely to move from “project-based learning **in** entrepreneurship education to project-based learning **as** entrepreneurship education.”

Project teaching or project work and project days are nowadays included in curricula nationwide. This approach is generally accepted as an action-oriented method for interdisciplinary teaching (KMK, 2021). In the past, teachers have not used this method in the way the curricula allowed them to. Petri (1991), for example, showed that only 0.5% of teaching time was spent on real project learning, although this seems to be changing now (Götz et al., 2005; OECD, 2009). On the one hand,

younger teachers tend to take a more constructivist didactic approach and use corresponding methods; on the other hand, the stricter legal requirement for more vocational orientation can be easily combined with project teaching. Project teaching will, therefore, be used more intensively in the future.

A project is defined as one of four main forms of teaching (Klafki, 1991):

A project represents the attempt made jointly by teachers and pupils to link life, learning and work in such a way that a socially important problem that meets the interests of those involved is dealt with together (= process) and leads to a result (= product) that has utility value for those involved. The aim is to achieve a balanced relationship between mental and manual work (Meyer, 2007).

By jointly choosing a topic or a problem in coordination with their teachers and trying to develop a solution or their own position for this in joint work, students combine their practical world with the forms of knowledge acquisition in school. The goal is the development of planning, problem-solving, social, communication, and self-regulation skills, as well as the development of self-efficacy and the courage to change (Knauf, 2009).

The project work itself is usually divided into the following phases (Lenzen & Emer, 2005):

- Initiation—Topics or problems for project work are sought and ideas for solutions or goals are developed.
- Introduction—The learners get more detailed information in order to be able to implement the idea.
- Planning—Tasks are assigned to persons, times, and specifications.
- Implementation—The project is implemented in practice, thereby solving the problem or achieving the goals.
- Presentation—The results are presented.
- Evaluation—The project is reflected on together.
- Continuation—Follow-up projects are initiated.

Consequently, entrepreneurship education can be integrated relatively easily by the following:

- Addressing the relevance of entrepreneurial thinking and acting at an early stage in the initiation phase of a project.
- Letting the learners clarify whether it is a one-time project or a long-term commitment and whether this should be a non-profit, for-profit, social, or eco-project.
- Not only dealing with the planning of the project, but letting the learners also consider to which target group the project will bring which benefits.
- Integrating well-known methods of entrepreneurship education, such as the Design Thinking approach, discussions with role models, simulations, prototyping, and testing in the corresponding project phases.

In order to build up an “entrepreneurial project culture” in schools, the following supportive arrangements, for example, could help.

- The establishment of a “project office,” which is designed similarly to a “learning office” and, therefore, enables the independent development and implementation of a project by learners.
- Infrastructural aids (material, project budget, rooms, etc.)
- A “culture of recognition” and “instruments of recognition” that also make the projects visible.
- Corresponding teacher training courses in entrepreneurship education and entrepreneurship education as topics in university teacher training.

It is also conceivable to design each teaching topic as a project or at least to integrate a project in each subject and thus offer a teaching/learning format for entrepreneurial thinking and acting in an interdisciplinary manner throughout an entire school time.

Overall, this approach appears to be a way of implementing entrepreneurship education in Germany not only in a quick and straightforward way but also as an option that better guarantees the development of a wide range of competencies in comparison to a special subject “Entrepreneurship.” In many cases, the school subject “economics,” which is currently only provided in a few federal states and, even then, only in selected school types, is viewed as the only systematic place for entrepreneurship education (Lindner, 2016; Loerwald & Kirchner, 2019). But this assessment results in a strong focus on economic knowledge. It neglects the cross-sectional significance and the relevance of action orientation, as well as the didactic-methodical knowledge of how competencies can be built up most sustainably.

Additionally, the common fear of a commodification of education (can be refuted and) should be enhanced by an understanding of education that is never acquired through instruction, but always only in active engagement with the world, which also includes the professional world (Blankertz, 1982). Even if Entrepreneurship Education is aimed more at the responsible person in the professional and economic world, it is essentially about the same issue, namely education for maturity, which “relates to the ability of the adolescent to be a responsible and independent subject” (Kutscha, 1995). This can also lead, among other things, to a more motivated, committed, and self-determined orientation and structuring of one’s own professional biography. A recent Kienbaum study showed that participation in activities or projects in the field of entrepreneurship education also increases the knowledge, skills, and abilities of students for a better professional orientation (Ivanova et al., 2018).

In summary, the proposed change of perspective may present a very easy-to-implement solution for comprehensive and effective entrepreneurship education at German schools.

5 Practical Example for Promoting Action Orientation in Entrepreneurship Education in Schools: A Modular Workshop Program

With the project “Circular Entrepreneurship Education in Schools of South Lower Saxony,” this integrated project-based entrepreneurship education approach is already being tested and implemented at eight schools in Germany via a modular workshop program. The content of the CEE program depicts the entire innovation process, from sensitization and the development of (sustainable) ideas through the creation of concepts and business models to actual implementation. The four modules are mainly implemented in the time slots for project teaching.

The four modules offered are the following:

1. Introduction to Entrepreneurship, Sustainability, and Circular-Economy: Here, the students are given knowledge about these topics and they are made aware of what these topics mean for them and their everyday life.
2. Idea Creation: In this module, the students should first identify a problem that they want to solve or find a product/service that should be improved. They then develop their own idea of how this could happen and check this idea for feasibility.
3. Business Modeling: In the next workshop, they try to develop an extended business model canvas for their idea and draw up a project plan.
4. Prototyping: In the last module, a prototype is built and a video is shot for an optional crowdfunding campaign. Both will be presented in the program final at their school.

Didactically and methodologically, the program is based on the EU requirements of the “Entrepreneurship Competence Framework” (EU Commission, 2016) as well as the learning cycle from Kolb (theoretical input, illustration, exercise, reflection) (Kolb, 1984). In the practical phases, an “entrepreneurial challenge-based learning” approach (Lindner, 2016) is pursued. This means that the learners have to master challenges in different contexts, thereby developing competencies such as (1) “analyzing,” (2) “developing ideas and strategies,” and (3) “implementing ideas.” In this way, they learn, among other things, creativity, self-efficacy, and multidisciplinary thinking and acting. In detail, action-oriented methods are used during which the teacher mainly takes the role of a mentor.

Thanks to the cooperation with the regional economy as a topic provider for ideas, service-learning tasks can also be assigned. Regional “green” start-ups are integrated as best practice examples as well. Additionally, a separate crowdfunding platform enables crowdfunding campaigns for student projects and therefore creates the opportunity to implement one’s own ideas and business models more easily. Another accompanying measure is the use of project offices in the form of learning offices, as described earlier.

The development of competencies in the key qualification “Circular Entrepreneurship” is ascertained and checked by means of competency diagnostics.

Since the first workshop on November 9, 2021, around 200 schoolchildren had taken part in the program by the end of 2021.

A total of 74 of these pupils have already completed the entire program. The evaluation of 55 self-assessment competence checks shows, among other things:

- 30.9% of the students are now more confident that they can make a difference to society. However, 5.4% think that their confidence decreased.
- 21.8% of the students say they are taking the initiative now more than before. On the other hand, 14.8% say that they are less willing to take the initiative.
- When asked about methodological skills, 32.7% of the students answered that they were now better able to plan a project, and 18.1% had a different opinion.
- Finally, in the final question about the overall assessment of their change in competence, 32.7% stated that they now feel more capable of developing creative solutions for social and economic problems together with others. Only 7.2% said this was not the case.
- What is also interesting about the results is that the biggest increase of entrepreneurial competence occurred among the students who completed the entire program in 1 or 2 weeks without interruption.

Initial interviews with 5 of the 15 teachers involved in the program showed that around 90% perceived their students to be more involved in the project work during the program than in the regular lessons. In particular, the option of being able to design lessons in a very practical manner and integrate them into the curriculum via project teaching was very much welcomed by the teachers and school administrators.

The project will run until July 1, 2022. Then a complete evaluation of all competence checks will take place. In addition, all teachers will be asked via the same competence check how they assess the competence development of their students. Guided interviews are then used to evaluate how they assess the program as a whole and what changes they propose. The success, which is already becoming apparent, has also led to inquiries about the program in other regions. Therefore, the program will be extended to those districts in follow-up projects.

6 Conclusion

In Germany, founding and innovating are typically viewed as difficult, risky, and alien. Thus, there are too few points of contact and thematic approaches that make entrepreneurship more feasible to a wider range of people. This should be addressed at an early stage, especially in school as a central educational and learning space, in order to ignite the entrepreneurial spirit. The entrepreneurial mindset can be learned. It is not genetically predetermined. An affinity toward entrepreneurship arises from experience, competence, and performance. It is important to promote this as broadly as possible early on in school. The earlier this happens, the better and more familiar the possibilities of entrepreneurship become for adolescents. Learning the path or the

entire entrepreneurship process from the idea through the concept to implementation for schoolchildren can, according to the format presented here, be consistently integrated and embedded in all school subjects via project teaching.

However, the first evaluations show that some basic conditions have to be considered. There are indications that students who complete all four modules within a week or two in a row show a stronger acquisition of competence in terms of commitment and self-efficacy than students who take the modules spread over the entire school year. Also, the commitment and enthusiasm of the teachers for entrepreneurship is an important factor. In addition, more detailed research is needed as to why some students perceived a relatively clear deterioration in some competencies.

As has been shown, therefore, the acceptance of the topic of entrepreneurship can be achieved on a broader basis, not just as a modern form of vocational orientation but also as a life orientation for young people.

Finally, as a further suggestion, the implementation of an integrative entrepreneurship education training strategy for teachers across the board at schools and universities should also be considered.

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Best Practice Considerations for Arts Educators When Developing Intensive Online Courses for Creative Industries Higher Education Students



Michelle Phillips and Ava Podgorski

Abstract The 2-year StART Entrepreneurship Project (StART) aims to support creative industries students to develop skills and utilise real-world experience to build successful and sustainable careers. UK-based and funded by the Office for Students and Research England, StART is a collaboration between the Royal Northern College of Music (RNCM), the Royal Central School of Speech and Drama (RCSSD) and University of the Arts London (UAL). The project involves the development of new in-curricular and extracurricular content and events, tailored specifically for students studying for higher education degrees in these and other specialist creative arts institutions.

This chapter explores one specific way of delivering entrepreneurship education to students, an intense period of contact time often referred to as a ‘boot camp’. The chapter outlines the planning stage of this event, including how existing research on entrepreneurial learning might be mapped onto the boot camp format and how aspects of the QAA (Enterprise and Entrepreneurship Education: Guidance for UK education providers, Quality Assurance Agency for Higher Education, Gloucester, 2018) guidance was to be integrated. The chapter will also detail how existing frameworks such as EntreComp (McCallum et al., Joint Research Centre Entrepreneurship and the creative economy (3):400–414, 2018) and the CLEAR IDEAS model (Birdi, European Journal of Work and Organizational Psychology 30(3): 400–414, 2021) informed design and delivery and how input from external industry partners and students themselves (both event participants and members of the StART Student Advisory Board) was a key part of the planning.

Keywords Entrepreneurship education · Enterprise education · Creativity · Arts education · Bootcamp

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1 Introduction

This chapter presents an example of a UK-based entrepreneurship boot camp for creative industries undergraduate and postgraduate students and discusses considerations for arts educators when developing intensive online courses for creative industries higher education students, in light of this case study boot camp. Hence, the context for this work is the UK higher education sector.

The most recent UK QAA guide (QAA, 2018) for higher education providers defines the terms ‘enterprise’ and ‘entrepreneurship’ as follows (p. 7):

Enterprise is defined here as the generation and application of ideas, which are set within practical situations during a project or undertaking. This is a generic concept that can be applied across all areas of education and professional life.

Entrepreneurship Education is defined as the application of enterprise behaviours, attributes and competencies into the creation of cultural, social or economic value. This can, but does not exclusively, lead to venture creation.

Others have written about the difference in these disciplines and potential implications for in- and extracurricular training in higher education (e.g. see (Sewell & Pool, 2010)).

However, at the heart of these terms, theories and distinctions is a drive to equip students with competencies which allow them to graduate prepared to innovate and to lead new ventures, organisations, businesses and initiatives. These entrepreneurial competencies, which may include both the so-called ‘hard’ skills such as budget management and ‘soft’ skills such as team working and networking, are important for every student. The European Commission considers key twenty-first-century competencies to include creativity, critical thinking, problem-solving, decision-taking, risk assessment and critical thinking (Penaluna et al., 2014, p. 365). In 2020 the European Commission produced a report on ‘creativity, a transversal skill for lifelong learning’, which states that ‘Creativity is now central to discussions about the key competences and core life skills needed today. It is relevant in all subjects of the curriculum and all aspects of life’ (European Commission, Joint Research Centre, et al., 2020, p. 3). Moreover, an independent review of the creative industries recognised that ‘Creative Industries represent a testing ground for ideas that could boost the ambition and productivity of all small businesses’ (Bazalgette, 2017, p. 21) and described how ‘As part of a broader UK government initiative, the Creative Industries were selected among the top 5 industries to drive economic growth in the UK’ (*ibid.*, p. 69). As the QAA (2018) guidance states, enterprise and entrepreneurship education plays a vital role in graduate careers (p. 3):

Learning about and experiencing Enterprise and Entrepreneurship while at university can have several benefits. It gives students alternative perspectives on their career options and ultimately, the confidence to set up their own business or social enterprise. Enterprise competencies will be useful to those in employment, or those who become self-employed and work on a freelance or consultancy basis. It can help develop a ‘can-do’ confidence, a creative questioning approach, and a willingness to take risks, enabling individuals to manage workplace uncertainty and flexible working patterns and careers. Enterprising

competencies, such as teamwork and the ability to demonstrate initiative and original thought, alongside self-discipline in starting tasks and completing them to deadline, are essential attributes that have been identified by employers as priorities. The potential for portfolio career trajectories also suggests that these learning experiences will support the needs of our students.

This chapter will use the term ‘entrepreneurship education’ throughout. This will be used in relation to entrepreneurial and enterprise competencies, such as those identified as key twenty-first-century skills by the European Commission. The activity discussed in this chapter, which is part of the 2-year StART Entrepreneurship Project, aims to facilitate the development of student skills in all areas of entrepreneurship and enterprise, from idea generation, to start-ups, to resilience and leadership. The term is used to encompass all interpretations of these terms discussed above.

1.1 StART Entrepreneurship Project and KickStART Creative Lab

Taking place between September 2020 and August 2022, the project coincided with the COVID-19 pandemic. Most higher education learning across the three partner institutions was conducted partly or solely online. The pandemic also impacted on other elements of the project, for example, the impact on the sector effected the ways in which students could work with new and existing industry partners. Along with the travel, hospitality and retail sectors, the creative industries in the UK were severely affected, with a projected £74bn turnover loss over the course of 2020 compared to 2019 (–30%) (Oxford Economics, 2020). For creative industry educators, the networks established to support programme delivery, for example, placement opportunities, were disrupted. The ongoing COVID-19 pandemic (and associated challenges) was a background feature throughout the planning and development of the StART project boot camp, for which planning began in January 2021.

1.2 Basis for Design

Despite the QAA guidance presented above, there is still a lack across the higher education sector in the UK of embedded enterprise and entrepreneurship content in degree-level education. Research undertaken by the Department for Business, Energy and Industrial Strategy revealed that, across the 2014/2015 academic year, only 4.3% of undergraduate students received any identifiable training in enterprise; less than 1 in 20 students received formal training in business skills as part of their degree (Price et al., 2018, p. 4). Such a statistic demonstrates that entrepreneurship education is not reaching the vast majority of UK students in higher education.

The boot camp format has been used by various higher education institutions, working with students on a variety of undergraduate and postgraduate degree programmes, to develop skills in entrepreneurship and enterprise. Maxwell and Ibibunni (2018) usefully describe such a boot camp as ‘an intensive programme designed for individuals seeking to think and act entrepreneurially’ (p. 60) and recommend in the conclusion to their study of young entrepreneurs in Nigeria that ‘entrepreneurs in turn should seize opportunities of boot camp programmes to gain more insight, knowledge and skill based on hand-on training received from mentors and successful entrepreneurs during the boot camp meetings’, given that ‘it is expected that the outcome of the boot camp meeting would result in many start-ups that will help to enhance the economic wellbeing of the nation’ (p. 70). Other institutions have also found this boot camp format to be useful in developing entrepreneurial skills. For example, Tih, Hussain and Hashim (Tih et al., 2019) found a boot camp for 118 postgraduate MBA students enhanced their ‘entrepreneurial thinking and skills, as well as team spirit and self-confidence’ (p. 240). Boot camps are usually extracurricular and are often made available to students across different degree programmes and disciplines, for example, the University of Cambridge’s ‘Enterprisers Programme’ (a 4-day residential entrepreneurship education programme, which ran 20 times up to 2010 and included more than 1000 students) and the University of Manchester Masood Entrepreneurship Centre’s ‘Researcher to Innovator’ programme (aimed at developing an entrepreneurial mindset in early career researchers and beginning with a 1-day boot camp). This opportunity to work with students from other departments and institutions was a motivating factor for students to enrol in our event. Similar boot camps have also been used to teach entrepreneurial skills to high school students, for example, students interested in computer science (Hickey & Salas, 2013). The boot camp model is used internationally in a variety of education settings and offered not only to students in school and higher education but also to professionals and individuals designing start-up businesses (e.g. Hasan & Koning, 2019), which discusses such a boot camp that took place in New Delhi, India, in July 2014). This kind of programme may also be offered as a short course by higher education institutions, for example, Imperial College Business School’s 10-week ‘Innovation: Design Thinking Live Online Course’, MIT’s ‘Innovation Leadership Bootcamp’ and Berkeley’s ‘Method of Entrepreneurship Bootcamp’, which is available for students and industry professionals.

What is clear from existing research and models is that this format has been found to be an effective way to train entrepreneurial skills (such as innovation). Furthermore, the boot camp model appears to be adaptable to a variety of different demographics and disciplines. However, frequently such events are aimed at business school students, those who already run businesses or lead institutions or all students in a (often large, multidisciplinary) institution. The StART Entrepreneurship Project boot camp intended to build on existing research findings, courses and models but to be specifically tailored to creative industries students at specialist higher education institutions in the UK. Creative industries students are some of the most likely to go on to lead freelance careers (Clarke & Trainer, 2021), and the need

for those embarking on creative careers to be equipped with skills such as being innovative, resilience, leadership and networking could be considered to have increased in the post-COVID world (when much of the creative industry is in need of rebuilding). Therefore, it is vital that entrepreneurship education which supports these skills is tailored to these students and their needs (e.g. managing their freelance careers) and available to all students during the course of their studies.

1.3 Designing the KickStART Creative Lab Boot Camp with a Focus on Its Audience

This boot camp was designed with the following two aims in mind, which were the aims of the StART Entrepreneurship Project:

- To develop and test good practice for delivering an entrepreneurial scheme relevant to the UK creative industries with a student-focussed programme, which will be transferrable and scalable across all arts and design higher education institutions (HEIs).
- To support the UK creative industries by developing students with the mindset to think ahead, work across disciplines, develop transferrable skills, network, collaborate with mentors and take charge of their own learning and careers.

In light of these project aims, the boot camp aimed to be relevant to students across multiple arts disciplines and to help develop a variety of skills associated with an entrepreneurial mindset.

Planning for the boot camp consisted largely of meetings with staff from all three institutions involved in the StART Project, who shared knowledge and best practice of their own experience in entrepreneurship education. Student co-creation was a core aspect of the StART Entrepreneurship Project as a whole, with students being considered as partners for many aspects of planning and delivery. Staff and students working together as colleagues was a key feature in our design model, and students were consulted extensively in the planning of the boot camp, meaning our target demographic for the event remained at the forefront of the planning stages. Student feedback emphasised what research had suggested, highlighting the need for this event to be an opportunity for cross-institutional and interdisciplinary collaboration. These sentiments echo that of Törnqvist (Törnqvist, 1983): Creativity flourishes when different specialities and competences are squeezed together on a small surface (p. 103). This is further evidenced by the boot camp themes, which were selected by our Student Advisory Board: connect, collaborate and create.

The boot camp was consciously designed to be accessible to all students studying at the three specialist institutions and inclusive of all student demographics. Another outcome of our close consultations with staff and students suggested that those students graduating in summer 2021 also perceived the boot camp to be of value (particularly given the disruption and uncertainty around creative industries careers

owing to the COVID-19 pandemic), even though they would no longer be students at the time that this was scheduled to take place. It was important that the boot camp was relevant for all students at all three institutions involved in the StART Entrepreneurship Project. As a result, the target cohort for this event included all undergraduate, postgraduate and recent graduates from the three institutions. The event was therefore planned not only to cater for those students already designing new businesses or enterprises (defined by QAA 2018 as entrepreneurship education) but to also support competencies including ‘creativity, originality, initiative, idea generation, design thinking, adaptability and reflexivity with problem identification, problem solving, innovation, expression, communication and practical action’ (QAA, 2018, p. 7). Such competencies are also core to specialist arts training, during which students are expected to be creative, to produce new innovative interpretations, to express themselves and communicate their work with the public and to generate new ideas, for example, for new pieces of music, stage productions or fashion designs.

Fundamental models and existing pedagogical principles employed in the design of the boot camp included the following:

- Design thinking—the design of the boot camp encouraged students to utilise the design thinking model which encourages students ‘to challenge existing norms and to test new mental constructs’ (Penaluna et al., 2014, p. 384). However, important here was reference to recent scholarship which critiques design thinking models and proposes new models which account for wider contexts and needs of creative industries students, such as Penaluna, Penaluna and Diego’s ‘Design-based enterprise assessment model’ (Penaluna et al., 2014, p. 386), which encourages ‘multiple ideas and flexible thought’.
- Prioritisation of the concept of creativity—creativity is central to notions of artistic identity and is also one of the competencies considered central to entrepreneurship. While historically creativity was regarded as uniquely an innate, artistic and often romanticised trait, it is now more readily understood as an ‘ordinary human ability that occurs every day and every-where’ (Bain, 2005, p. 30). Theories of how to train creativity have developed over recent years, using interventions such as events for children and within the context of the workplace (Birdi, 2016). These identify a rise in demand for innovation within professional settings, as companies recognise the need for creativity in organisational survival and financial prosperity (Anderson et al., 2014). Creativity may also be a useful term when framing entrepreneurship education for creative industries students.
- The notion of artistic identity, starting with students’ own beliefs and values, and the importance of ‘Enrol(ing) your students’ hearts’ (Jones, 2019, p. 53)—as Bridgstock (Bridgstock, 2013) notes, ‘For the artist, the practice of entrepreneurship is multi-layered, and qualitatively different from the practice of entrepreneurship in the traditional business sense’ (p. 125). It was important that the boot camp used terminology which felt relevant to creative arts students and which students felt was aligned with their own artistic identity. As Schediwy, Bhansing and Loots (Schediwy et al., 2018) have acknowledged, ‘Arts educators could

draw on this integrative predisposition by encouraging students to embrace both bohemian and entrepreneurial identity aspects and by helping them to accommodate their potentially disparate identities' (p. 193). It was also important that the boot camp established a 'safe space[s] for experimentation and failure' (Dobson & Walmsley, 2021, p. 340), which is considered key to creative development. Given this prioritisation of creativity and the potential conflict that the word 'entrepreneurship' may have with notions of artistic identity for creative industries students, the name chosen for the boot camp was the 'KickStART Creative Lab'. The boot camp therefore began by inviting students to introduce themselves and their beliefs and values.

- Principles emphasised in the EntreComp model and QAA guidance, student-led elements of the design, digital skills and idea generation—the registration form which students completed to attend the boot camp offered another opportunity for students to shape the design of the event and asked for their own self-report on which of the core enterprise behaviours, attributes and competencies as identified in the QAA (2018) guidance they considered themselves to be stronger or weaker in (see QAA, 2018, pp. 22–25). The specific language used was 'confident' and 'less confident', as this wording was felt to be more positive than strengths and weakness. These are highly interconnected and relate directly to the language used in other important entrepreneurship frameworks, such as the EntreComp framework (European Commission, Joint Research Centre, et al., 2017) but are thematically categorised and offer useful definitions that were included to help students reflect on their own skill sets and experiences prior to the event. The seven themes were creativity and innovation; opportunity recognition, creation and evaluation; decision-making; implementation of ideas through leadership and management; action and reflection; communication and strategy skills; and digital and data skills. Each student was asked to select up to three areas in which they felt most confident and least confident. Capturing these data proved useful when establishing groups for students to work in, as we were able to ensure that the event addressed skill areas which students felt that they were weaker in. For example, 68.8% of applicants selected 'digital and data skills' as an area they felt least confident in. This consequently shaped elements of the event, as we were able to include a keynote speaker from the field of technology enterprise, who spoke on the application of digital technologies in the idea testing and piloting stage of business start-up. We also included a networking opportunity with the co-founder of a company specialising in carbon-footprint data tracking for fashion brands. Furthermore, day 3 included a session where students worked in groups to represent their ideas in a digital format, for example, in a video or website. This also responded to what the creative industries students themselves had identified as an important skill that they currently felt lacking in.

The boot camp consisted of an introductory session and social activity on day 1 (Friday, from 5 pm), a day of practising skills around idea generation (in response to current industry challenges) and development on day 2 (Saturday) and a day of sharing these ideas (in digital forms—websites and videos—and also in professional

presentations and pitches) on day 3 (Sunday). A more detailed schedule is included in the appendix for this chapter. Most sessions took place in small groups with a number of students from each institution and two facilitators from differing disciplines and HEIs. The event contained three keynote talks, two of which were streamed live on YouTube to students who could not attend the whole event and also to members of the general public. Days 2 and 3 began with optional networking sessions using a free online platform ‘Wonder.Me’, which was tested by the Student Advisory Board for its functionality to be used in this context. The event concluded with a diverse panel of alumni (one from each of the three institutions involved in the StART project) to discuss themes from the weekend. As shown in the appendix, some sessions were optional, allowing students the opportunity to practice ‘self-awareness and self-efficacy’, which EntreComp classifies as a ‘resources’ competency within their framework. Building in moments for autonomy for students here was simple, yet important, and helped us tailor the event to the different experience levels.

Given that students had expressed a desire to develop skills around generating new ideas in response to creative industries challenges (e.g. the decline in live events due to the COVID-19 pandemic), we also used an established framework to help develop skills in this area. The first day of the 2-day boot camp introduced students to the CLEAR IDEAS model, which is a structured programme that acts as an ‘innovation training model’ (Birdi, 2021).

The following were also important underpinning factors when designing the event:

1.3.1 Access and Inclusivity

It was important for the aims of the StART project that the boot camp included all students at the three institutions and that this could be accessed by all students (e.g. by those students with commitments relating to part-time jobs and caring responsibilities and those students who identified as having a disability).

To ensure that the event was, and was promoted as being, open to all students, we ensured that the content of the boot camp would cater for all students, regardless of their experience of entrepreneurship education and competencies, and that no prior experience was needed. The event was centred around idea generation in response to creative industry challenges and hence allowed for engagement from students who were already planning start-ups and new initiatives but also those who were inexperienced in developing new ideas and taking these forwards.

To cater for disabilities and individual needs, the registration form asked if students had individual access needs which we should be aware of in planning the event. Students who ticked this box were connected to an accessibility specialist, who liaised with these students on a one-to-one basis and made recommendations to the organising team about how best to cater for any needs. There was also a separate strand of research and evaluation undertaken by a researcher with expertise in entrepreneurship education and accessibility. This included collection of both

qualitative and quantitative data, in the form of interviews with event organisers and survey questions given to students who attended the boot camp at the end of sessions.¹

We also took advice from one of the StART advisory board members, who had particular expertise in access and inclusion. Through consultation with the advisory board and students, we chose Zoom as the platform to host this online boot camp, as this was considered to be familiar to those taking part and to also be relatively accessible compared to other options (e.g. specialist conference software). Using an online format also allowed for everyone involved in the boot camp to include their gender pronouns in their Zoom name, which everyone was encouraged to do at the beginning of the event.

To help the event to be as accessible as possible, the two public keynote talks (which were streamed live over YouTube) were both live captioned (by a captioning expert) and live signed using British sign language.

In order to reach all students, including the graduating class of 2021, the KickStART Creative Lab was launched in May 2021, and recruitment marketing was sent out both at this time and in September 2021, when the new academic year had begun. A short promotional video was created, plus a professionally designed poster which was distributed over email and social media. This video ‘trailer’ used footage from previous online sessions at all three StART institutions, with a range of speakers representing different creative practices, businesses and perspectives, interspersed with engaging visuals and basic information to introduce the event.

1.4 Key Learning Points

The aims of the boot camp were that it should be relevant to students across multiple arts disciplines and should help develop a variety of skills associated with an entrepreneurial mindset. Student attendees fed back that they enjoyed working in cross-disciplinary groups; working on developing ideas; obtaining feedback on their ideas, presentations and pitches; the balance of talks and practical tasks; and opportunities to think about how to create positive change using their art and ideas. The boot camp was therefore deemed to have successfully met its aims and to have usefully contributed to the overall aims of the StART Entrepreneurship Project.

The following represents the main learning points from the event which we recommend are considered for future planning of any similar event (note that some of these are particularly relevant to the boot camp being delivered in an online format, and different learning points may have emerged if this event had been delivered in person).

¹Data from this data collection will be reported in a separate publication.

1.4.1 Allowance for Volatility in Number of Attendees Expected

Of the 149 students who registered for the event between May and November 2021, around half of these students engaged during the boot camp. Factors influencing student decisions regarding whether they engaged or not (having previously registered in advance) may include other weekend commitments arising, part-time job or freelance work commitments, students feeling under pressure with other course commitments or perceived lack of value of the event (see Jääskeläinen et al., 2020, for a discussion of factors which may impact on music students' perceived workload). For many creative industries students, weekends are likely to be a time when they have freelance work commitments. On the other hand, one of the benefits of an event where attendance is not mandated and flexibility in attendance can be accommodated is that this allows students to take charge of their own learning and base decisions about attendance on their own assessment of the relevance and interest of the event to their own learning and career trajectory. This self-awareness and self-efficacy competency links with the EntreComp framework (for guidance on how the EntreComp framework may be used in teaching, see McCallum et al., 2018). This volatility in engagement numbers is something the project is now looking into further as a research question, to better understand what might have impacted non-attendance.

1.4.2 Benefits of Cross-Disciplinary Working

Working with others from different institutions, and from different disciplinary backgrounds, was considered to have been hugely valuable by staff and students involved in the event. For students this offered a simulation of future workplace settings, and for staff it offered an opportunity to co-teach and learn from other members of staff (and students) from different institutions. These opportunities for knowledge exchange between higher education institutions are not usually a core part of day-to-day activity in the academic environment (Yusuf, 2008), but this boot camp demonstrated that they can be hugely valuable.

1.4.3 Appropriate Choice and Use of Technology

Ensuring that staff and students were familiar with and able to utilise the technology used for this online boot camp was an important element in the successful running of the event and the level of engagement. Initiatives used to help with engagement in an online environment included making use of breakout rooms and utilising the chat and poll functions for interaction and participation. Some students fed back that they would have liked some or all of the event to have taken place in person (COVID-19 pandemic restrictions allowing). However, we found that the event was successfully

delivered online, providing that thought had been given in advance to how to make the sessions as engaging as possible (and to allow for breaks away from the screen).

One other aspect of the boot camp which students fed back had been useful was the creation of an online hub of resources, which was shared before the event, available throughout and also available after the boot camp had ended. This online space was used for recordings of keynote sessions and to give access to key materials such as presentation slides and the timetable for the weekend. Students found that this hub allowed for flexibility in how they engaged with the event and the supporting materials, and also meant that they could continue to engage afterwards and to connect with one another.

1.4.4 Equality, Diversity and Inclusivity

One of the main learning points of the event was that we found it to be important to consider any barriers to the boot camp feeling accessible by all students (e.g. those with disabilities or specific learning needs) and inclusive of the entire student body. This was also important for the aims of the StART project and the sector need overall (as discussed above). The initiatives in place for the boot camp as outlined above were important in meeting these aims (e.g. consulting with students with additional needs beforehand) and would be a priority in planning any such future events.

2 Conclusion

The goal of this chapter has been to discuss the benefits and share best practice in relation to a creative industries entrepreneurship education boot camp delivered online. The chapter focussed on the KickStART Creative Lab boot camp event and explored the basis for this in existing research and QAA guidance and other similar activities and programmes in educational settings in the UK and internationally. Finally, the chapter summarised key learning points from the boot camp.

As has been outlined in existing literature, the boot camp format was found to be a useful method to help students to develop skills associated with entrepreneurship, such as creativity. Moreover, the prioritisation of creativity may be important not only for such activities with creative industries students but also in relation to other entrepreneurship education contexts. As Dobson and Walmsley (Dobson & Walmsley, 2021) outline ‘enterprise education is increasingly being seen as a highly creative pursuit of innovation and wider value creation, and is presented by many scholars as a departure from more traditional business venturing’ (p. 343). Also, prioritising artistic identity and meeting the students at their starting point (e.g. in beginning with skills around idea generation) were found to be important.

While engagement numbers were likely impacted by a multitude of factors, the students who did engage were consistent, and this suggests the boot camp model is suited to some learners and not to others. A particular area of success of this delivery

was the combined student and staff voice. Students were considered partners and key advisors throughout the planning of this event. It is hoped that this case study may provide useful guidance regarding how a boot camp for creative industries students may be successfully run in an online environment, while also prioritising access and inclusion. Our experience in running and evaluating the KickStART Creative Lab suggests that such a boot camp can have value for staff and students alike.

Acknowledgements The StART Entrepreneurship Project is a 2-year project funded jointly by Research England and the Office for Students in the UK.

Appendix

The schedule for KickStART Creative Lab.

Friday 5 November

Timing	Session
5.00–5.45	Intros and meet your groups
5.45–6.15	Social activity based on improvisation

Saturday 6 November

9.00–9.40	Facilitator planning meeting
9.00–9.40	Optional: Networking for participants and industry guests
10.00–11.30	Intro and starting activities
11.30–12.00	Break away from screen
12.00–13.00	‘CLEAR IDEAS’ keynote with Dr. Kamal Birdi
13.00–13.45	Lunch break (with optional entertainment content available on online hub)
13.45–14.00	Facilitators check in
14.00–15.00	Group session: Finding solutions, idea generation
15.00–16.00	Optional: Networking opportunity in Wonder.Me
16.00–17.00	Group session: Radical idea development
17.00–18.00	‘Building the perseverance needed to pivot’ keynote with Carl Thomas

Sunday 7 November

9.00–9.40	Facilitators planning meeting
9.00–9.40	Optional: Networking for participants and industry guests
10.00–11.40	Minimum viable product (MVP) in an hour session
11.40–12.00	Break away from screen

12.00–13.00	‘Creating boundaryless, sustainable careers: Putting to work your invaluable emotional capital as an arts entrepreneur’ keynote with Professor Pam Burnard
13.00–14.00	Lunch (with optional entertainment content available on online hub)
14.00–15.00	Groups work on presenting ideas
15.00–16.00	Present and reflect
16.15–17.15	Industry-led panel discussion with 3 guest alumni from different sectors in the creative industry
17.15–17.30	Thanks you and farewell

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What Can SMEs Learn from Universities?: Transferring Entrepreneurship Education Knowledge from the University to the Corporate World



Isabella Fitzky, Christina Lang, and Guido H. Baltes

Abstract Times of high dynamic and growing new knowledge demand for entrepreneurial education and university engagement. Higher education institutions (HEIs) have established intensive knowledge and resources about entrepreneurial education and relating activities and formats over the last years. As smaller companies (SMEs) are increasingly experimenting with entrepreneurship, they seem to struggle with setting up entrepreneurial activities within their established corporate strategy and innovation structures. It is beneficial for them to collaborate with higher education institutions to minimize the risk and uncertainty associated with implementing entrepreneurship education (EE) and catch up with larger corporates. Further, research lacks a systematic characterization of EE activities in those companies and classification of collaboration formats. Therefore, this study uses qualitative research methods to analyze data from interviews conducted with two German SMEs. Our study contributes to a better understanding of EE in SME and respective HEI collaborations by (1) characterizing EE in SME and SME-HEI collaboration based on attributes and collaboration types defined by their locus of collaboration and intensity of knowledge inflow and (2) identifying differences among EE in SME and HEI. We provide implications to practice—corporate and university EE initiatives—for a more effective design and implementation of EE in SMEs and the SME-HEI collaborations themselves.

Keywords Entrepreneurship education · Knowledge transfer · Collaboration · Small and medium-sized enterprises · Higher education

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1 Introduction

Developments like digital transformation and shift toward more sustainability (Kerrigan & Kulsooriya, 2020) lead to constant discontinuous changes. These changes tend to transform business models, ways of working, and competence profiles: business driven by satisfying customer needs, work driven by the greater purpose, and competence driven by creativity (van den Berg, n.d.; Thang & Tuan, 2020). While these changes offer many opportunities for emerging startups, they pose several challenges to the established world of business and work (Lyytinen et al., 2016).

Hence, entrepreneurial thinking and behavior have become a key prerequisite for companies of all sizes and individual employees (Kusa et al., 2021; Blanka, 2019). Systematically implementing entrepreneurial activities requires entrepreneurial spirit and comprehensive innovation skills to be strengthened among founders and employees—both prospective and current. In the underlying training process, high education institutions (HEIs) and companies take important roles alike (Schmelter et al., 2010). So far, it is mainly HEIs that have used entrepreneurship education (EE) as a widespread practice with which they aim to address current and future challenges and stay attractive to their different stakeholders (e.g., students, political supporters, business partners) (Bauman & Lucy, 2021; Ratten & Usmanij, 2021).

Established companies, however, are more and more under pressure to remain competitive—not only for new business but also for new talents (Kuratko & Audretsch, 2013). New types of innovation and organizational transformations are found to pose challenges for established companies as their organizational structures and approaches are mainly designed to improve the core business by increasing efficiency rather than to support entrepreneurial development (O'Connor & DeMartino, 2006; O'Reilly & Tushman, 2013; Elfring, 2005). To address this, it can be observed that companies are using entrepreneurial activities more intensively as a strategic tool (Selig et al., 2016; Tseng & Tseng, 2019).¹

Scholars have identified a variety of motives why established companies invest in EE activities, e.g., creating new knowledge, increasing their innovativeness, and developing new ventures (Schmelter et al., 2010; Schiuma & Carlucci, 2018). While larger companies have implemented a wide variety of “professional” entrepreneurial activities (Kulllik et al., 2018; Selig et al., 2018), like startup investments, company building, or incubating programs (Kulllik et al., 2018; Kruft & Kock, 2019), and thus accompanying EE activities, small and medium enterprises (SMEs) seem to face

¹We consider the concept of corporate entrepreneurship (CE) as focusing on formalized entrepreneurial activities that are intended by top management with the goal to support the creation of new businesses and organizational transformation, whereas we consider intrapreneurship as rather informal entrepreneurial activities that are driven by individuals without being mandated by the company or top management (Blanka, 2019). Since we only examined EE activities initiated by top management in our study, we embedded our consideration into the CE context.

difficulties in using entrepreneurial activities and upstream EE training. One reason might be their limited resources and strategic know-how (Schmelter et al., 2010).

Having their own requirements, we assume that SMEs cannot easily adapt to the approaches of larger companies. Collaborations yield potential for compensating for this gap for SMEs. One potential partner seems to be HEIs. Indeed it can be observed that HEIs and companies are working ever more closely together in this field (Schiuma & Carlucci, 2018). So far, the EE literature mainly describes the motivations and benefits of EE and the trainable entrepreneurial competencies of leaders in the context of companies. To revitalize and renew the organization (Hjorth et al., 2003), companies use EE to stimulate employees to be more flexible, creative, and passionate about their work (Höglund & Mårtensson, 2019) and develop relevant entrepreneurial competencies like innovative behavior, risk propensity, long-term orientation, and independence (Schuler, 1986). Thereby, a description of the actual design and prerequisites are missing.

Even though EE in companies seems to be a relevant topic, it has received surprisingly little attention in the EE literature. Reasons might be found in the missing cases or research methodology. So far, EE activities have been practically tried and evaluated in individual places, but empirical evidence for effective action is lacking. Concluding, further empirical research is needed to increase the understanding of EE for SMEs, in which aspects it may be different from the approaches in HEIs and how this can be well studied scientifically in EE. In initial collaboration projects with different SMEs, the startup initiative of the Konstanz universities has applied specific EE formats and tools to the corporate practice. Thereby, it became apparent that various adjustments are required in the design, organization, and usage of EE programs to meet the company-specific requirements. However, to effectively meet these requirements, more profound insights from the corporate context are needed. We propose expanding previous qualitative research evaluations based on grounded theory to gain these insights. The basic understanding of EE in SME is mandatory for specifically designing activities for EE and innovation in SME. For this reason, our study aims to investigate the following: *what characterizes EE for SMEs with HEIs and how is it different from the implementation in HEIs?*

2 Theoretical Background: EE in Established Companies and HEI Transfer

EE refers to all activities and processes aimed at developing specific skills, expertise, and attitudes required to act entrepreneurially regardless of whether this is achieved by creating a new venture or by innovating in established companies (Henry et al., 2005a; Hisrich et al., 2010). EE is fostered for a variety of purposes: primarily, to enable individuals to build new ventures, pursue new paradigms, and assume responsibility for future challenges, and secondly, to rejuvenate economies through entrepreneurship (e.g., boosting competition and innovation, creating employment)

(Matlay, 2008; Greene & Saridakis, 2007). The sought-after spreading of EE is mainly driven by HEIs' EE initiatives—supported by politics—and their intensive work on further expansion (Fretschner & Weber, 2013). Thereby, EE is realized through various and different activities like single in-class courses, whole study programs, or boot camps (Ilonen, 2021; Gedeon, 2014).

With the growth in interest in EE in practice, EE moved into the spotlight of research. Inspired by EE initiatives' evaluation processes, scholars strive to set up a theoretical concept using scientific methods, still searching for strategies to effectively analyze, systemize, and improve EE activities. A targeted review of the literature for the implementation of EE in the context of SME and HEI collaboration revealed three fields: (1) EE in HEI, (2) EE in larger and smaller companies, and (3) transfer of HEI knowledge into the innovation ecosystem.

EE in HEIs Research on EE in HEIs shows insights along with the steps of the impact model:

- Input level: optimal learning environments in HEI for EE (Ilonen, 2021), relevance and goals of EE programs and training, as well as respective content and challenges (Henry et al., 2005a).
- Output level: entrepreneurial learning regarding what is teachable, the effectiveness of EE different EE activities, and how to increase entrepreneurial intention, mainly focusing on single entrepreneurial courses/offering (Henry et al., 2005b).

Thereby, the analysis mostly take the student perspective. However, more stakeholders than only HEIs are involved in EE, like startup enabling organizations (e.g., accelerators, incubators, and similar) that focus on startups at various maturity levels, governments, and, increasingly, established companies (Schiuma & Carlucci, 2018; Corral de Zubielqui et al., 2015). Regarding the latter, the corporate perspective is considered the least. This is somehow surprising since today, it seems that almost all large companies use entrepreneurship to overcome their delayed responsiveness and to explore new knowledge (Elfring, 2005; Glinyanova et al., 2021).

EE in larger and smaller companies In their endeavor to implement different organizational forms for entrepreneurship like incubation, startup investment, or open innovation programs, those large companies have realized the relevance of EE as a means to strengthen their innovation capabilities (Kullik et al., 2018; Selig et al., 2018). They have started more or less experimental to include EE in their program either with learning by doing or external consultations in workshops or further HR training—not entirely unsuccessful as examples like the tech incubator hub:raum by Telekom show.

On the other hand, SMEs face more difficulties in systematically implementing entrepreneurial activities and upstream EE training due to a lack of resources and strategic know-how (Schmelter et al., 2010). As a result, the empirical findings on how to implement EE activities are mainly based on studies with large established companies (Glinyanova et al., 2021; Selig, 2021; Zahra et al., 2013) than on the context of smaller companies. Specifically for SME, only aspects regarding:

- (High-level) motivators for pursuing EE and similar activities are considered. This includes, for instance, the creation of new knowledge and increasing innovativeness (Schiuma & Carlucci, 2018).
- Suitable HR practices are considered, on the one hand, with a focus on the entrepreneurial qualifications of managers/owners and on the other hand to evaluate entrepreneurial competencies of potential employees (Schmelter et al., 2010; Gordon et al., 2012).

In summary, aspects regarding how SMEs train their employees' entrepreneurial skills are missing, even though it might be increasingly in their interest. Companies with an "entrepreneurial HR base" are better prepared not only to respond to the on holding market dynamics but also to take emerging new business opportunities (Schmelter et al., 2010). Even more, small companies must catch up, and indeed, it shows that increasingly small companies are also starting entrepreneurial activities. However, due to their specific characteristics, SMEs cannot simply adopt the approaches and experiences of large companies one-to-one.

One way to counter this challenge is to collaborate with partners. Partnerships have been found essential for SMEs to overcome size-related disadvantages and benefit from networking and collaboration (Corral de Zubielqui et al., 2015; Mackinnon et al., 2004)—especially with HEIs. Furthermore, as HEIs face similar resource challenges, collaborative projects offer the potential to effectively transfer university EE knowledge (Schiuma & Carlucci, 2018; Corral de Zubielqui et al., 2015). In fact, in practice, it can be observed that HEIs and companies are working increasingly closely together in this field. Thereby, the "right" collaboration setting has been found to be crucial for the success of partnerships between SMEs and HEIs (Schiuma & Carlucci, 2018).

EE transfer from HEIs to companies As of today, HEIs deliver EE through their entrepreneurship centers with specific programs and formats for creating more new venture startups and educating future talents (Finkle et al., 2013; Maas & Jones, 2017; Crammond, 2020), mainly manifested through education happening on campus. At the same time, transfer is part of the core understanding of HEIs, so transfer activities are established in various forms and areas such as technology transfer offices, science parks, or business ventures (Jongbloed et al., 2008). So it stands to reason that HEIs are also playing a key role in the entrepreneurial activities of companies, especially of SMEs (Mian et al., 2016). Transfer in terms of collaboration of SMEs and HEIs for EE seems to be closest using the resources and experiences of the HEI EE initiatives for the corporate context. It appears that a trend toward an increasing number of EE formats by HEIs for the corporate context can be observed (Schiuma & Carlucci, 2018; Gordon et al., 2012; Orazbayeva et al., 2019; Zhang & Hamilton, 2010). However, this transfer poses some challenges on both sides due to the different contexts, corporate versus academia, and that every company is individual.

Research on knowledge transfer from HEIs shows that EE knowledge is transferable (Blankesteijn et al., 2021) but not only considers the specific case between

company and university but refers to the general transfer of knowledge into the innovation ecosystem. These covers:

- Best practices for transferring EE knowledge between HEIs in different academic settings, like engineering and technology institutes (Qureshi & Mian, 2021).
- Motivations of SMEs to collaborate with HEI, especially in the field of entrepreneurship education (Schiuma & Carlucci, 2018).
- Potential advantages for SMEs through knowledge exchange between HEIs and SMEs (Secundo et al., 2019).
- Entrepreneurial ecosystems and the role of HEI and SME in them (Schiuma & Carlucci, 2018) and general university-business cooperation on innovation topics like new technologies, smart services, digitalization, IoT, and also entrepreneurship (Orazbayeva et al., 2019).

While traditional forms of collaboration such as sponsoring research projects are well established, in recent years, companies and universities have explored and used various new formats to make collaborations within local innovation ecosystems more effective. Examples include hackathons and idea competitions for students and companies, scholarship programs, and jointly sponsored conferences and workshops (Schiuma & Carlucci, 2018). In addition, SMEs have specific individual requirements for those EE initiatives and should adapt their programs when transferring (Orazbayeva et al., 2019). The many different perspectives from which EE is studied have resulted in various recommendations for action and programs developed (Ucbasaran et al., 2001). The format of collaboration should depend on the objectives sought through the collaboration of the SME and the university.

3 Methodology

This study follows an explorative, qualitative research approach to increase the understanding of how to describe and design the transfer between HEIs' EE initiatives and SMEs. Thus, grounded theory was integrated into an evaluation process with two cases to create new scientific, empirical insights into EE activities in SME-HEI collaborations. Our study is part of the corporate entrepreneurship research at the Institute for Strategic Innovation and Transformation Management (IST). Therefore, specific EE formats and tools of the Konstanz universities' EE initiative that have been adapted to the corporate practice in terms of collaboration projects with SMEs were examined.

3.1 Data Collection

Primary data sources include transcribed semi-structured interviews conducted with employees of the SMEs and an EE best practice company, as well as experts from the

HEI EE initiative. Each SME case contained at least one interview with representatives of the following roles: CEO, collaboration coordinator, and participant. In those in-depth interviews with open-ended questions, the following key topics were addressed: (a) motivations for EE activities and the collaborations; (b) implementation of EE, the collaboration, and related challenges; (c) individual motivators and barriers; and (d) background information on innovation management within the SME. We supplemented these interviews with observations and informal conversations during the activities. Additionally, we gathered secondary data on the cases to achieve consistent findings and thereby strengthen the validity of our findings. Those data included publicly available data on the investigated SMEs like websites, presentations, and social media posts.

3.2 Data Set

The selection of the companies to be part of the study is based on their active cooperation project in the area of EE with the IST. The cooperation relationships with the IST are in various stages of the process, ranging from the evaluation phase to the tested and established implementation of the EE formats. The interviewed companies are related to the automotive or healthcare industry. Further, the company size reaches from approx. 2200 to 2450 employees. The sample contained eight interviews that were conducted between 2021 and 2022. All interviews were conducted in German, recorded, and transcribed on 163 pages representing 355 min of recorded material with an average interview duration of 44 min. The shortest interview was 27 min, and the longest was 62 min.

3.3 Data Analysis

Our analysis aimed to identify characteristics of SME-HEI collaborations on EE. Therefore, following grounded theory principles, all interviews were openly and selectively coded by one researcher and discussed with the other members of the research team to establish a reliable coding system. We then categorized and clustered the codes to identify higher-level attributes. By mapping two attributes, we were able to identify different collaboration types that the attributes can describe.

4 Results

Our findings reveal that EE in SMEs and, thereby, collaboration with HEIs is a diverse and multidimensional phenomenon. The analysis of the case studies has resulted in a set of attributes describing EE in SMEs and in collaboration with a

university EE initiative. Using the two attributes of *collaboration format* and *intensity of knowledge flow*, distinct types of SME-HEI collaboration for EE have been identified.

4.1 Characterizing Attributes of EE in SME and HEI-SME Collaboration

Examining the cases resulted in a set of 13 characterizing attributes that can be used to describe EE collaboration activities with SMEs and HEIs from the perspective of SMEs. Examining these attributes resulted in insights and specifications for EE in SME and HEI-SME collaborations following five dimensions—strategic intention, condition, creation, collaboration format, and operative intention—and two levels, organizational level and individual level.

Figure 1 gives an overview of the assignment of the attributes to the clusters and levels.

Three of the five dimensions relate to EE in SME and the other two to EE in SME-HEI collaboration. For all dimensions, two attributes are assigned, except for condition with three. Additionally, the focus is mainly on the organizational level. We found that two attributes can also be discussed on an individual level, meaning that those attributes describe how employees perceive EE activities in SMEs. As participants are a part of EE activities, we further derived the (most dominant) motivation and challenges of individuals participating in the EE activities between SMEs and universities.

The attributes on a closer view show a wide variety of manifestations. To gain a better understanding of the design and usage of EE activities, a detailed categorization is provided in Table 1. Based on the findings in the study, the different attributes can be described in more detail by one or more variables, which can vary from case to case. For example, we identified the attribute “promoter role” in the dimension “intention for EE.” This describes who in the company is responsible for introducing EE activities. In our case studies, the variable “top management” was distinctive with exceptional support from the CEO.

4.2 Mapping: HEI-SME-Collaboration Types for EE

One central dimension identified in this study is the collaboration format design, which is defined by the locus of collaboration (internal, joint, external) and intensity of know-how inflow (high, low). Thereby, the manifestation of the other attributes seems to be related to this dimension. To unlock the resulting relations, we suggest a mapping step. Combining the locus of opportunity with the intensity results in six

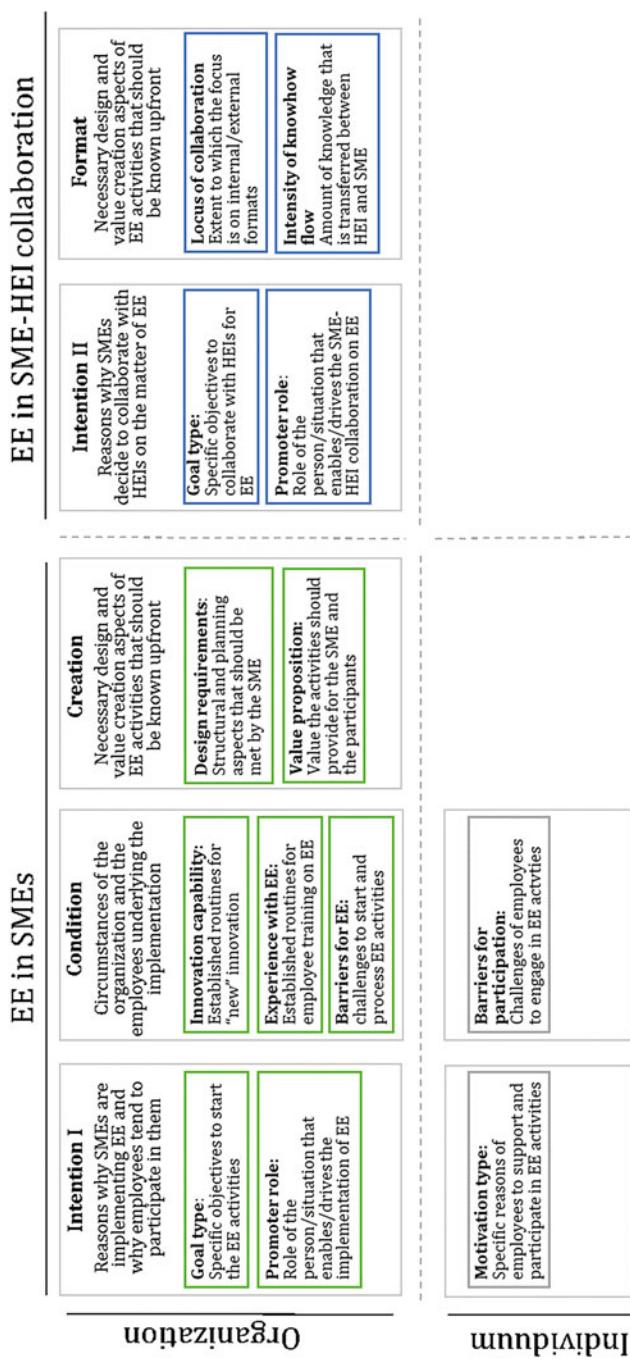


Fig. 1 An overview of the dimensions and attributes describing EE in SME and SME-HEI collaboration

Table 1 Specification of EE in SME and SME-HEI collaboration

	Attributes and variables	Description
Intention for EE (I)	<i>Promoter role</i>	
	Top management (CEO)	Implementing EE activities is driven by the top management with specific support from the CEO
	<i>Goal type (organizational level)</i>	
	Strategic renewal	Promote the reconfiguration of the whole organization toward innovation, transformation, and new growth fields as the core business might be at risk
	Insourcing new innovation approaches	Integrate new ideas/points of view and procedures into the corporate organization for new routines to generate new business fields
	Leveraging internal potential for new business	Activate employees' creativity, problem knowledge, and involvement in new ideas and their further autonomous development
	<i>Motivation type (individual level)</i>	
	Personality development	Develop mindset, skills, and behavior for innovation, i.e., to remain an attractive employee
	Acknowledgment	Gain acknowledgment from colleagues/top level by creating a visible reputation as an innovator
	Entrepreneurial actionism	Pursue personal goals by realizing own ideas or solving existing pains and problems
	Community member	Be part of a "special" group and accomplish tasks as a team
Conditions	<i>Innovation capability</i>	
	Innovation process structure	Before implementing EE activities, SMEs only used the traditional innovation process. Unrelated or completely new ideas had no existing process
	<i>Experience with EE</i>	
	Amount of EE opportunity	Existing opportunities for training and pursuing entrepreneurship in the SME
	<i>Barriers for EE (organizational level)</i>	
	Low awareness of employees	Insufficient information dissemination and awareness-raising to create visibility for EE activities and understanding of its relevance
	Core business prioritization	Day-to-day business in the core business is prioritized over the development of new ideas
	Technical specialists	Amount of specialized technical knowledge predominates methodological knowledge on how to deal with innovation and agility
	Limited investments with high uncertainty	Limited financial resources result in selective investments strictly according to the probability of success
	<i>Barriers for participation in EE (individual level)</i>	
	Limited "free" capacity	Participation in the activity creates additional time and work without compensation for it
	Team composition	Various levels of hierarchy now work together as a team on an equal level

(continued)

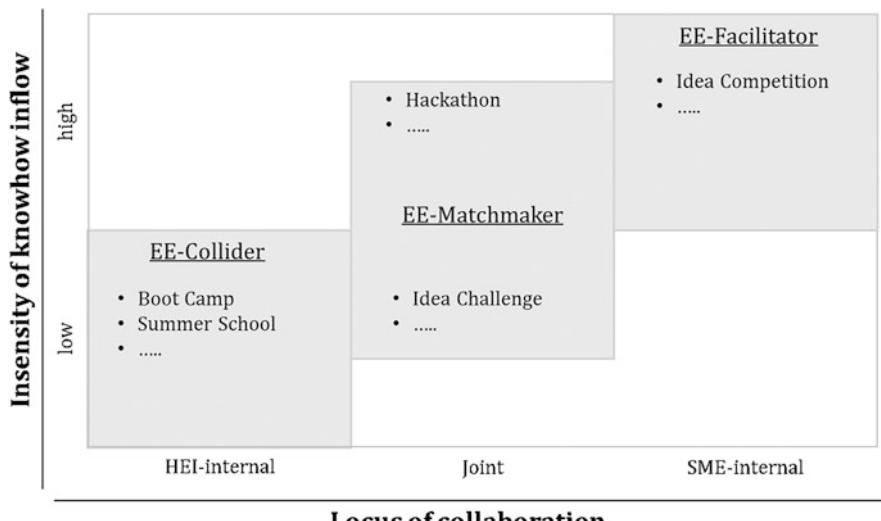
Table 1 (continued)

	Attributes and variables	Description
	Team building	Finding teammates and anxiety about being rejected lead to challenges
	Unclear objectives of EE	It is unclear why the company is implementing the EE activity and how these activities should be prioritized with the day-to-day business
Creation	<i>Key design requirements</i>	
	Ideation start	EE activities start early in the ideation process, ideally with idea generation
	Easy to access	Encourage participation in the EE activity with low entrance barriers and easy comprehensible tools
	Company culture conformity	Design and implementation are aligned with the company's culture, identity, and maturity level
	Scalability	Formats are scalable to be applied to the entire company and its respective size
	Multichannel EE offerings	Offer and visualize EE formats and tools on different channels (physical/digital)
	Fit company challenges	Match strategic challenges of the business portfolio or organizational structures
	<i>Key-value proposition</i>	
	Entrepreneurial community	Community with an entrepreneurial mindset, feedback culture, and mutual supporting
	Individual coaching	Personal support through mentoring, power promotors, and individual methods
	EE process	Transparent processes for EE activity with multiple topic-specific phases and scheduled milestones
	Customized methods	Adapted methods to the needs of the SME, flexible to address different know-how levels, and supported by mentors for expert instruction
	Resource availability	Dedicated, self-managed budget for the implementation of EE activities and resulting projects
	<i>Locus of collaboration</i>	
Format	HEI internal	EE formats take place at the HEI, and the SME provides input or a challenge question, but it remains without further guidance from the SME
	Joint	EE formats take place at the university. Methodological guidance is provided by the academic partner, while students, as well as employees of the SME, participate in the format
	SME internal	EE formats take place exclusively in the SME. The academic partner provides methodological support, and only the SME employees participate in the format
<i>Intensity of know-how flow</i>		
	Insourced EE know-how	Amount and what kind of knowledge on EE is brought into the SME

(continued)

Table 1 (continued)

	Attributes and variables	Description
Intention for collaboration (II)	<i>Goal type for collaboration</i>	
	Know-how insourcing	Guidance by academia in setting up a strategic innovation process by contributing know-how
	Self-determined and gentle intervention	Collaborations with universities intervene more gently than conventional consultations and allow the SME to self-determine and discuss the EE actions
	Coping with changes in core business	There is a high degree of uncertainty due to significant changes in the core business that potentially jeopardize it with which the SME must cope
	Access to new talents	The opportunity to recruit new talent with much-needed competencies for the company
	<i>Promoter role</i>	
	Workshops	Workshops in which the academic partner shares some initial expertise act as promoters of the SME for further collaborations
	Recommendation	Recommendations from other SMEs and partners who also cooperate with the university's EE institution

**Fig. 2** An overview of the HEI-SME collaboration types for EE

clusters, which can be grouped into three distinct SME-HEI collaborations for EE. By distributing the attributes along with these three types, we see differences in EE in SMEs and among the EE collaboration types (Fig. 2).

4.2.1 Type 1: EE Collider

Collaboration activities of this type take place solely in the HEI with inputs from the SME, which is provided through mentoring, coaching, validation of ideas, proof of concepts, or pilots. The company support can be either continuously through the idea development process (e.g., employees as mentors in a mentoring program) or for specific formats like summer schools with an entrepreneurial focus, entrepreneurship boot camps, or workshops at HEIs.

The main goal is to establish first contact points with EE for companies and to expand the companies' external network for future partnerships. Additionally, it is used to get in contact with future talents and get to know new approaches for innovating and working. These activities are performed outside of the corporate environment and therefore are not interfering with corporate structures, processes, and decision-making.

This selective collaboration is thus characterized by a relatively low transfer of knowledge into the company, leading to a lower impact on the SME. At the same time, this offers companies the opportunity to gain insight into entrepreneurial formats and to use student competencies and thought patterns. Students get "real" knowledge from corporate practice in entrepreneurial formats.

4.2.2 Type 2: EE Matchmaker

Collaboration activities of this type happen jointly between HEI and SME and are characterized by the active participation of company employees and students. Both parties are contributing in terms of knowledge, competence, and resources. Thus, joint EE collaborations result in a medium to a high amount of transferred knowledge into the company, depending on the design of the activities.

In turn, these respective designs are determined by the main goals for EE matchmaker addressing *changes in core business, insourcing novel approaches, gaining access to new talents, and strengthening collaborative relationships*. These activities are found to occur either inside the company, inside the HEIs, or at third-party places.

One format is "broad hackathons," where different companies propose their current problem statements, send corporate idea teams, and bring them together with students, resulting in co-creative new solutions, access to new talent, and entrepreneurial knowledge. Other formats like "single idea challenges" that last a weekend or even a whole semester, where a group of students addresses the issued problem statement of one company with the support of company representatives as sparring partners and mentors, also provide new ways of thinking and access to talent but insert less EE knowledge into the company. By working together on a specific problem, joint activities offer the opportunity for more impact on the SME than EE colliding.

4.2.3 Type 3: EE Facilitator

Collaboration activities of this type are only implemented within the company. Thereby, parts of the organization and individual employees are fully involved and influenced by the activity. The role of the HEI is found to reveal the current innovation capability, work out a common goal, and bring in experiences about possible procedures and tools to achieve the goal. This collaboration is thus characterized by a high flow of knowledge into the SME.

The EE facilitator aims to establish novel innovation approaches and company-wide training on EE. This seems to require strong motivators for EE and active promoters for EE and the HEI collaboration. This, in turn, means a total commitment from the top level and allocation of resources.

HEIs need a strong understanding of SME culture and unique requirements as the activity occurs in the corporate environment. An example of this kind of collaboration can be SME-internal idea competitions, which are adapted in structure and approach from HEIs to the needs of the SME. In these, employees generate novel ideas, for example, new products or use cases, which can be evaluated and possibly integrated into the portfolio of the SME. Therefore, the developed ideas must be strategically aligned and fit into the company's product scope.

5 Discussion

Little research has been conducted to date on EE in the specific context of SMEs. Our study and results contributed to a first understanding, which may serve as a foundation for further research to build a deeper understanding of this domain. The examination of EE in SME and SME-HEI collaboration shows a distinct picture regarding the intention, conditions, and creation for EE activities. Our results enhance the research on EE by identifying attributes and variables suited for describing EE activities in SMEs. In the next section, we will discuss the characterizing aspects of EE activities, followed by a description of the differences in EE in HEIs. Finally, implications for the SME and HEI EE initiatives will be given.

5.1 *Characterization of EE Activities in SME and SME-HEI Collaboration*

Organization attributes in focus Design attributes for EE in SMEs focus on companies' organizational level. One reason may be that organization-related aspects like process and structure are hard factors that are easier to identify and thus easier to design. Contrary, softer factors, including the individuum and the environmental factors, are more challenging to grasp and, therefore, more difficult to

address. The organizational dimensions of EE in SME manifest as an interplay of intention, condition, and creation for EE, which must not only be considered in themselves but how they are mutually dependent on each other. Depending on how they are designed, they provide a corresponding framework for individuals, which allows them to act entrepreneurially.

EE not yet a strategy tool Literature recognizes entrepreneurial activities as a strategic tool for established companies (Selig et al., 2016; Tseng & Tseng, 2019). Further, our findings indicate that EE is not yet an innovation strategy and management tool in SMEs. The lack of actual embedding in SMEs' strategic planning might be because their innovation focuses still on the core business with incremental product development. Thereby, completely new ideas required for future business development have no process yet.

Simultaneously, EE seems to be in the strategic scope as the CEO promotes its implementation. Thus, it appears to be important that the respective activities are culturally compliant and strategically aligned. However, SMEs are still in the phase of experimenting with this topic and have not yet implemented EE as a fixed part of their strategy.

Some barriers ahead To take full advantage of EE, SMEs must overcome several obstacles. This requires that established thought patterns (efficiency and exploitation) and priorities (daily business over the future business) are reconsidered and changed. The barriers on the organizational level and the individual level partly correspond with each other. For example, lack of awareness for the activities and limited communication opportunities lead to employees having an unclear understanding of the reason the SME is pursuing EE in the first place and what objectives are associated with it. Furthermore, prioritizing the day-to-day business is a challenge already for beginning to implement EE activities. However, this also manifests itself during the implementation, when employees lack the free capacities (time) to participate in the EE activities.

Intention As mentioned in the literature section, the motivations for EE in the literature are consistent with the motivators identified through the case studies. Furthermore, the drivers' *strategic renewal* and *insourcing of EE know-how* were additionally mentioned as motivators in the case studies. While SMEs try to exploit internal potential through EE activities to tackle future challenges, the motivation for collaboration with HEIs is different. SMEs collaborate with HEIs to gain knowledge and acquire new talents and viewpoints. Therefore, a distinction must be made between the motivation for EE and collaboration. Since SMEs are currently still experimenting with EE, it is essential for them to minimize the risk and the use of resources. As mentioned in the literature section, this is achieved through collaboration with HEIs, as they can draw on existing experience and share the risk and resource input.

EE collaboration needs configuration Depending on the intention for EE activities in SMEs, distinct types seem to be more suitable. If EE is part of the "new" innovation or even corporate strategy, EE facilitation is found to match these

requirements better. On the one hand, EE facilitation implies that the EE activities are initiated within the SME, which results in adapting their organizational structure toward an innovation-friendly environment to build up and use EE knowledge and thus realize the “new” strategy. On the other hand, with EE facilitation, the deep strategic innovation knowledge from the HEI EE initiative to realize company-wide innovation with EE is provided. On the contrary, EE colliding or matchmaking with a more company-external orientation would be less suitable as insourcing knowledge for a “new” strategy, while simultaneously outsourcing the relevant processes and structures seems opposed.

EE collaboration as a marketing tool EE involves different innovation competencies in terms of creating new ideas or using alternative working methods. Therefore, smaller companies seem to have understood that different ways of innovating and working are a new paradigm. So, EE is used (at least in part) by companies as a tool to attract and acquire new talents and thus establish their employer branding toward “being innovative.”

5.2 *Differences in EE Between SME and HEI*

Motivation individual In the area of motivation on the individual level, it appears that both employees and students participate in EE formats only if there is a primary intrinsic motivation. However, participants in the academic environment are significantly more intrinsically motivated, while those from the corporate context additionally require stronger extrinsic motivators.

Challenges individual We find one of the most significant differences between HEIs and SMEs when looking at the availability of time to participate in EE formats. While in the academic environment the time resources are relatively unlimited and the participants have a high degree of freedom in organizing their time, in SME, we find a substantial restriction of this resource and almost no freedom in terms of time allocation since all workflows are efficiency-driven and capacity-optimized.

Company culture conformity While cultural conformity plays a minor role in the academic environment, this point is highly relevant to SMEs’ design of EE activities. The methods and procedures used, specific linguistic elements in SME, and the visual design (corporate design) must be adapted and considered in SME. In the academic environment, the use of external media and the exchange of knowledge are firmly anchored so that the methods and the visual design of the activities do not necessarily have to be adapted to be accepted by the target group. However, a strong brand like the university design supports the acceptance of new offers.

Resources As stated out in the literature section, both HEIs and SMEs have limited resources (time, capital) as organizations. However, the perspective on EE programs and resulting projects differs as SMEs evaluate them much more by their prospects of success and the anticipated ROI than universities since the latter are more often

financed by external funding and the programs are thus not directly linked to value creation. The different financing structures of the two programs thus lead to another way of evaluating their profitability.

Know-How Another significant difference, which is the cornerstone of the attractiveness of transfer cooperation, can be found in the existing knowledge base. Explorative knowledge acquisition through research is an elementary core element of universities and leads to considerable methodological knowledge, which is almost wholly lacking in SMEs as they must allocate their resources in a very strategic targeted area.

5.3 Managerial Implications

This study has shown that EE is a multidimensional phenomenon with a wide variety of aspects to be considered when designing and implementing EE activities in SMEs. Therefore, we present different managerial implications.

5.3.1 Learnings for SME

Generally, the introduction of the EE activities in SMEs is performed step by step with local rollouts over a more extended period. If EE activities from the academic environment are transferred to the corporate, various adjustments must be applied. It should be noted that the design of the activities needs to address the company's requirements and the individual subjects.

Collaborations to transfer EE knowledge and formats must occur early and address future challenges associated with high uncertainty. If the issues are already severe, conflicts in prioritizing resources (time and money) will make successful implementation difficult. Prior to the implementation of the EE programmes, none of the companies studied had a point of contact for innovative and novel ideas outside the company's current business. Since the introduction of EE activities is a significant organizational change, it is essential to sensitize employees to the topic of entrepreneurship and to create an understanding of why the company is now introducing these activities. To do so, information flows and touchpoints need to be designed, for example, through physical illustrations of virtual tools or services. Even if various tools and knowledge sources are already available through the HEI, care must be taken to ensure that their design is aligned with the corporate design and fits in with the corporate identity to strengthen employees' trust in the tools and activities. The primary employees who participate in the EE formats are already encouraged by the motivators mentioned above, but the additional potential could be exploited if financial or material incentives were also offered as a reward for successful implementation. During the activities, it is essential for the participants to have a continuous contact person and to be guided. This support can occur

through mentoring, workshops, and other formats if it is both substantive and processual. Depending on the design of the EE activities, these can also include the development of new ideas and concepts. In this case, it can be difficult for the participants to transition from the idea phase to a project phase, especially if no financial resources or sponsors are available. Therefore, it is also essential to consider how participants can proceed after the EE activity.

Special attention must be devoted to the following aspects:

- *Communication* and knowledge transfer must be on an equal footing and in a spirit of partnership with options for action and scope for design for the SME.
- The *time required* for participation in the EE Activity must be as low, and knowledge transfer must be as time efficient as possible.
- The EE activities should be as simple as possible and use easily understandable tools to make *participation as convenient as possible* for employees.
- In addition to *intrinsic motivation*, participants must also be activated extrinsically, so it is essential to consider what motivates employees to participate.
- The EE activities should be based on the *progressive implementation of pilot projects* and organic growth. Nevertheless, the activities must be structured from the very beginning in such a way that they are scalable (low resource input, high number of participants).

5.3.2 Learning for EE Academia

When cooperating with higher education institutions, SMEs are not interested in classic consulting for current problems but rather in support in evaluating and overcoming potential challenges that may arise in the future and jeopardize the core business and sharing the risk associated with the establishment of EE activities. HEIs have accumulated a lot of knowledge on methods but not only methodological support, for example, in the form of toolboxes is needed, but also additional expert knowledge, which can be brought in, for example, by mentors from inside and outside the company.

While in the academic environment various independent activities can be offered to address the different knowledge levels of the students, SMEs focus on fewer activities that need to be suitable for more diverse target groups. Therefore, the offers must be adapted so that they can be used appropriately with different previous knowledge of a technical and economic matter.

SMEs are looking for a new field of application for existing core competencies and primarily are not looking for new core competencies. The future core business should use existing core competencies, making search fields in EE activities in SMEs more limited from the beginning. In contrast, EE activities at HEIs and the ideas developed are requiring less strategic alignment, which is vital for SMEs. Therefore, the backing of management and staff is essential, whereas, in the academic environment, there is more freedom to operate.

Special attention must be devoted to the following aspects:

- Knowledge of *strategic innovation processes* must be fundamentally provided. If necessary, partnerships with HEI institutions that have the methodological knowledge must be initiated.
- The *collaboration* should be structured through regular jour fixes, mixed working groups, clear contact persons, and responsibilities (distribution of roles).
- Paying attention to *cultural conformity* and being able to adapt individual solutions to the company (standard, unique part) are crucial. This can happen through adaption of visuals to CD/CI, used language, and special corporate terms.
- The *provision of knowledge* must be adaptable to allow to individually select and tailor the methods and tools taught to the SME.

5.4 Limitations and Future Research

In the nature of research, the emergence of limitations is inevitable. The presented results face the following limitations and opportunities for future research. First, by focusing on only two case companies, the question of generalizability arises; second, as the data set only contains case studies on collaboration between SMEs and on EE HEI initiative, we may have an inaccuracy in comprehensively characterizing the implementation of EE activities in SME and the associated collaboration with HEI. Thus third, the number and maybe even the specifications of attributes and variables could be different if more cases are considered. Fourth, some aspects are described in a biased manner, leaving room for narratives and interpretations, exacerbated by the retrospective view that is partially taken. A counteract may be a more longitudinal study that “on going” follows EE collaboration projects. Finally, the limitations of our results and conclusions toward generalizability and applicability in practice must be further elaborated by investigating a broader range of collaborations between other HEIs and SMEs.

Concerning the abovementioned managerial implications of this study, several opportunities for future research arise. First, examining the impact of the adaptation of the elements described above on cultural conformity would be interesting, as we suspect that not all elements affect perceived cultural conformity. However, perceived cultural conformity is particularly important for the SME. Second, we assume that the existing initial situation concerning existing innovation processes and framework conditions influences the SME’s motivation to establish CE and thus EE programs. Whether and in which form the catalyst for EE is affected by the initial situation should be investigated.

6 Conclusion

Transferring knowledge about impactful programs from academic settings into the corporate environment is one approach for benefitting from experiences made in the last decades. It can be observed in practice that universities and companies are working ever more closely together in this field (Schiuma & Carlucci, 2018). This chapter has examined how EE activities are designed in collaborations among SMEs and HEIs, thus strengthening the understanding of key requirements for the transfer and implementation of EE activities in SMEs. The investigated case studies resulted in characteristics in which we were able to identify various aspects where the underlying conditions in SMEs and universities are similar. However, characteristics were also found that differ and therefore make it necessary to adjust formats and activities if they are transferred to the corporate context.

SMEs can benefit from the transfer of EE knowledge in cooperation with universities of their enormous know-how in designing processes for strategic innovation, business development, and business model innovation through proven innovation methods. HEIs can use the insights from SMEs through collaboration to generate new knowledge. This includes what SMEs will need in the future and what entrepreneurial knowledge can be imparted to students to enable them to become intrapreneurs and, therefore, more valuable employees.

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Female Entrepreneurs' Motivations, Intentions and Barriers in Higher Education: A Case Study from Team Academy Bristol



Berrbizne Urzelai, Lauren Caple, and Samuel Watkins

Abstract The objective of this study is to examine factors contributing to entrepreneurial intention, motivation and barriers among female university students. For this, we take a case study approach and focus on a Team Academy undergraduate degree programme run in Bristol, UK, which bases its pedagogical model on student-centred, experiential and team-based learning where students use their team companies through 3 years to engage in real-world, trade-based activities and ventures and reflect on their learning by getting support and encouragement from team coaches and mentors. Data gathered through semi-structured questionnaires from female students and graduates of the programme since it was launched in 2013–2014 shows that entrepreneurial motivation, intentions and perceptions on barriers might have specific characteristics for entrepreneurial females in higher education as the reasons and ambitions are also influenced by their student identity, beyond their entrepreneurial identity.

Our findings highlight that the experiential-led nature of the Team Academy educational setting provides a supportive environment which facilitates enhanced levels of self-efficacy for female entrepreneurial students, i.e. their belief in their ability to start ventures is enhanced through their practical experiences of doing so during their programme of study.

While female students are in the minority on the programme, making up just 15% of the cohort, their entrepreneurial intentions remain strong or increase during their time at university, and they have a positive attitude towards the benefits of becoming entrepreneurs. However, our data suggests that female students may lack the confidence to take actions and risks, and the support network of their peers and team coaches is key in empowering them and helping to minimise self-doubt.

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The findings in this chapter inform changes within the programme and suggestions for future development of a more inclusive and diverse degree. The findings also have implications for entrepreneurship educators in further understanding the potential motivations, entrepreneurial intentions and entrepreneurial barriers of female students engaging in an entrepreneurial degree programme. This offers important considerations in terms of how inclusivity and diversity can be reflected in curriculum design.

Keywords Team Academy · Entrepreneurial motivations · Entrepreneurial intentions · Female entrepreneurship

1 Introduction

The current academic debate surrounding female entrepreneurs focuses on barriers and gender differences. As GEM report suggests in the majority of economies, new businesses are more likely to be started by men than women (Bosma et al., 2021). The ratio of female to male early-stage entrepreneurship varies across the UK regions, so care needs to be taken using the often-repeated statement that “women are half as likely as men to be starting their own business in the UK”. The UK female to male TEA ratio of 63% in 2019 is higher than in previous years (Hart et al., 2020), yet white males continue to dominate the entrepreneurial landscape (Pages, 2005). In terms of their motivations to start a business, studies suggest that females in the UK tend to be more motivated by making a difference in the world or earning a living than by building wealth and income or continuing a family tradition (DeMartino & Barbato, 2003; Hart et al., 2020). This, together with reports of female entrepreneurs being hardest hit by the pandemic, has shaped the current UK policy debate leading to a government pledge of 600,000 new female-run businesses by 2030. While these factors are undoubtedly true, the current debate misses “why” these females decide to be entrepreneurial by starting a journey of experiential learning in education.

This in context, the field of entrepreneurship education has been characterised by explosive growth given the importance of entrepreneurship in job and wealth creation (Koellinger & Roy Thurik, 2012; Lumpkin & Bacq, 2019). Not surprisingly, across the globe, entrepreneurship is taught to students at different levels and across many different disciplines (Jones & Iredale, 2010). Tiimiakatemia was developed in 1993 by Johannes Partanen at Jyväskylä University of Applied Sciences (JAMK) in Finland. Within entrepreneurship education, Team Academy (TA) is seen by some as an innovative pedagogical model that enhances social connectivity, as well as experiential (Kayes, 2002; Kolb, 1984), student-centred (Brandes & Ginnis, 1986) and team-based learning (Michaelsen et al., 2004). It also creates spaces for transformative learning to occur (Mezirow, 2006).

“If you really want to see the future of management education, you should see Team Academy”, Peter Senge (Senge, 2008) made this comment over a decade ago about TA, and since its inception, educators and practitioners engaging in TA-based programmes have continuously pushed at the innovation boundaries of more

traditional teaching approaches to education (Urzelai & Vettraino, 2022a; Urzelai & Vettraino, 2022b; Vettraino & Urzelai, 2022a; Vettraino & Urzelai, 2022b). TA is often referred to as a model of entrepreneurship education (Sear & Norton, 2012) and the way it takes the learning *through* approach (Hytti & O'Gorman, 2004; QAA, 2018). TA is seen as the flagship programme for the University of the West of England (UWE) in terms of being enterprising, and UWE TA has been recognised as a first and leading example of the TA methodology in the UK, achieving, beyond others, the Collaborative Award for Teaching Excellence from Advance HE in 2021.

Today Team Academy-inspired degree programmes exist within higher education institutions spanning four continents and many countries (Urzelai & Vettraino, 2022a; Urzelai & Vettraino, 2022b; Vettraino & Urzelai, 2022a; Vettraino & Urzelai, 2022b). On Team Academy programmes, learners create and operate real enterprises, and their learning is centred around their team company, a team of up to 20 fellow students that collaborate on projects and ventures and support each other's learning goals (Davies et al., 2022). Each team company is assigned a team coach, who supports learning through enquiry rather than instruction, and students are referred to as "team entrepreneurs" to emphasise the practice-led nature of the programme and to espouse the value of entrepreneurial mindset. Learners are required to engage in self-managed learning with support from others, namely, peers within their team company and their team coach. This involves a form of negotiated learning in which they are required to develop learning goals that align to their personal ambitions as well as the mission, vision and values of their team company, with regular feedback provided by their team coach and their peers.

However, "essential and interdependent" support functions that need to be in place for students making the transition into university education include not only cognitive support through course materials and resources or systems support from the institution but also affective support by creating a nurturing and supportive environment (Tait, 2000). You might expect that the team- and coaching-based experiential learning pedagogy adopted within TA would accommodate these functions, but the fact is that although females perform well and have higher pass rates and higher marks in the UWE TA programme, the number of females enrolled is much lower than in other business and management programmes. Since 2013, 364 students have joined the programme at UWE, out of which only 58 were females (15%). An average of 17% females enrol onto the UWE TA programme each year, compared to 42% for business management programmes since 2017. These are the future female leaders and entrepreneurs of the UK (Urzelai, 2021).

Therefore, this project aims to explore the intentions and motivations that young females have to become team entrepreneurs within a Team Academy setting and the barriers they face in their entrepreneurial journey.

The chapter will follow the following structure. We will first introduce the literature review on intentions, motivation and barriers that female entrepreneurs face. We then explain our methodology. After that we present our findings and analysis. The chapter ends with some general observations and conclusions.

2 Literature Review

Our chapter intends to better understand female entrepreneurship students in higher education, so for that purpose, we will focus our literature review in understanding female entrepreneurial intentions, female entrepreneurial motivations and the barriers and limitations that female entrepreneurs may face.

2.1 *Entrepreneurial Intentions*

In recent years entrepreneurship intention research has encompassed a wide range of topics including the impact of self-efficacy, entrepreneurship education and entrepreneurial role models. Scholars have argued that entrepreneurship does not happen serendipitously and comprises of a set of skills that can be learned (Bazan et al., 2019). Entrepreneurship education has thus received a lot of attention in relation to its influence on entrepreneurial behaviours and intentions (Bae et al., 2014; Opoku-Antwi et al., 2012). There is further evidence of the role of entrepreneurship education in improving levels of self-efficacy, which seems to be intrinsically linked to entrepreneurial intentions.

Researchers have examined the relationship between entrepreneurial intentions and entrepreneurial self-efficacy and found that gender had a strong effect on both, with males demonstrating higher levels than females (Wilson et al., 2009). Furthermore, it was found that, when viewed separately, gender and education did not have a significant effect on entrepreneurial behaviour, but when viewed together, they did. Furthermore, when factoring in self-efficacy, it was found that its effects overwhelmed the others. These relationships seem to demonstrate the important role that entrepreneurship education can play in increasing self-efficacy, especially in females (Palmer et al., 2015).

A previous study has examined the impact of gender orientation on entrepreneurial intentions (EI) among university students (Palmer et al., 2015). Having studied an entrepreneurship course was a significant predictor of EI for females but not for males (Palmer et al., 2015). The authors suggest that entrepreneurship education may have contributed more to entrepreneurial self-efficacy in females than for males, particularly in the cases where females had fewer vicarious entrepreneurial experiences than their male counterparts. Knowing an entrepreneur was a significant predictor of male EI but was unrelated to levels of female EI. This finding seems to support the need for female role models in entrepreneurial contexts (Palmer et al., 2015).

Exposure to entrepreneurial role models and self-efficacy as a predictor of women's entrepreneurial intentions (EI) has also been explored (Austin & Nauta, 2016). In a study of 620 female college students in the US, higher levels of self-efficacy and a larger number of entrepreneurial role models within one's network were associated with higher levels of EI. The intensity of interactions with role

models was also associated with higher levels of EI (Bae et al., 2014), thus emphasising the importance of meaningful connections with entrepreneurial role models for female nascent entrepreneurs.

Entrepreneurial intention can be further understood by considering the Theory of Planned Behaviour (TPB) (Ajzen, 1991), which suggests that personal attitude (a favourable or unfavourable evaluation of behaviour), subjective norms (perceived social pressure to perform or not perform a behaviour) and perceived behavioural control (perceived ease or difficulty of performing the behaviour) are antecedents of entrepreneurial intention.

2.2 *Entrepreneurial Motivations*

Entrepreneurs need to have confidence in the future and their abilities to start a business, but it is also sensible to assume that the COVID-19 pandemic might have had an impact in the start-up's motivations. Some authors define four categories of entrepreneurs' motivations (Sulikashvili et al., 2021):

1. *Intrinsic motivations*: when the individual entrepreneur carries out their activity for the satisfaction it provides in itself, and not for any consequence that results from it. The commitment is spontaneous, fuelled by the interest, curiosity or challenge and the activity of creating.
2. *Extrinsic or instrumental motivations*: any commitment in an activity with the aim of achieving any result associated with it. Motivating activity is only a means, or an instrument, to achieve something else. Obtaining a reward and avoiding a sanction are the most common examples. It is not the activity that motivates the individual but the prospect of a reward or the fear of a sanction.
3. *The need for independence and autonomy*: the individual creates their company to be free from all external constraints, to be independent and to have full control of their life at work. The individual is at the origin of their own actions.
4. *Safety and well-being of the family*: a significant contribution to the well-being of the entrepreneur, their family, their community or the territory.

Women are more motivated by autonomy, achievement, a desire for job satisfaction and other non-economic rewards, but the desire to make money is not, however, an unimportant motive (Cromie, 1987). So, they are usually more motivated by intrinsic factors.

In the context of the UK, studies found that building wealth was the stronger motivation, while continuing family tradition was ranked the weakest motivation, but females tend to evaluate both factors much lower than males and are more interested in what, for them, makes a difference in the world or to earn a living (Hart et al., 2020). Women are less competitively inclined than men in almost all countries included in the sample and are also less willing to take risks (Bönte & Piegeler, 2013). More detailed work found that having freedom, greater flexibility, challenging oneself and fulfilling a personal vision were the most popular motivations for

females in the UK (Hart et al., 2017). Males tend to place economic gain as the primary motivation for starting a business, whereas females oftentimes go into business for themselves in order to achieve a more favourable family-work-life balance (DeMartino & Barbato, 2003).

However, it is important to note that although there is a strong gender effect on some motivational factors, gender itself needs to be examined along with other social factors to understand differences in motivations (Humbert & Drew, 2010).

2.3 Barriers and Limitations

This research has analysed entrepreneurial barriers that female entrepreneurship students faced before and during their start-up process. These were classified as “societal barriers”, “infrastructural barriers” and “behavioural barriers”. Our research recognises the extrinsic nature of these barriers and the interconnectivity they rely upon.

2.3.1 Societal Barriers

Gender stereotyping confines women to have qualities that are less likely to be associated with entrepreneurship (Hentschel et al., 2019). Accordingly, self-stereotyping by FEs may negatively influence their intentions to enter this field (Gupta et al., 2009). By “thinking entrepreneurship – thinking male”, it becomes apparent that the defining characteristics of the stereotypical entrepreneur are effectively those which define masculinity (Marlow, 2004). Implementing a broader view of stereotypes that considers congruence to gender identification deconstructs this stereotyping (Gupta et al., 2009).

Besides, much of the literature on entrepreneurship argues that sociocultural factors such as fear of failure, perceived opportunities or role models are the most important drivers of entrepreneurial behaviour (Arenius & Minniti, 2005), especially in the case of female entrepreneurship (BarNir et al., 2011).

2.3.2 Infrastructural Barriers

Gender-based discrimination causes women to experience barriers to acquiring financial capital in the form of loans, as measures used to determine creditworthiness have been based on masculinised norms such as domestic circumstances (De Andrés et al., 2021).

There is a lack of women in entrepreneurship, and this, therefore, affects social capital and access to resources. Female business networks are sparse and are found to either be too competitive or male-oriented (McGowan et al., 2015). Thus, there is a lack of sufficient and beneficial mentoring for females. This is compounded by the

notion that a young woman cannot be successful both entrepreneurially and domestically simultaneously (Sandberg, 2013).

As a result, there is a perceived irrelevancy of female entrepreneurship as an option within the educational system – perceiving entrepreneurial endeavours as inappropriate for young women, thus stopping the self-confidence necessary for the development of an entrepreneurial career. However, the further women progress through the system, the more likely they are to possess entrepreneurial skills (McGowan et al., 2015). Thus, there is a need for an education system that encourages the development of business skills from the outset of education, to encourage the development of aspiring females from all educational backgrounds (Jones, 2014).

2.3.3 Behavioural Barriers

Aspiring females are likely to have lower levels of self-efficacy. They are often dismissive of entrepreneurship as a viable career choice and will choose a different career path if they believe they have a stronger skillset elsewhere (Wilson et al., 2007). This causes them to develop a risk aversion and are less likely to take risky entrepreneurial decisions. However, it has recently been suggested that the risk-taking propensity of women actually exceeds that of men, as by knowing the barriers they may face but still engaging with entrepreneurship, this exhibits a higher willingness to take risks than male counterparts (Castillo et al., 2017).

Furthermore, current coaching models are homogenous and fail to differentiate between gender. Many suggest that an impartial online coaching model would increase entrepreneurial self-efficacy by removing geographical barriers and offering increased flexibility (Hunt et al., 2019).

3 Research Methodology and Sample

This research adopts a case study research strategy (Yin, 2009) and qualitative approach (Saunders et al., 2015) as it attempts to gain a deep understanding of the whys and hows of a phenomenon in that particular context (TA programme).

Two of the authors of this chapter work in the programme as team coaches and had access to most of the students and graduates. A semi-structured questionnaire was distributed to all of the 60 female students and graduates of the programme, resulting in completion by 20 participants in total (33% of the total of females enrolled in the programme since it was launched in 2013–2014). It included both open (i.e. “what are your entrepreneurial motivations linked to the ‘need for independence and autonomy’?” The individual creates their company in order to be free from all external constraints, to be independent and to have full control of their life at work. The individual is at the origin of his own actions) and closed questions (i.e. *if self-employed, how did you start in the business?* (1) Entrepreneur by creation: I

Table 1 Respondents' start date (academic year)

	%
2013–2014	5
2014–2015	0
2015–2016	10
2016–2017	5
2017–2018	10
2018–2019	15
2019–2020	15
2020–2021	25
2021–2022	15
Total	100

Table 2 Respondents' age

	%
20 and under	25
21–24	50
25–29	20
30 and above	5
Total	100

started a business from scratch. (2) Entrepreneur by acquisition: I started by buying an existing business. (3) Entrepreneur by inheritance: I continued a family business. (4) Franchise: I helped expand the franchisers' business. (5) Other).

Fifty-five per cent of the responses we obtained were from current students who started after 2019 (see Table 1). Only 5% of the respondents had postgraduate or master's degree, which means that most of the graduates did not continue education after graduation.

Most of the respondents (75%) were under 25 (see Table 2). The managerial experience is low as 55% have no experience and 45% have 1–5 years of experience.

Twenty-five per cent of the respondents were studying either full- or part-time. Thirty per cent were solely working full time as paid employees and 10% as self-employed. However, there is another 15% that although they are self-employed, they are also either studying or working as paid employees or both.

All the self-employed participants consider they are entrepreneurs by creation and not by acquisition/inheritance or through a franchise. The majority (80%) has been running their business for 1 to 5 years. In terms of employees, 40% have no employees and 60% have 1–4 employees in their business.

In terms of the sector of activity, the number of participants that are working (paid or self-employed) in services is quite high, accounting for 54% of the total, followed by 15% in retail.

A thematic analysis was adopted as a framework to analyse the data. The main concepts that emerged were identified and categorised into common themes by different researchers. Statements and quotes allocated to the themes were then used to present a textual description of the qualitative empirical data. A descriptive analysis was used to analyse the answers that were of a more quantitative nature.

4 Findings

4.1 *Entrepreneurial Intentions*

To analyse levels of entrepreneurial intentions, the survey asked respondents to indicate levels of agreement with the following statements, using a seven-point Likert scale:

- I am ready to do anything to be an entrepreneur.
- My professional goal is to become an entrepreneur.
- I will make every effort to start and run my own firm/venture.
- I am determined to create a firm/venture in the future.
- I have very seriously thought of starting a firm/venture.
- I have the firm intention to start a firm/venture someday.

Overall, each of the statements elicited a higher percentage of responses in agreement than disagreement, suggesting strong levels of entrepreneurial intentions among respondents. The statements which elicited the strongest levels of agreement overall were "My professional goal is to become an entrepreneur" and "I am determined to create a firm/venture in the future".

The survey also explored whether entrepreneurial intention had changed during the student's time on the programme. The data highlighted that 80% of respondents had the desire to start their own business before joining the team entrepreneurship programme. This intention changed during the programme for 65% of respondents. For a relatively small proportion of respondents (15%), their intention has moved away from entrepreneurship, or this has become a longer-term ambition for the future with their shorter-term goals focused on gaining employment. However, a larger majority (40%) highlight that their entrepreneurial intentions have strengthened during the programme or their perception of entrepreneurship has shifted to a more obtainable and realistic goal through increased self-efficacy and through gaining relevant experience. This is encapsulated in the following quotes:

I always use to dream about having my own business but never thought about actually setting one up. I thought I would be better working for someone in a large company. However, after joining the TE program I realized that I'm more than capable of setting up my own business and have now realized that having my own business is all I want. (R5)

I would say the desire got stronger. It was more of a dream before I started TE but the programme helped me to see it as more of a reality and take the steps to make it happen. (R16)

It is interesting to note that both respondents use the word "dream", suggesting that entrepreneurship was previously viewed as unobtainable or unrealistic. This supports previous findings (Palmer et al., 2015) in relation to entrepreneurship education increasing levels of self-efficacy in females through providing knowledge and experience, and thus confidence, in the process of becoming an entrepreneur.

Figure 1 indicates the numerical data in relation to participants' attitudes towards entrepreneurship. A series of statements were derived based on the Theory of

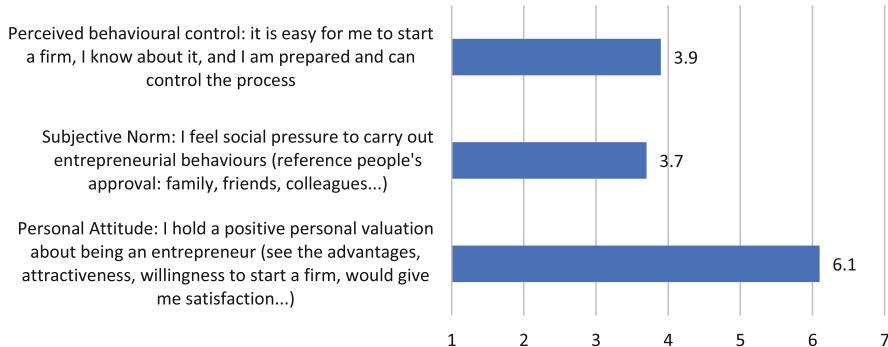


Fig. 1 Attitudes towards entrepreneurship (mean score values). *n*: 20

Planned Behaviour (TPB) model (Ajzen, 1991), and respondents were asked to rank each of the statements from 1 to 7, where 1 indicates total disagreement and 7 indicates total agreement.

A mean score of 6.1 indicates that the majority of respondents hold a positive personal valuation of being an entrepreneur, thus further suggesting strong levels of entrepreneurial intention among participants. This goes in line with studies that found a positive and significant influence of personal attitude and perceived behavioural control on entrepreneurial intention in females (Dinc & Budic, 2016). Respondents are, on average, more neutral in relation to the subjective norm, i.e. feeling social pressure to carry out entrepreneurial behaviours, and they have a higher disparity of opinions on this dimension. This supports previous findings (Palmer et al., 2015) where knowing an entrepreneur was a significant predictor of EI for males but not for females, perhaps owing to a lack of female entrepreneurial role models. Participants are also somewhat neutral overall in relation to the perceived behavioural control, suggesting that while participants may hold a positive attitude towards the benefits of becoming an entrepreneur, they are less confident in their abilities to do so. This is in line with previous studies highlighting lower levels of entrepreneurial self-efficacy in females (Wilson et al., 2009).

4.2 Entrepreneurial Motivations

Many respondents emphasised the practical element of the course as a driver to join the programme and how the methodology was seen as more appropriate for people with different learning styles. This reflects that the TA methodology could be much more inclusive as students are able to personalise their learning to surpass some of the barriers found in traditional academic settings under teacher-led approaches.

I liked the practical element. I would always lose attention if talked at for too long. I find even if I tried really hard in academics I still would never get the desired results but it was

Table 3 Female entrepreneur's motivations to start a business

	Mean value	1 Not at all important	2	3	4	5 Very important
To have greater <i>flexibility</i> for my personal and family life	4.65	0%	0%	5%	25%	70%
To have considerable <i>freedom</i> to adapt my own approach to work	4.60	0%	5%	0%	25%	70%
To earn a larger personal <i>income</i>	4.20	0%	0%	20%	40%	4%
To have a chance to build great <i>wealth</i> or a very high income	4.10	0%	5%	15%	45%	35%
To fulfil a personal <i>vision</i>	4.65	0%	0%	0%	3%	65%
To <i>challenge</i> myself	4.60	0%	0%	5%	30%	65%
To continue a family <i>tradition</i>	1.90	50%	25%	10%	15%	0%
To follow the example of a person I <i>admire</i>	2.45	20%	40%	20%	15%	5%

N = 20

more achievable with TE. I also always dreamed of owning a cafe so I thought entrepreneurship would be a good way of doing that. (R16)

I thought it would be a good opportunity to gain real life skills that I could take with me when hopefully starting my own business. (R18)

I joined the program because traditional degrees didn't suit my learning style. I get bored and distracted very easily but found this course to be the perfect fit as it was practical and pushed me out of my comfort zone. (R5)

I wanted more control over my future, I loved working with people, leading and learning about business. Entrepreneurship brought my love for these together and offered the freedom for me to make it my own. (R14)

Many mentioned within their main three reasons the networking and team element of it. This goes in line with studies that argue that social capital is emphasised for women, who may disproportionately require it in order to become entrepreneurs (Humbert & Drew, 2010).

I can work with others and lead in a safe environment. (R14)

To work closely with a range of different people and make friends for life. (R6)

The motivations that the participants have to start a business were measured with a scale of importance level from not important at all (Ajzen, 1991) to very important (BarNir et al., 2011) (see Table 3).

The motivation was mainly related to having freedom and flexibility, having to challenge themselves and desiring to fulfil a personal vision. The least important factors were to continue a family tradition or to follow the example of a person they admire. Wealth and income related motivations were of moderate importance.

Although the results are in line with other results in terms of the factors that are the most important among that list (Hart et al., 2017), if we compare the data with the results of that UK level GEM report, the percentage of female entrepreneurs stating

Table 4 Main intrinsic and extrinsic motivations

Main intrinsic motivations	Main extrinsic motivation
Achievement	Fulfilment
Accomplishment	Challenge and problem-solving
Helping others	Autonomy
Proud	Discovery and creation
Learn new things	Sustainability and community
Responsibility	Ability to leave a legacy
Enjoyment	Freedom and self-control
Satisfaction	
	Money
	Positive feedback from others
	Recognition of success
	Fear of not doing what others expect
	Fear of disappointment
	Fear of failure
	Making a positive impact in other's lives
	Academic performance (achieving a 1st)

the motivation was fairly or very important varies. In our context (HE) “to follow the example of a person I admire” was rated much lower (20% vs 38.5%), while others were stronger motivations for our young female team entrepreneurs, such as “fulfilling a personal vision” (100% vs 84.2%), “challenge” (95% vs 83.5%), “income” (80% vs 69.2%) and “building wealth” (80% vs 69.6%).

When talking about intrinsic motivations (Table 4), the participants talk a lot about autonomy, freedom and achievement or being satisfied and enjoying what they do. Although money is one of the extrinsic motivations that was more frequently repeated among the responses obtained, there were other factors that represent how the female entrepreneurs need to find “external validation” to what they do.

Participants referred to the need for independence and autonomy as an important motivator for them which they linked to running a team, having the freedom to learn and create or being in control of the decision-making process.

I am motivated by my own creativity and to not have limited boundaries when it comes to creativity. I want to work for myself and not feel limited in my ability to achieve more than what my manager/employer would want me to achieve. I look forward to running my own business when I work freely and independently, working with my own timetable. (R5)

I love having freedom in what I want to learn and develop. (R19)

Not having to answer to anyone or follow another leaders' rules or regulations. If I had my own business I would create them myself. (R12)

It's about having more control. As an entrepreneur you can have a meaningful say in what happens and how things are run, it enables you to create your reality. (R16)

The idea of a money-free lifestyle, whereby I can live a lifestyle and not have to consider cost, is really appealing. Coming from a working-class background, I have always wanted to succeed within a career to the point that I don't have to think about what I am spending. In addition, I have always been very driven to make this life for myself rather than be given such lifestyle. (R3)

In terms of the motivations related to the safety and well-being of the family, this was less relevant in our context as not many female entrepreneur students had family responsibilities. However, the participants acknowledged being able to contribute to the well-being of their families as an important aspiration. They look at it from the perspective of having more time for family but also from a financial point of view:

Being able to take care of my family is a motivator to be successful. (R14)

I want to be able to see my family when I need/would like to. I would like to be able to socialize with friends and family without feeling unable to due to work commitments. I want to be able to support them where I can. I feel mentally happy when I am working on my own projects/goals and aspirations compared to those that have been set for me. Therefore, being an entrepreneur will make me more physically happy compared to an everyday job. (R5)

Success often results in money. I have always to give back to those that have put so much time and effort into helping me build my entrepreneurial career within these early days and succeeding within my career is a way of doing that. Similarly, coming from a working-class background I didn't go hungry but, money was often tight when I was little. Personally, being able to ensure my children have the financial security they need to build their desired futures is really important and another reason behind why I want every venture I build to succeed. (R3)

5 Barriers Towards Entrepreneurship

When creating our survey, the aim was to examine the different types of barriers as established through prior literature. We asked participants to rank a number of barriers from 1 (to an extremely small extent) to 7 (to an extremely large extent). By doing this, we could analyse which of the barriers most female TAs perceive to be the strongest. We also compared perceived barriers before engaging in entrepreneurship, while doing so, in order to see if these barriers change (see Fig. 2).

The respondents identified a low level of legal and economic knowledge, lack of self-confidence, fear of failure, lack of work-life balance, lack of self-efficacy or limited access to finance as some of the main barriers.

It is interesting to note that most of those barriers are perceived as less of a limitation once the business is already running but that some of them increase: lack of self-confidence, lack of mentoring, lack of ambition for success, their personal attitude towards risk-taking, cultural barriers or fear of failure. Looking at standard variation values, there is a much higher disparity of opinions when evaluating the barriers during operations than when evaluating the barriers before setting up a business.

It seems that our participants perceive more behavioural barriers than infrastructural or societal barriers, so factors such as self-confidence, ambition for success, fear of failure or attitude towards risk-taking are more problematic for them (Table 5).

5.1 Societal Barriers

In terms of societal barriers, the results were divided. Very few of our participants found "gender stereotyping" to be a large barrier, with 50% rating this as a small barrier. We found the same result when looking at "male domination" and "discrimination" in the entrepreneurial sector. This implies that the notion of gender-based

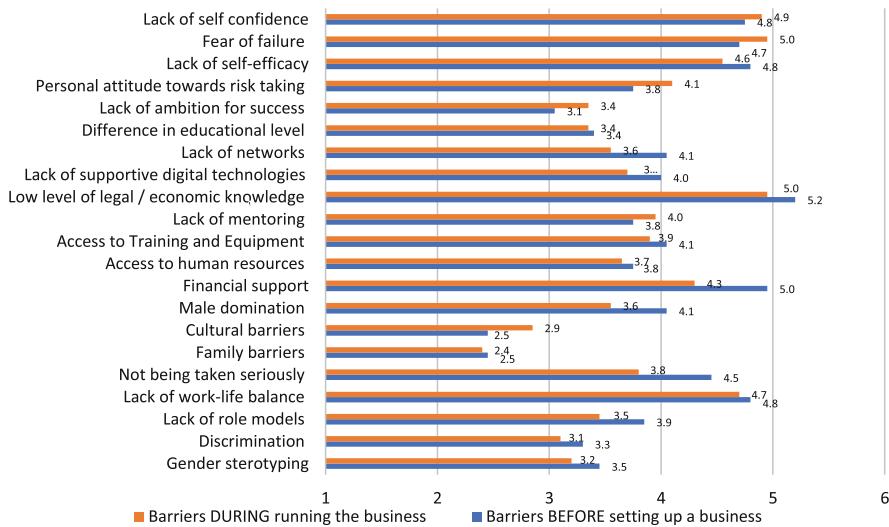


Fig. 2 Barriers towards entrepreneurship before and during setting up a business

Table 5 Categories of barriers and limitations (before and during business operations)

	Average	Societal	Infrastructural	Behavioural
Before	4.0	3.6	4.1	4.2
During	3.9	3.4	3.9	4.4

stereotypes acting as a barrier to female intentions of engaging with entrepreneurship is beginning to become outdated as we move towards a more gender-fluid society.

One barrier our participants did find to be large was a “lack of work-life balance”. Despite the rise in more gender-neutral concepts, the gendered division of labour is still unequal, and 75% of our participants found this to at least be a “moderate” barrier to success. There is a common notion that females are “not taken seriously as entrepreneurs”. This is the case for working mothers and people perceiving they have been patronised, which implies there is a need for coherent educational networks that target/adapt to working mothers, for instance.

5.2 *Infrastructural Barriers*

Limited access to financial support was found by our participants to be one of the main barriers to entrepreneurship, although this lessened once they started running their own business. This suggests that increasing economic intelligence through a TA programme is key to lessening assumed financial constraints.

Our participants, all of whom are degree educated, did not perceive a difference in educational level as a significant barrier, with over 50% of participants rating this

barrier as a small extent. This correlates with the suggestion that the further women progress through the system, the more likely they are to possess entrepreneurial skills.

5.3 Behavioural Barriers

Low self-efficacy is highly cited in literature as one of the main barriers females face. Conversely, our results on this were mixed, with a 50/50 split between participants. Research undertaken within the same TA programme suggests that personal growth and confidence building are the key values that the programme reinforces (Davies et al., 2022), but there is a constant dilemma on how to offer the right balance between the team and individual dimensions or the business vs. competency outcomes (Urzelai & Davies, 2022). However, lack of self-confidence was found to be a large barrier. This may suggest that low entrepreneurial self-efficacy is translating in this form and that female entrepreneurs believe that they can succeed as entrepreneurs but lack the confidence to do so.

This lack of self-efficacy can also take the form of risk aversion. Where a behaviour is seen as entrepreneurially risky, females are less likely to engage in this behaviour than their male counterparts, which is also reflected in our results. This is not to suggest that women lack "ambition for success", as when asked this the response from our participants overwhelmingly pointed towards this being a small barrier. It does however suggest that they have a lower risk-taking propensity and are less likely to make risky decisions that may, ultimately, benefit their business.

6 Conclusion

Despite the evidence of an escalation in entrepreneurial activity by women, females are still only half as likely as men to start a business, and education has a big role to play here. Inclusivity needs to be represented not only in the participants in the rooms but also in the teaching materials and resources, coaches and mentors or workshops and speakers. It is essential for an economy to welcome female entrepreneurs to start their own businesses, thus to create jobs, innovate and generate income.

Understanding the motives, intentions and barriers that our female entrepreneurs face in the context of an innovative entrepreneurial programme within HE is important to evaluate whether what we offer as educators supports their needs and aspirations. Societal barriers enshrined through centuries of patriarchal society have led to infrastructural barriers that act as an administrative hurdle. However, education can play a very important role in minimising the female entrepreneurs' cognitive barriers that influence their behaviour.

The research findings show that the educational setting provides the supportive environment for them to gain confidence and the female entrepreneurial students gain self-efficacy through the experience of running their projects throughout their programme. They value the community and experiential learning approach and the freedom they get to personalise their learning and build their social capital. Throughout the degree they actually start believing that it is possible for them to start a business and they are capable of doing it.

Even if they are surrounded by males in the programme (only 15% are females) and some have not started their own business yet, their entrepreneurial intentions remain strong or increased during their time at university, and they have a positive attitude towards the benefits of becoming entrepreneurs, but they lack the confidence to take actions and risks, and they need their teams, coaches and surrounding to reinforce their achievements and past successes and provide constant feedback that minimises their own self-doubting feelings.

Besides, the programme might need to evaluate how the message is received externally as entrepreneurship has connotations that might stop females from taking that career route. The message could focus not just on “venture creation” or “business outcomes” but on providing the support system for females to develop entrepreneurial and enterprising skills and competencies that make them flourish into more independent and confident living and thinking individuals. However, this poses a debate to the programme team as both the data from females (10% are self-employed as their main source of income) and data from graduates (15%) show that the programme might support the students in their personal development ambitions regardless if those are venture creation related or not. Is this programme for entrepreneurial individuals that want to set up businesses and lead their own organisations? Or is it for enterprising individuals that develop self-confidence, curiosity and problem-solving skills and might want to work for other organisations? Hopefully the second will lead into the first, and enterprising skills will encourage entrepreneurial action and job creation.

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The Experiential Perceptions of Entrepreneurial Competencies: Avenues for the Next-Generation Entrepreneurship Education



Juha Kansikas and Pavlos Tarasanski

Abstract This self-narrative study on entrepreneurial competencies was conducted among potential next-generation members belonging to entrepreneurial families. As public university bachelor students, self-narratives written by the students themselves do not reflect just perceptions of entrepreneurial competencies in the context of business families but also in the context of higher education. The conceptual advancement of this paper focuses on extending the discussion of entrepreneurial experience-based competencies before designing and launching a venture, such as creativity, innovativeness, risk-taking, sales, and marketing.

Keywords Entrepreneurship education · Entrepreneurial competency · Next generation · Family business · Higher education

1 Introduction

The aim of the study is to understand entrepreneurial competencies by the higher education students belonging to entrepreneurial families. Entrepreneurial competencies will be understood empirically based on the undergraduate student self-narratives and their qualitative analysis. Theoretically, this study focuses on entrepreneurship education from the perspective of entrepreneurial competencies, in the context of potential next-generation members preparing for the future business world. These undergraduate students contain cognitive, conative, and affective assets of entrepreneurship which are based on summer jobs, family role models, heritage, culture, and other types of forms of socializing yourself to business through your family members. Thus, studying experiential perceptions among them enables us to increase conceptual understanding on next-generation entrepreneurial competencies.

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By reasoning and interpreting self-narratives, we conceptualize next-generation entrepreneurial competencies and increase knowledge related to them. This has both educational implications and managerial implications in forms of teaching and consulting family businesses and entrepreneurial families. In addition to these pragmatic approaches, this paper contributes by suggesting research initiatives on future next-generation entrepreneurship studies. These implications will be debated more in detail at the Conclusions section.

Methodologically, the study is based on self-narratives written by potential next-generation members with an entrepreneurial family background. Self-narrative analysis based on categories of analysis and their content was conducted. Self-narratives enable personal expressions, reflections of memories, and documentation of experiences. As self-narratives focus on understanding self-identity and its construction, in the form of "I" and "me," the role of the researchers is to understand as "we" and "us" the self-narratives. These roles characterize self-narrative analysis and offer multiple possibilities to conduct the qualitative reasoning. We chose for this purpose lexical search terms and aimed to understand the self-narratives as accounts of realities in which the meanings of the concepts vary. Through multiple searches and analysis, we formed coded segments which reflect main contents of the documents. At the Results section, the categories of analysis at the self-narrative analysis will be presented to understand conceptual realities of students belonging to the potential next-generation entrepreneur generation. Later at the Discussion section, preconceptual understanding will be reflected with the conceptual interpretations to increase contribution to generalization of the concepts related to the research question stated.

As European bachelor students at the public university, these young people do not just represent potential next-generation members. They reflect new suggestions and ideas on how to modernize entrepreneurship education in higher education and what type of future expectations potential next-generation members have through the experiential learning experiences they have about entrepreneurship.

Potential next-generation entrepreneurs experience entrepreneurship from early childhood (Bozer et al., 2017). They gather influence through belonging to entrepreneurial families, which impacts the intention to start their own business in comparison to those persons who do not have any entrepreneurial family background. This is explained by effects of the resource accesses (Vladasel et al., 2021) which increases the likelihood of becoming an entrepreneur in comparison to students without experiential knowledge. As next-generation members contain long-term experiential knowledge on entrepreneurialism (Murphy et al., 2019), it is relevant to understand their perceptions of entrepreneurial competencies in entrepreneurship education. We notice the current criticism in entrepreneurship literature toward the question "who is an entrepreneur?," and for this reason, we aim to understand students, who because of the circumstances of belonging to entrepreneurial families are more likely to become entrepreneurs (Ramoglou et al., 2020).

The potential next-generation entrepreneurs gather influences from multiple stakeholders, including not just school, social media, friends, and role models but also from their family members as family influence, i.e., familiness (Frank et al.,

2016). Belonging to an entrepreneurial family makes the potential next-generation entrepreneurs choose some of the social and ethical models (Bernhard & Labaki, 2021) and working practices their family members represent, like managing innovations (Erdogan et al., 2020). Lack of next-generation commitment and engagement to business creates risks for family business continuity (Garcia et al., 2019). Studying the family influence on the next-generation entrepreneurial competencies would need a quantitative research setting, and for this reason, it is not studied in this paper. Instead of that, next-generation entrepreneurial competencies are understood through student self-narratives with the methodological aim to interpret them through analysis of categories.

Current research has identified needs to study different contexts of entrepreneurial competencies and how higher education can answer for these challenges (Gümüşay & Bohné, 2018) and how entrepreneurship education can influence entrepreneurial competencies and therefore entrepreneurial intentions (González-López et al., 2021). For this reason, we aim to study potential next-generation members of the entrepreneurial families and their perceptions of entrepreneurial competencies in higher education. Thus, the research question of the study is: "How do potential next-generation members perceive entrepreneurial competencies in higher education?"

2 Literature Review

One of the key questions surrounding entrepreneurship that links back to the search for the distinctive nature of entrepreneurs is whether we can teach it or at least nurture various competencies within students (Bird, 2019). Despite the arguable popularity of entrepreneurship nowadays, so far entrepreneurship education has not managed to deliver promising results (Nabi et al., 2017). Entrepreneurship education has attracted criticism from various directions, such as a focus on outdated pedagogies (Bae et al., 2014), mismatch between coursebook contents and actual experiences of entrepreneurs (Edelman et al., 2008), and a lack of qualified personnel to deliver entrepreneurship courses (Gümüşay & Bohné, 2018). This may be partially the reason why interest in entrepreneurship is high but, on the other hand, the belief in one's ability to become an entrepreneur is somewhat low (Pavone, 2018). That is a problem which can be addressed by focusing on the development of the required competencies, as demonstrated in this chapter. However, to successfully do that, we must ensure that the ones helping students become entrepreneurs are also suitable for the job.

Discussions surrounding who should be the one teaching about entrepreneurship have been going on, yet no consensus has been achieved as suggestions on co-learning environments with students and teachers, (Collins et al., 2006), experiential learning in business (Cope, 2005), student-led experiential learning (Bell & Bell, 2020), and learning in entrepreneurial ecosystems with other entrepreneurs (Guiso et al., 2021) have been made. Whereas often students consider that the one to teach should be the one who has done it, teachers counterargue that it is enough for a

pedagogue to exert entrepreneurial qualities and be able to positively affect the entrepreneurial intentions of the students (San-Martin et al., 2021).

The discussion surrounding entrepreneurial competencies can be linked to attempts to decode entrepreneurs in terms of what makes them distinct from non-entrepreneurs (Gartner, 1989). The nature of the discipline is dynamic and in close interplay with the personal experiences, feelings, and thoughts of the individuals engaging in it, which sometimes makes it a challenge to find common ground among them. Nonetheless, it is assumed that finding such commonalities can provide a compass that might be able to guide educators toward nurturing key competencies via educational means (Schindelhutte et al., 2006), if we are to believe that such competencies can be taught in the first place. The motivation to do so is justified within entrepreneurship education literature with evidence postulating that should a person gain a better understanding and mastery of the competencies relevant to entrepreneurship, the intention to start up a business will be greater (Sánchez, 2013).

Entrepreneurial competencies differ from the possession of specific skills in a manner that they include behaviors, knowledge, personality traits, and experiences among others (Bird, 2019). In other words, they answer the question of what enables an entrepreneur to engage in the activity from a holistic point of view rather than focusing on a particular skill. Entrepreneurial competencies have been studied from multiple contexts, such as motives (Cruz-Ros et al., 2017), intentions (Sánchez, 2013), learning (Kennedy et al., 2021), and entrepreneurs themselves (Mitchelmore & Rowley, 2013). For example, sustainable entrepreneurs need their own type of entrepreneurial competencies related to ethical and business-based decision-making and ecological and social value creation (Carey et al., 2021).

Not only entrepreneurial competencies have been studied with regard to different impacts on various elements of entrepreneurship, but they also have been approached from the perspective of which ones are more crucial depending on the stage of the company. At the inception phase, creativity and innovativeness, flexible and agile thinking, and market knowledge are prioritized among the potential entrepreneurs as entrepreneurial competencies (Oosterbeek et al., 2010).

In turn, as a company progresses through the inception phase and begins a full cycle of activities, a different set is becoming more important, specifically market knowledge, relationships, decision-making, resource management and leadership, strategic management, and commitment (Man et al., 2002) (see also the work by Rasmussen (Rasmussen et al., 2011) on opportunity seizing and entrepreneurial competencies).

Entrepreneurship education vary depending on the aspects of conative, cognitive, and affective components (Johannesson, 2018) selected for teaching and learning (Johannesson, 2014). As affective component is rooted into emotions, conative one reflects motivation and cognitive one knowledge. (Kyrö et al., 2008). Entrepreneurial competencies can be related alternatively, or simultaneously, to conative, cognitive, or conative pedagogies, didactics, and learning agendas. This study will focus on cognitive approach based on the abduction between self-narrative analysis and conceptual understanding.

3 Methodological Choices of the Self-Narrative Study

Methodologically, this study aims to analyze empirical material through qualitative self-narratives of public university students. Thus, 514 bachelor-level university students participated in writing self-narratives in March 2021, meaning 4–10 pages (written as a word document or a pdf) of text per student. The task was done as a home exercise at the course Introduction to Entrepreneurship at the Jyväskylä University School of Business and Economics in Finland. The self-narratives were written with students' mother language, in Finnish, and they were returned personally by downloading the narrative into the e-learning environment.

The study is based on a type of qualitative entrepreneurship research, narrative analysis, which is based on self-reported narratives in which categories of analysis and profiles within them are recognized (Van Burg et al., 2020). Narrative research fits into next-generation context, as it enables students to study multiple topics related to family business strategy and management, including continuity and future of entrepreneurial firms (Hamilton et al., 2017).

Out of the 514 persons, 171 persons belonged or had belonged earlier to entrepreneurial families. Out of the 514 persons, 4 persons declined to give permission to analyze the self-narrative report, and for this reason, they were excluded from the data. The empirical material of 171 next-generation students contained 850 pages (200,000 words) of self-narrative texts. First, entrepreneurial family members were identified from the material based on students' self-reporting. This was done through the self-narratives about their earlier experiences on entrepreneurship and possible experiences in an entrepreneurial family. Thus, we utilized among the students an experiential selection criterion on next generation to identify them (Bell & Bell, 2020).

The criterion was that at least one of these options will be fulfilled so that a student could be regarded as a potential next-generation entrepreneur:

- (a) Mum or/and dad had been or is currently an entrepreneur or an owner-manager.
- (b) Sister or brother had been or is currently an entrepreneur or an owner-manager.
- (c) In the case of other relatives (grandparents, cousins, aunt, uncle), we analyzed carefully the content and decided if there were personal experiences in entrepreneurship. In the case of seven students, this criterion was fulfilled.

As "meaningful experientially," we meant that the student wrote a self-narrative about closeness and personal experiences related to entrepreneurship so that it had an impact on understanding what entrepreneurship is in practice. This included, based on (Garcia et al., 2019) study on the next-generation commitment to family business, factors such as role modeling, encouragement, and emotional support, but also personal experiences like summer jobs, observation, and communication with family members. This study does not divide students into different types of next-generation profiles but instead sees the bachelor degree students as potential next-generation members based on the experiential selection criteria they all possess.

Second, the self-narratives were analyzed by the MAXQDA2020 software. The aim of the software is to categorize the 850 pages of text into concepts that reflect entrepreneurial competencies through saturation. Finally, the author(s) did the iteration and the interpretation with the data when writing the qualitative results based on the self-narrative analysis. Results will contribute to understanding higher education from the perspective of students who are members of entrepreneurial families.

Methodological rigor of the study is based on using simultaneously the MAXQDA program and the self-narrative analysis approach. The role of the MAXQDA program is to create a text pool of qualitative self-narratives, to conduct transcription of the documents, and to organize them. At this resource pool, all the self-narratives were saved as documents. Among these documents, lexical search terms, decided by the author(s), were chosen for the research. This was done by reading through the self-narratives and selecting search terms to interpret the research question and preconceptual understanding related to it. The MAXQDA 2020 program was used for making the search and to create coded segments for the self-narrative analysis. The role of the lexical search terms and the coded segments was to create saturation related to the pool of self-narratives and the research question stated.

Rigor of the analysis was based on making multiple lexical searches and testing different search terms in lexical searches and by reading manually the self-narratives and engagement on creating a self-narrative template for the students. Also, author(s) were supervising students whenever needed in their writing process.

The coded segments were manually analyzed by the author(s), who interpreted the research question through creating categories of analysis. The role of the categories of self-narrative analysis was to understand conceptually entrepreneurial competencies by the potential next-generation entrepreneurs.

4 Results

Qualitative self-narrative analysis was chosen, to understand categories of analysis within them conceptually. By self-narrative analysis, we mean self-identification of students to entrepreneurship (Phillips, 2012). As students self-report their experiential world, they also reflect entrepreneurial competencies through the emotions, experiences, thoughts, and future ideas they have got about entrepreneurship.

Self-narratives reflect not just present and future assumptions on entrepreneurship but also distant and close, but still memorable, experiences of it. Some of the students identify “the entrepreneurial self” (Frederiksen & Berglund, 2020) as the others are still in the process of thinking what their identity is as young bachelor students. This identity of the next generation, as a contextual focus of the research, is characterized in this study through family background and experiences in it, often reflecting action-based learning together with communication, observation, participation, and personal thinking (Gregori et al., 2021).

The following lexical search terms covered multiple documents by creating large segments of the self-narratives, enabling saturation in qualitative analysis (search terms are translated from Finnish to English): 1) competencies and know-how (772 coded segments, from 276 documents), 2) risk-taking (218 coded segments, from 109 documents), 3) creativity and innovativeness (347 coded segments from 168 documents), and 4) sales and marketing (615 coded segments from 256 documents). The codes represented all words starting with the same letters, adjectives, and verbs, meaning that in the case of term number 3, creativity and innovativeness, also terms which started with “crea” and “inno” such as “to create,” “to innovate,” “creative,” and “innovative,” were included into the coded segments. As the same term can be multiple times in the same document, the number of documents is higher than the original 171 self-narratives. In sum, these four main categories contained 1952 coded segments at the self-narratives written by the students.

In terms of lexical search terms, the following concepts were tested with the MAXQDA2020 program and excluded from the analysis (number relates to coded segments, the search terms are translated from Finnish to English): resilience (0), network (36), networking (3), skill (191), skillfulness (23), internship (16), capability (2), to practice (152), be able to (92), to learn (353), teacher (145), and learning (158).

The number of the excluded coded segments was 1171. Exclusion criteria were based on analyzing how the content overlaps between the coded segments and contribution of the focus of the research. Most of the largest excluded segments, such as to learn, learning, to practice, and ability, did not increase contribution on the focus of the research. Saturation was able to be achieved through the four groups of coded segments to understand next-generation entrepreneurial competencies.

The first group of categories of analysis was generic, and it was related to how students understood what competencies, know-how, and abilities are in entrepreneurship. Representative direct quotations (translated from Finnish to English) are presented at each category of the analysis (CA). Understanding competencies was based on three categories of analysis. First, competencies were understood as sources of opportunities (*CA1 Professional competencies as sources of entrepreneurial opportunities*). Interest toward academic and complex expertise enables an increase in professional competencies which offer sources for entrepreneurial opportunities: “There is a possibility to create something of your own, and to adopt current technologies or to start to consult complex solutions related to the information technology. I have been lately very interested in cloud services and information technology solutions in organizations. This is a topic which could make me start a business and to become an entrepreneur. In practice it could focus on consulting organizations.”

The second category of analysis (*CA2 Competencies needed in starting up a new business*) was related to competencies students regard as an essential pool of knowledge in the process of becoming an entrepreneur and in starting a new business. These competencies were based on a vision and on dreaming to become an entrepreneur: “As an entrepreneur you are free to influence yourself for your job and on how you employ yourself. Entrepreneurship is based on competencies to take

advantage of your know-how. You have to trust for yourself, and for the start-up and its profitability... Entrepreneur needs to have multiple skills, as you need in running the business skills of marketing and accounting. You need to have prior working experience and ability to develop your business and its services."

The third category of analysis (CA3 *Unknown world of competencies*) reflected the reality of bachelor degree students who in several cases were first year students (especially in the case of business school bachelor degree students who take this course in the first year). Personal competencies were still an unknown mystery in this category of analysis. Entrepreneurship was familiar in this group through family members, role models, media, and school, but the personal competencies and identity related to it were still unknown: "I am still so in the beginning with my studies that it is impossible to say what kind of expertise will I have in the future, and what my interests professionally."

These three generic categories of analysis focused on student understanding of competencies. More precisely, categories of analysis on risk-taking, creativity and innovativeness, and sales and marketing will focus more in detail on entrepreneurial competencies of potential next-generation students.

Risk-taking, as a coded segment, contained the following categories of analysis, based on the self-narrative analysis conducted: *risk-taking as a future-oriented competency* (CA4), *risk-taking as an experience-related competency* (CA5), *risk-taking as a courage-related competency* (CA6), and *risk-taking as a gateway to new business operations* (CA7). Risks were future-oriented in terms that they reflect "belief in the future..." and they were related to "...abilities to see new business opportunities proactively" (CA4). Risk-taking was also understood as an experience-related category, in which past, present, and future-expected experiences influence students' view on entrepreneurial competencies: "I have learnt through experiences when to take risks and when to avoid risk taking" (CA5). In addition to that, missing experience was realized. Risk-taking was related to courage and highly personal among students: "I would not like to be an entrepreneur at the moment, because I feel that uncertainty and risks are too high, especially during this covid pandemic... it takes a lot of courage and risks are often too high (CA6). Despite the heterogeneity of risk taking as an entrepreneurial competency, "Entrepreneurship is about challenging and developing yourself, and to take risks.. Entrepreneurs are risk takers and they produce innovations..." (CA7).

Creativity and innovativeness reflect competencies to generate new improvements and solutions for markets by combining resources available. As categories of analysis, *creativity as a decision-making tool* (CA8), *creation of newness* (CA9), and *agile thinking* (CA10) were interpreted. Creativity enabled competencies on entrepreneurial decision-making (CA8): "As an entrepreneur, you can choose your own team" and "As an entrepreneur you can generate ideas by yourself and be creative." Also, creating new business and finding new improvements and solutions were evident (CA9): "As a person I am creative, and I want to constantly try something new." Not just decision-making and newness creation but also agile thinking was interpreted as an entrepreneurial competency (CA10): "You need to possess somehow proactive and innovative thinking, which makes you to identify

up-to-date, important trends, and to find out new things and in general, to make yourself visible and distinct as an entrepreneur and as a business.”

Sales and marketing represent a large mass of coded segments, focusing on marketing from multiple perspectives. As categories of analysis, the following ones were interpreted: *sales as a gateway to entrepreneurial behavior* (CA11), *salespersons as role models* (CA12), *marketing as a source of start-up feasibility* (CA13), and *market gap identification* (CA14).

Sales was a source of entrepreneurial behavior for the potential next-generation students (CA11): “I do not have any entrepreneurial experience, but I think that the sales experience I got has created my intrapreneurial potential”; “I have done some sales in promoting gigs, but I would be interested in developing the idea further.” In birth and growth of competencies, role models are meaningful for young next-generation students (CA12): “I have worked in sales, and I get along very well with different types of people and I believe this is very useful if I will one day start my own business... many of my relatives have worked as salespeople....” Marketing and sales are interconnected competencies in new business development and its feasibility (CA13): “It is, for sure, very useful to acquire knowledge on different types of business formats, marketing, customer relationship management, and sources of funding for a start-up.” Also, marketing provides opportunities to create competencies to understand market gaps (CA14): “Entrepreneurship is social action, in which entrepreneurs identify market gaps in which there are opportunities to do profitable business.”

5 Discussion

The research question of the study was: “How do potential next-generation members perceive entrepreneurial competencies in higher education?” Next, the research question will be answered by understanding conceptually the results by positioning it with the preconceptual knowledge of the current research literature.

Student perceptions of artificial entrepreneurship are reflected through competencies which are gateways to opportunity access, resources to start new businesses, and into the world of unknown realities. Thus, entrepreneurial competencies lead in the world of students to opportunity evaluation and start-ups, and for this reason, they are vital for those potential next-generation members who want to become entrepreneurs. It must be recognized that entrepreneurial competencies are not known, recognized, or realized by a group of students. In the case of the professional identity and the personal one, the transformation will take place in the future, and for this reason, competencies are still a vague concept of unknown and artificial realities which is in contradiction with thinking of next-generation members as a homogeneous group of experienced family business members (Murphy et al., 2019).

These early birth processes of entrepreneurial competencies among students combine experiential learning with school-based theoretical learning (Bozer et al., 2017). As potential next-generation members, these students have opportunities to

learn through action-based research, problem-based learning, and case study approach, both pragmatically and theoretically. Opportunities and risks are reflecting realistic resources, as next-generation students benefit from having better resource access in comparison to other students (Vladasel et al., 2021). All these approaches support learning entrepreneurship in practice, and they can contribute to student participation in classes and thesis with synergy between theoretical and business practice-oriented thinking.

The conceptual knowledge among the students refers to the status before the venture has been started. Risk-taking, as a concept related to the processes before the venture takes place (Oosterbeek et al., 2010), is seen from multiple conceptual worlds among the student perceptions of entrepreneurial competencies. Risk-taking, as a meta-conceptual approach, reflects the early processes of entrepreneurial competency formation. As a meta-conceptual understanding, it is interlinked as entrepreneurial behavior, with entrepreneurial competencies like creativity and innovativeness. As a distinct factor between entrepreneurs and other individuals (Gartner, 1989), entrepreneurial competencies by potential next-generation members are future-, courage-, and opportunity-related risk-taking factors which are personally experienced perceptions.

Creativity and innovativeness, as distinct entrepreneurial competencies, increase conceptual knowledge on agile thinking, decision-making, and creation of newness (Oosterbeek et al., 2010). From the perspective of potential next generation, entrepreneurial competencies related to creativity and innovativeness are on cognition and decision-making and on having an entrepreneurial mindset which enables also creating clever and innovative solutions for the market through multiple perspectives of newness.

The role of sales and marketing among the potential next generation can be interpreted through the first working experiences bachelor students have had recently. Often starting with sales as a summer job, many of the students had the impression that sales and marketing are sources of entrepreneurial behavior, and thus a starting point for entrepreneurial competency formation, needed in new business development. Market knowledge, as a distinct factor among potential next generation, was perceived as market gap identification.

We chose to understand in this study cognitive component of entrepreneurship education (31; 32; 33). This limits the conative and affective type of education and its contribution in this study. Namely, cognitive constructions at the categories of analysis were based on skills related to starting the business and recognizing opportunities. Knowledge on competencies, risk-taking, and creativity were part of the conceptual interpretation. Related to cognitive skills, agile logic was part of the student narrative saturation. Marketing and sales skills were also conceptual perceptions of what entrepreneurial competencies are.

6 Conclusions

Potential next-generation entrepreneurs perceive entrepreneurial competencies from the perspectives of being competent in marketing, sales, risk-taking, creativity, innovativeness, and on understanding know-how and competencies in entrepreneurship through opportunity- and future-related dimensions they possess. The vision of competencies can be unclear and reflect in those cases unknown mysteries to students, which will be understood in the future as the career development will start. Experiential knowledge through the potential next-generation status enables students to perceive entrepreneurial competencies through their experiences. Potential next-generation members of entrepreneurial families need education tailored for them. First, they contain early experience-based knowledge on daily business operations in SMEs, which enables experiential learning through earlier communication, participation, observation, and traineeships. Second, potential next-generation entrepreneurs have resource access which enables opportunity recognition and possibly in the future seizing of entrepreneurial opportunities. Third, risk-taking related to entrepreneurship is well-known for them, which enables them to understand their own risk-taking behavior and causal relationships related to risk-and-return ratios.

The conceptual contribution of the study is twofold. First, next-generation entrepreneurial competencies at the context of cognitive entrepreneurship education are conceptually pragmatic and action oriented. This operative nature at the concept of cognitive entrepreneurial competencies by next generation reflects the student mindset and the contexts they live at. Cognitive entrepreneurial competencies are an entrepreneurial knowledge pool, which enables young next-generation members to start businesses and to make a career in business. Next-generation member entrepreneurial competencies reflect conceptually start-up and growth entrepreneurship and creation of new innovations and business solutions for the markets. Thus, next-generation cognitive entrepreneurial competencies reflect conceptually the world of uncertainty and unexpected future.

Second, with regard to entrepreneurial intentions, this study contributes on applied skills. Thus, entrepreneurial competencies by next generation can be acquired and trained as a pool of skills. Pedagogy selected to cognitive training differs from conative and affective contexts. Thus, entrepreneurship educators should focus when training cognitive skills on start-up management skills, growth entrepreneurship, and sales and marketing. The elements of uncertainty, unpredictability, and sudden changes could be included into entrepreneurship education.

The approach of experienced participants in higher education challenges entrepreneurship education stakeholders to build demanding and meaningful learning environments for the potential next-generation entrepreneurs. Entrepreneurship education in the case of experienced participants is typically experiential learning with active internships and career development. The role of academic teaching and higher

education in entrepreneurship education pedagogy needs to be tailored according to the needs of the potential next-generation students.

Limitations of the study are concerning generalization of the results. Qualitative research advances conceptual thinking by increasing the understanding of concepts themselves. Therefore, generalizing results based on self-narrative studies to some population does not take place. We have not compared the next-generation and the non-next-generation students statistically at this current research setting. Instead of that self-narrative analysis enables us to discuss more about entrepreneurial competencies in the context of potential next-generation entrepreneurs. A major limitation of the study is regarding to the quality of the self-narratives produced by bachelor students. The quality and length of self-narratives varied, and in some cases, to increase reliability of the research, short answers were excluded from the categories of analysis. As self-narratives were a compulsory part of the course assignments and the questions were meaningful for young student career development, motivation to participate in self-reporting was supported.

Further research should focus on reflecting how we understand concepts and their intermeanings and realities in multiple contexts they derive. Contextually, an important implication could be to compare next-generation and non-next-generation students together and understand the realities they have in regard to entrepreneurial competencies. Longitudinal study, in which, first as students and later as graduates employed in a family business as the next-generation members, could be needed to understand the evolution of entrepreneurial competencies in career development. More studies on family influence on next-generation entrepreneurship competencies could be studied at the context of family businesses to increase knowledge on the role of family businesses in next-generation entrepreneurial behavior.

Pedagogical implications do not stem from generalization of the results. Instead of that, a pedagogical approach must be chosen in qualitative research based on conceptual innovations. As each family business is unique in terms of social relationships and other resources, students need highly personal learning routes and study plans to recognize and to adopt entrepreneurial competencies needed.

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Part III

**Design, Didactical Approaches,
and Pedagogy of Entrepreneurship
Education**

Design Thinking Within Entrepreneurship Education: Different Perspectives and Common Themes in the Literature



Hannah Laura Schneider, Louisa Huxtable-Thomas, Paul Jones,
Robert Bowen, and Nils Högsdal

Abstract Design thinking (DT) has been claimed to hold promise for bringing education into the twenty-first century. Many entrepreneurship educators are increasingly integrating DT into their entrepreneurship curricula. Thus, there has been a growing interest among entrepreneurial educators to understand the value and the conceptual interface of DT within entrepreneurship education (EE). The purpose of this chapter, therefore, is to illustrate the interface of DT within EE and its current discussion within the literature. This explorative literature review follows an interpretive approach to discuss general theoretical parallels and common core principles of DT in EE at different levels. The findings of this literature review contribute to a more profound perspective on the conceptual clarity of DT in EE.

Keywords Entrepreneurship education · Design thinking · Literature review · Entrepreneurial education

1 Introduction

Entrepreneurship education (EE) is considered to be one of the pioneering fields in the implementation of design thinking (DT) (Sarooghi et al., 2019). Over the last years, DT has emerged in a variety of educational contexts of entrepreneurship, including in the context of the EntreComp framework (Bacigalupo et al., 2020; Campbell, 2019). Recent developments have influenced the increasing use of DT in

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EE curricula, as Bacigalupo et al. (2020) describe DT as one of the three most important entrepreneurial methods. Recent research has demonstrated the wide application of DT in entrepreneurial contexts (Klenner et al., 2021) as well as among entrepreneurship educators (Kremel & Wetter Edman, 2019) and confirmed that DT is integrated into more than half of the entrepreneurship curricula (54%) (Sarooghi et al., 2019).

Despite the wide popularity and application that design thinking has gained in EE practice (Neck & Greene, 2011), the interface of DT within EE has not been discussed sufficiently in academia (Huber & Sailer, 2016; von Kortzfleisch et al., 2013) and DT has been overlooked by EE research. Moreover, especially, entrepreneurship educators have been characterised as lacking criticality (Fayolle & Gailly, 2008; Fayolle & Gailly, 2015) and jumping into new methods for teaching without questioning (Blenker et al., 2019). Thus, there appears to be currently no consensus on the level at which the interface of DT/EE occurs. While some present DT as an entrepreneurial method that can be used as a toolbox for entrepreneurship educators, others argue for using DT to design entrepreneurship education (EE) in general (Huq & Gilbert, 2017; Nielsen & Stovang, 2015). Design-based curricula and DT are one way to address the growing need for contemporary higher education. Indeed, future generations need to be equipped with DT skills to face uncertainties and address problems with a creative lens (Goldsby et al., 2017; Sarooghi et al., 2019). Therefore, there is a clear need for increased clarity across the range of entrepreneurial methods in order to improve existing EE practices (Mansoori & Lackéus, 2020). Crucially, the application of DT in EE is under-researched, and the underlying interface has not been constructed yet. Thus, the synthesis of common themes and unifying logic and the investigation of common theoretical groundings help stimulate theoretical sensitivity towards the concept of DT in the EE context.

The purpose of this chapter, therefore, is to illustrate the interface of DT within EE and its current discussion within the literature. This explorative literature review employs an interpretive approach to discuss the general theoretical parallels and common core principles of DT in EE at different levels. The review contributes to a more profound perspective contributing to the conceptual clarity of the DT/EE nexus. Its findings provide new insights into whether DT is just temporary or whether the integration of DT within EE is substantial. Finally, this chapter helps bring convergence to a common understanding of the value of DT for EE in order to inform future EE practices.

2 A Review of Design Thinking as It Pertains to Education

2.1 *Design Thinking Within the Academic Discussion*

Although the term “design thinking” did not exist yet, researchers have been investigating the designer’s thinking process for the past 50 years (Boland & Collopy, 2004; Henriksen & Richardson, 2017; Simon, 1996). Today, a myriad of

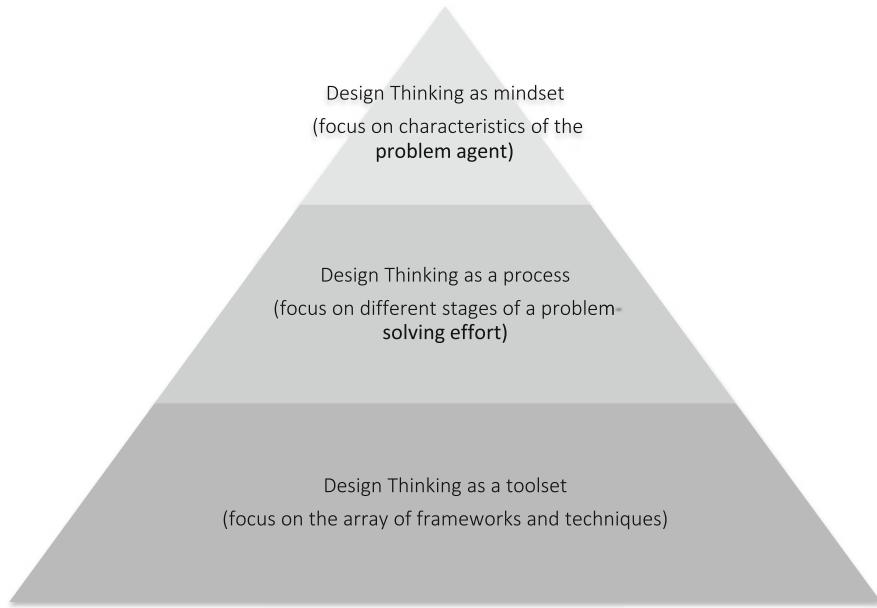


Fig. 1 Design thinking definitions structured in three categories derived from Brenner et al. (2016; Sarooghi et al., 2019)

definitions of the term “design thinking” proliferate in academic and practitioner-oriented literature and demonstrate the different perspectives taken on DT. Recent contributions have been made to explore and structure DT discourses. As an example, Johansson-Sköldberg et al. (2013) differentiate between three different perspectives: DT as a way of working with innovation (Brown, 2008), DT as a necessary skill that managers should adapt to solve organisational problems (Huq & Gilbert, 2017) and DT as part of the management theory (Boland & Collopy, 2004). In the same vein, Hassi and Laakso (2011) describe that DT within the managerial realm consists of three elements: a set of practices, a cognitive approach and a mindset. From a managerial perspective, Dell’Era et al. (2020) have recently identified four different interpretations of the DT paradigm characterised by different practices: creative problem-solving, sprint execution, creative confidence and innovation of meaning. Within the EE context, Sarooghi et al. in 2019 (Sarooghi et al., 2019) categorised the different definitions of DT into three different categories based on Brenner et al. (2016): mindset, process and tools (see Fig. 1). This logic of a pedagogical pyramid reflects the different stages of DT within EE (Huber & Sailer, 2016).

Figure 1 demonstrates the significant diversity in the definitions of DT. This diversity reflects the richness of the concept and the different perspectives on it. Within this paper, Sarooghi et al.’s (2019) classification of DT is further applied. Although DT is a fragmented term with very different complex definitions, common themes emerge. In particular, DT has been conceptualised through themes such as

wicked problems/problem-solving, empathy and human-centredness, tangibility and prototyping and interdisciplinary and multidisciplinary teams.

The first theme characterising DT is “wicked problems/problem-solving”. Because DT is often treated as a problem-solving approach, the idea of problems being “wicked” is essential to the concept of DT (Neck & Greene, 2011). This idea emphasises problem understanding as an important part in the design process—by that it is essential to structure, shape and understand the problem first instead of just identifying it and then to work towards the solution (Christensen, 2009; Neck & Greene, 2011). Rittel and Weber (1973) suggest that wicked problems are endless in a way that there is never a definite end to the problem-solving process, and as there is no definite solution to a problem, the solution can be only good or bad, or better or worse, but never correct. The idea of wicked problems comes with a special approach or “attitude” towards the problem-solving process (Boland & Collopy, 2004).

Thus, one element of DT is the approach to solving problems in a “human-centred” way, as illustrated in the next section. In contrast to a technology- or organisation-oriented approach, DT puts the human (needs) at the centre of the innovative problem-solving process (Kimbrell, 2012). By putting people first, design thinkers show the ability of empathy to draw upon people’s real experiences and better understand their physical and emotional needs. Empathic design thinkers can, therefore, perceive the world from different perspectives and identify needs that inspire innovation (Blenker et al., 2019; Kimbell, 2012). Therefore, empathy is a centrepiece in defining DT as a human-centred approach to problem-solving (Blenker et al., 2019). In order to solve problems in a human-centred way, the next theme, “prototyping and tangibility”, plays an essential role in getting useful user feedback—and beyond.

DT embraces prototyping to develop and test an idea and obtain useful user feedback as stated by Brown (Brown, 2008): “The goal of prototyping isn’t to finish. It is to learn about the strengths and weaknesses of the idea and to identify new directions that further prototypes might take” (Brown, 2008, p.87). Prototyping, at its core, is about transferring ideas and explorations from a conceptual world towards a physical prototype. By this, prototyping is also a way to build a coherent convergence of different ideas, making it more tangible not only to the potential user but also internally to the project team itself (Brown, 2008). Regarding the fact that DT is often used to solve “wicked problems”, prototyping is a fitting method to approach a solution. “Wicked problems demand an opportunity-driven approach: they require making decisions, doing experiments, launching pilot programmes, testing prototypes, and so on” (Christensen, 2009, p. 20). Furthermore, the prototype (which can be a physical object but does not have to) can be seen as a constitution of a shared language and a way to communicate the idea (Brown, 2008) as well as inspire some further ideation (Sarasvathy et al., 2008). As described in the process models associated with DT, prototyping is included in most of the DT processes (Boland & Collopy, 2004; Brown, 2008). However, the idea of prototyping within design testing goes further than just “testing” and making things tangible. Prototyping in DT is not only used as a method, tool or step in the process; it also can be seen as an

attitude or mentality within this context. In addition, Kelley's definition of prototyping as "thinking with your hands" characterises prototyping as a thinking mode.

DT embraces the doing and fosters an attitude of experimentation (Brown, 2008; Liedtka & Ogilvie, 2011), especially in multidisciplinary teams. Thus, the next theme has been identified as "interdisciplinarity and multidisciplinary teams" as an important element of DT. Building upon the idea of DT to be human-centred, the use of different perspectives is also represented in the ideal DT team, which is multidisciplinary, highly collaborative and not hierarchically structured (Brown, 2008). By this, diverse perspectives are represented internally by a project team with different backgrounds—and beyond by also including specialists' views and outside perspectives (Huq & Gilbert, 2017). This is a recurring theme in the DT literature (Johansson-Sköldberg et al., 2013) especially if DT is presented as a method for innovation (Brown, 2008). The last theme introduced in this paper focuses on "curiosity and creative confidence" as an important element of DT. Creativity plays a key role in the design process (Neck & Greene, 2011; Owen, 2007). In the popular literature, DT is often misunderstood in a way that any creative activity is labelled as DT (Henriksen & Richardson, 2017). Nevertheless, an optimistic, proactive and curious approach to creativity is a key principle of DT in a way that DT is driven by the desire to change things for the better (Henriksen & Richardson, 2017; Owen, 2007). Along with this comes the idea of "creative confidence"; in order to approach "wicked problems", design thinkers are required to be confident and optimistic about their own ability for creative problem-solving (Christensen, 2009). This section summarises the concept of DT in general, while the next section sheds further light on DT within the educational context.

2.2 *Design Thinking Within an Educational Context*

The world is evolving at a faster pace, and education must evolve with it. However, some argue that traditional ways of learning are unable to keep the pace. This demands a new culture of learning that focuses on learning within the world as opposed to teaching about the world. One way to create this culture is to integrate DT into education, as some believe that DT holds major promise in bringing education into the twenty-first century (Melles et al., 2012).

Figure 2 illustrates the different perspectives on a design thinking integration within education. In a similar logic as the design thinking definitions (toolkit/process/mindset) as Fig. 1 and inspired by Huber and Sailer (2016), it illustrates DT within the educational context—as a toolkit for educators, as a course or as a teaching approach. Thus, it reflects the incorporation of DT in education as described by Melles et al., as a course logic, as a course unit, as a seminar or, at its highest level, as an approach to education general philosophy (Melles et al., 2012). Additionally, DT education can be delivered in a design education context (design schools) and other schools, which aim to integrate DT in a non-design context.

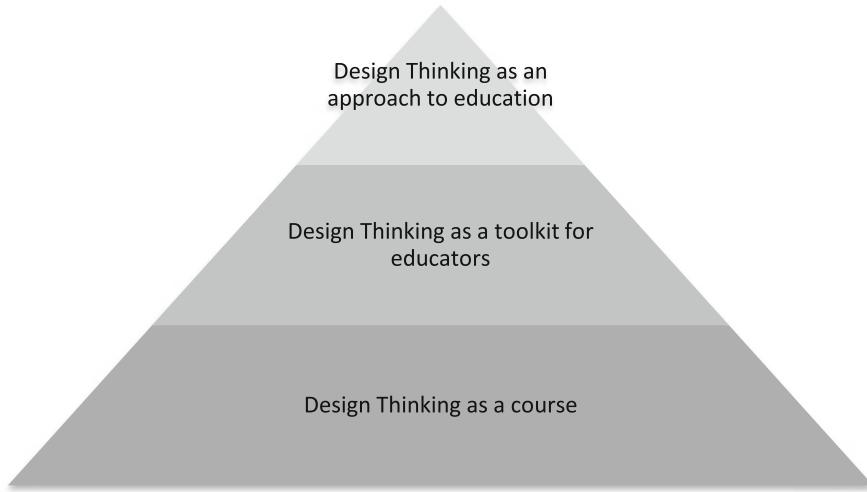


Fig. 2 Different perspectives/levels of DT integration in education, own figure based on (Melles et al., 2012)

While DT can provide a relevant toolkit of methods for educators, it can also aim for a whole new perspective on education. For example, researchers have proposed that the application of DT into business education can address issues and criticisms in business education. The current system of business schools has been criticised because of what is taught, how and to whom it is taught (Huq & Gilbert, 2017). This is not only relevant for business education, as application of DT in the educational context has already spread through many different disciplines (Beaird et al., 2018).

On its basic level, DT tools and methods can be applied in education such as integrating project work using the DT process and methodology and applying DT principles such as prototyping, testing and working in interdisciplinary teams. By this, DT in education will help to “design learning that enables students to work in multidisciplinary teams and enact positive, design-led change in the world” (Rauth et al., 2010, p. 2). Moreover, Rauth et al. (2010) reflected on DT as a learning model and “as a metadisciplinary concept and education model” (Rauth et al., 2010, p.1). Above this, DT can be perceived as a creative approach to education that promotes the idea of teachers as designers.

Besides structuring the level of DT integration in education (Fig. 2), DT education itself can be classified around the following themes and aspects: first, **iteration and learning cycles** are one important theme in DT education. The idea of iterative cycles switching between divergent and convergent thinking modes is key to DT and thus “Design Thinking education, therefore, addresses dealing with these cycles from the beginning on: The procedure of learning and the creation of knowledge within design thinking education are based on highly iterative proceedings” (Rauth et al., 2010, p.2). In this case, Rauth et al. (2010) see an analogy between the iterative

character of DT and the experiential learning theory (and its famous learning cycle) by Kolb. Along with this theme comes the idea of **prototyping** as a new way of thinking about education. Unlike common educational practices, where the “thinking about things” and the “doing things” are separate, the prototyping mindset of DT connects both (Henriksen & Richardson, 2017). Furthermore, learning in the DT literature is often described as learning by doing. Therefore, **project work and experiential learning** play an integral role in DT education. The idea of learning by doing was first introduced by Dewey (1938) as a theory of education, within which learning should be practical rather than theoretical. Rooted in this, educational research has developed this idea into a pedagogical approach called “project-based learning”. The design pedagogy is often based on the so-called studio learning, which basically describes that the students work on concrete projects and by that learn design principles (such as space, form and colour) in an integrated way “on the go” (Welsh & Dehler, 2013). These principles are consistent with the ideas of project-based learning and can be considered as a learner-centred pedagogy that proposes a collaborative, hands-on and active exploration of (real-world) project-based challenges (Gordon, 2013). Project-based learning is more than just the inclusion of a project—the project is a central part of the curriculum, though. This student-centred approach allows students to decide on their path to work on the project, where the project will lead them and what the outcome might be—while the role of the teacher is rather supportive (Gordon, 2013). Although most DT curricula include a mixture of readings and project work, the work on the projects is very important (Melles et al., 2012). In the literature, this is also known as authentic learning, when students are asked to apply the curricular knowledge to an issue related to everyday life (Reeves et al., 2002). Simon (1996) describes that DT education focuses on the use of artificial, tangible things such as boundary objects and prototyping (Welsh & Dehler, 2013).

The role of the student in education based on DT principles is active rather than passive. Students become creators of their own knowledge instead of recipients—in fact, learning in DT is a **student-driven process** (Welsh & Dehler, 2013). By applying DT principles, the students develop their own action paths as part of their learning experience. Due to the nature of design problems, the solution of a problem is not yet given, and therefore the students learn to find the solution by themselves. By this “contestability of any and all ideas (...) students become actively engaged in the construction knowledge” (Welsh & Dehler, 2013). This experience of learning based on DT principles enables students to move from passive recipients to critical and reflective individuals. Along with this comes the **collaborative role of the educator**. DT is a non-hierarchical discipline, and this principle of collaboration affects the role of educators in DT education. Therefore, educators “serve as collaborators, co-learners, and mentors rather than authoritative figures dispensing factual information” (Welsh & Dehler, 2013, p. 778). DT employs the ideas of critical pedagogy, where power in the classroom is decentralised. Welsh and Dehler (2013) described that in a student-driven course design, facilitators conduct “desk reviews” when difficulties arise. In these desk reviews, the teaching team approaches the group to review their progress and give guidelines rather than judgement.

Generally, the role of the teacher in this context can be described as rather passive mentoring than actively advising as it is one important point of design education to let the students maintain ownership of their idea/project.

Furthermore, in DT as a discipline, a **studio-like learning environment** or learning space plays a crucial role in design education. Designers and design thinkers often work in design studios that are typically open, highly collaborative spaces with different sources of inspiration. The room setup is a crucial part of a successful DT project, and the space should represent the principles of DT (collaboration, prototyping and creativity). The importance of a studio setup that meets students' needs is also evident in educational settings. The creation of the physical environment highlights the similarities and common themes between DT and experiential learning (Huber & Sailer, 2016; Welsh & Dehler, 2013). This section offers an overview of DT within an educational context, while the perspective of DT in EE is further illuminated in the following section.

3 Perspectives and Themes on the DT/EE Nexus

Since this chapter focuses on further conceptualising the interface of DT and EE, this section examines the existing literature in this field and gives an overview of the recurring themes. Several developments have resulted in a greater focus on conceptual links between DT and EE, as well as on entrepreneurship practice, entrepreneurship research and entrepreneurship pedagogy (Sarooghi et al., 2019). Research conducted on the interface of creativity and business illustrated analogue characteristics of designers and entrepreneurs such as experiential learning, mindsets and non-linearity (Penaluna & Penaluna, 2009). Recently, researchers have described the entrepreneurial ways of designing and designerly ways of entrepreneurship (Klenner et al., 2021). Developments such as the effectuation theory by Sarasvathy (2001), which heavily uses DT principles in its study of the entrepreneurial decision logic, as well as the lean startup approach, have contributed to the increasing use of a DT philosophy in EE curricula (Sarooghi et al., 2019). Dorst (2011) refers back to the terms "entrepreneuring" and "effectuation" when describing the process of creating new frames for problem-solving in design.

Clearly, the concept of DT shows parallels to the current debate on how to design and teach EE (Huber & Sailer, 2016). Despite the wide popularity and application of DT in the entrepreneurship practice, the interface of entrepreneurship and DT has not been discussed sufficiently in academia (von Kortzfleisch et al., 2013). While this research gap still exists, there are some publications contributing to the EE and DT nexus. These publications either present a conceptual model for the interface (Nielsen & Stovang, 2015; Sarooghi et al., 2019; von Kortzfleisch et al., 2013), compare different entrepreneurial methods (Mansoori & Lackéus, 2020) or focus on describing a case study of the utilisation of DT in entrepreneurship course design (Gordon, 2013; Nielsen & Stovang, 2015). In order to bridge this research gap, common

themes and a conceptualisation of the interface are illustrated in the following section.

4 Conceptualisation: Levels of Interface

4.1 *Conceptual Interface: Common Themes of Entrepreneurship Education and DT*

The conceptual nexus of both shows parallels in their core ideas and thinking modes of being human/problem centred, iterative and value creation oriented. Indeed, the boundaries between the disciplines are blurring as design is shifting towards a self-understanding beyond the pure design context and entrepreneurship transforming from a narrow management perspective towards a more holistic self-conception. Entrepreneurs can be seen as the designers of organisations who also design the world we live in (Sarasvathy et al., 2008). Thus, Mansoori describes the new perspective on entrepreneurship (as a domain that is “intentional, systematic, strategic and guided” (Mansoori & Lackéus, 2020, p.21)) as a perspective that has great commonalities with design science. In this section, the conceptual nexus and common themes identified within the literature are illustrated.

First of all, Sarasvathy and Vankataram (2011) described the scientific method as an analogue to the entrepreneurial method. The same has been applied to design attitude vs. scientific attitude (Owen, 2007). This way of thinking embraces the **divergent thinking mode** which is further expounded by Boland and Collopy (2004) who distinguish between a design and a decision attitude. While the decision attitude perceives problems as stable, the design attitude approaches a problem with the creation of new opportunities (Boland & Collopy, 2004; Huq & Gilbert, 2017). Further, Sarasvathy et al. “posit effectuation as an entrepreneurial logic for designing artifacts (...)” (Sarasvathy et al., 2008, p. 331). When comparing the effectuation logic (Sarasvathy, 2001) with the DT process model of the Double Diamond (Design Council, 2005), both concepts endorse the divergent thinking mode in the context of making opportunities by creative discovery (Sarasvathy et al., 2008).

Second, DT and EE show a high conceptual overlap as both emphasise **value-orientation and creation with limited resources**. This aspect has been described best by Simon saying “everyone designs who devises courses of action aimed at changing existing situations into preferred ones” (Mansoori & Lackéus, 2020, p. 111). This emphasis on value creation is represented in EE by the understanding of entrepreneurial action as the making of a positive difference (Sarasvathy & Venkataraman, 2011). Both concepts embrace value creation for other stakeholders (Johansson-Sköldberg et al., 2013; Mansoori & Lackéus, 2020; Sarasvathy et al., 2008). Similar to designers, entrepreneurs also use certain methodologies to solve complex problems and realise their aspired ideas in a process of world-making (Klenner et al., 2021; Mansoori & Lackéus, 2020). Further, both disciplines mention

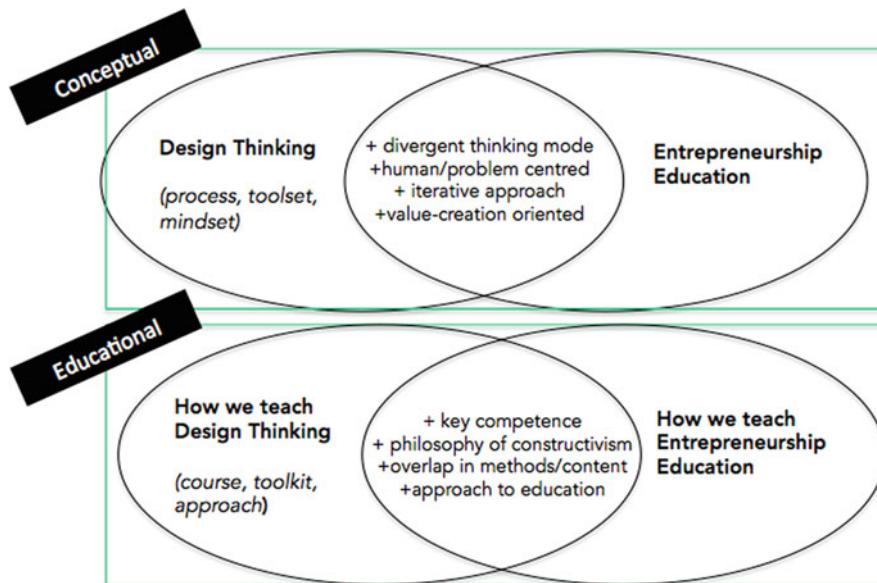


Fig. 3 Conceptualisation of the interface and core principles

the innovation and value creation process within the context of limited resources and an uncertain environment. Both in DT and in EE, problems are “wicked”, and therefore, the **iterative problem-solving** process relies on the subjective facilitation of individuals’ decisions (Klenner et al., 2021; Sarasvathy et al., 2008). Iteration is a core principle of all formalised DT process models (Brown, 2008; Design Council, 2005; Neck & Greene, 2011). Accordingly, Mansoori compares the nature of the entrepreneurial problem space with design: “As such, akin to domains such as design, entrepreneurship should be guided by rules, principles, heuristics and methods that are distinct and suitable for solving structured and ill-structured aspects” (Mansoori & Lackéus, 2020, p. 24) (Fig. 3).

4.2 Educational Interface of DT and EE

The interface between DT and EE shows a high level of overlap regarding their general educational philosophy, their similar understanding as a key competence and their actual teaching methods and pedagogical approach regarding the role of educators and students. First, reflecting on the evolution of both, DT and EE both have shifted from a rather specialist view towards a more generic understanding as a **key competence** that is relevant to everyone. While DT moved the idea of designerly thinking towards describing a way of thinking and doing beyond the design context (Henriksen & Richardson, 2017; Johansson-Sköldberg et al., 2013),

EE shifted its view from narrow to a wider and more holistic understanding as a way of thinking (Sarasvathy & Venkataraman, 2011). This shifting might be because both claim to transfer key competencies for the twenty-first-century learner such as the ability to solve open and complex problems in a creative and innovative way. Through this, both disciplines became relevant to “everyone”, and today both argue to be important beyond their traditional field of practice. DT has emancipated and freed the designerly way of thinking from being only relevant to designers, while EE is in the middle of a process of teaching entrepreneurship across disciplines (Sarasvathy & Venkataraman, 2011). At this point, EE and DT have a unified mission and can play an integral role in a possible new way of understanding education in general. Further, regarding the underlying **educational philosophies**, DT and EE both build upon the influences of constructivism such as experiential learning, critical pedagogy and active learning (Dewey, 1938; Gabrielsson et al., 2020; Neck & Greene, 2011). Concerning the actual use of teaching methods, one of the recurring themes is the focus on project-based learning. Most DT curricula make use of project work on real-life cases (Henriksen & Richardson, 2017), and the engagement in real-life opportunities is also shown in EE (Pittaway & Edwards, 2012). Both concepts demonstrate a high level of “doing” in the experience of education by teaching the subject through the creation of experiences in practice (Neck & Greene, 2011). Moreover, both EE and DT embrace the use of continuous and iterative learning cycles by making feedback from others an integral part of the learning process (Rauth et al., 2010).

5 Conclusion and Further Research

This chapter questions whether the integration of DT within EE is temporary or a substantial contribution to pedagogy. It is no coincidence that EE “has been one of the pioneering fields in the implementation of design thinking” (Sarooghi et al., 2019). The literature review has illustrated substantial common themes and core principles in both conceptual and educational dimensions. This reinforces the fit of DT as a possible permanent addition to EE (Sarooghi et al., 2019). An investigation of DT has provided more theoretical sensitivity around the concept by illuminating three different perspectives: tool, process or mindset view (Sarooghi et al., 2019). This richness of the concept is also represented in education at the level of the course, toolkit and educational approach.

Regarding the conceptual and educational nexus, this paper has identified common principles at the DT/EE nexus: iterative learning cycles (Rauth et al., 2010), project-based learning in the sense of experiential learning (Linton & Clinton, 2019) and learning as a student-driven process with the teacher in the role of a collaborator (Neck & Greene, 2011). While DT and EE have similar core values of educating discovery processes and creation of innovation, the boundaries between both even blur more recently, due to the conceptual shift of EE from venture creation towards a value creation focus. The current state of the art is divided into two modes:

discussing conceptual models for the interface (Nielsen & Stovang, 2015; Sarooghi et al., 2019; von Kortzfleisch et al., 2013) or describing case studies of the utilisation of DT in entrepreneurship course design (Linton & Klinton, 2019; Nielsen & Stovang, 2015). Single case studies and studies of exemplary course design are the most numerous (Huber & Sailer, 2016; Kremel & Wetter Edman, 2019; Linton & Klinton, 2019). While it is apparent that there have been valuable contributions to the field discussing DT within EE from different perspectives, this paper contributes to the recent debate by illustrating a more profound perspective on the EE/DT nexus and providing further insights for conceptual clarity.

These findings call for more research as current research focuses on analysing single case studies without a curricular or comparative analysis. Most case studies also provide relevant insights for practitioners on how to include DT in the EE curriculum, but their conclusions often rely on single examples and have not been tested in a wider context (Huber & Sailer, 2016; Linton & Klinton, 2019; Nielsen & Stovang, 2015). Also, there is a need for an understanding of the current implementation of DT in EE practice (Sarooghi et al., 2019). Recent research has answered the question of whether entrepreneurship educators are integrating DT into their curricula. Also, recent research has applied a survey-based approach in order to demonstrate the application of DT among entrepreneurship educators, and the current state proves that entrepreneurship educators are indeed using DT frameworks (Kremel & Wetter Edman, 2019; Sarooghi et al., 2019). However, as this review has shown, the existing variety of DT definitions and myriad perspectives calls for a more detailed and deeper examination of DT integration. Therefore, the questions need to be raised on how, why and from which perspective (tool, process, mindset/course, toolset, approach) entrepreneurship educators make use of DT. Further research is needed to bring convergence to a common understanding of the value of DT for EE.

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Entrepreneurship Education in Digital Environments: Developing a Didactic Framework for a New Era



Ronny Baierl and René Thamm

Abstract This chapter introduces a new didactic framework on entrepreneurship education in digital environments. We base our arguments on theoretical insights gained by the literature on didactics in general and on entrepreneurship education in particular. In addition, we include practical experiences gained by two successfully delivered summer schools, in the real world and in the digital world, and our expertise based on lectures at our university. As a result, our framework covers five dimensions in which several aspects of digital and nondigital competencies are trained. We discuss our framework and suggest fruitful avenues for educators and researchers in the field.

Keywords Digital and nondigital competencies · Hybrid teaching · Hybrid learning · Team collaboration · Role models · Simulation

1 Introduction to Entrepreneurship Education

The impact and need for entrepreneurship education at higher education institutions are still an important part in academic discussions. The relationship between entrepreneurship education and entrepreneurial competencies and entrepreneurial intention represents one of the key issues here. This relationship is affected by several factors. Within that chapter we follow the established perception that entrepreneurs are made, not born (Gorman et al., 1997; Ernst & Young, 2011), and that entrepreneurship programmes generate a positive impact (Galloway & Brown, 2002; Nabi et al., 2017; Li & Wu, 2019; Wei et al., 2019; Boubker et al., 2021).

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Recent data provided by the Global Entrepreneurship Monitor underline the rising number of entrepreneurship professorships reflecting an increasing relevance in Germany. The results also show that participants still perceive their preparation for successful business creation and their required capabilities to be at a relatively low level (Bosma et al., 2021; Sternberg et al., 2021). This finding calls for continuous improvements in the field of entrepreneurship education. Especially from an international perspective, the way entrepreneurship is taught differs across universities to a great extent (Fayolle & Klandt, 2006). Even though applied or ‘hands-on’ teaching methods promise more effective teaching (Gorman et al., 1997; Edelman et al., 2008), classical lecturing is still a common method. As an example, while entrepreneurship research clearly points out the moderate value of written business plans, seminars on ‘how to write a convincing business plan’ are still incorporated in many university programmes.

Although entrepreneurship education has manifold facets, educational programmes unite the intention not only to teach management tools but also to form personalities and promote entrepreneurial attitudes (Fretschner & Weber, 2013; Kuckertz, 2013). Thus, entrepreneurship education should support entrepreneurial competencies and entrepreneurial intention as the best predictor of subsequent behaviour.

Our work is a further addition to the development of a holistic entrepreneurship education approach. For doing so, recent literature considers different perspectives (Maritz & Brown, 2013; Fayolle, 2013; Klapper & Neergaard, 2017): for example, ‘why’ looks at the goals and objectives of the programme. ‘What’ discusses the needed content to improve entrepreneurial competencies, and ‘how’ deals with the used didactic methods. Furthermore, among other perspectives, the programme has to be tailored to the target audience (‘for whom’) and take the place of learning and teaching (‘where’) into account. Within that chapter we focus on ‘where’ and ‘how’:

- Where: entrepreneurial learning is not limited to a physical classroom. Digital learning environments play an increasingly important role, as digital skills become more relevant as core competencies for entrepreneurs.
- How: the pedagogical methods used in entrepreneurship education should be mixed. This involves passive and action-oriented teaching as well as problem-solving in real-life situations (Nabi et al., 2017; Mwasalwiba, 2010).

This chapter describes the five dimensions of our developed teaching approach and evaluates their impact on digital and nondigital competencies from our perspective. The introduced approach is a result of analysing international research. Moreover, we included the experiences and students’ feedback from a summer school with the German Jordanian University that took place prior to the COVID-19 pandemic, from virtual joint teaching with students from the same university and our university in 2020 and from planning joint hybrid teaching in 2021.

2 Digital and Nondigital Competencies for a New Framework

The desired outcome of our teaching approach is aligned with the future skills framework developed by the Stifterverband in collaboration with McKinsey & Company (Kirchherr et al., 2019). This framework aims to outline the needed abilities for tomorrow's world of work. The suggested set of core competencies can be distinguished into technical, digital and nondigital skills. We explicitly respect nondigital skills that cover a wide range of what is well known as the entrepreneurial mindset (Bacigalupo et al., 2016), including problem-solving, creativity, entrepreneurial action, self-initiative, adaptability and perseverance.

In complement, digital skills should receive more attention, as acting confidently in digital environments is crucial for entrepreneurs. These skills include the competence of digital knowledge acquisition (digital learning) and the ability to work effectively and agilely in virtual teams (digital collaboration and agile work) by utilizing adequate communications (digital interaction). In addition, digital literacy reflects the increasing relevance of safety rules and data protection. Digital ethics stands for a critical analysis of one's own digital activity (Kirchherr et al., 2019).

At its core, our framework consists of five dimensions and follows an applied and 'hands-on' didactical approach (Kuckertz, 2013). As 'doing is better than learning', we focus on realizing own entrepreneurial projects that affect the knowledge and entrepreneurial motivation of students. The following sections describe the main idea of each dimension and discuss the effects on digital and nondigital skills.

2.1 Dimension 1: Hybrid Teaching

From the very beginning, our summer school was built up on various teaching approaches. Considering the different knowledge bases of our audience, we combined passive and active teaching elements. Thus, the curriculum includes keynote speeches to inform students about recent entrepreneurship methods and tools from textbook-based theories and models (Gassmann et al., 2020; da Rin & Hellmann, 2020). Simultaneously, every theoretical input was expanded with appropriate exercises. From our perspective, students should be guided step by step to enable them to develop a business idea (e.g. design-thinking methods), describe their business model (e.g. business model canvas) and understand the financial consequences of its implementation (e.g. financial planning). In addition, to ensure active participation and simulate real-life experiences, we used a business simulation (see Sect. 2.5) as the second part of our summer school.

In 2019, when the summer school took place for the first time in Amman, we ran the whole curriculum face-to-face. One year later, the COVID-19 pandemic forced us to completely shift to a distance learning approach. Encouraged by empirical results indicating similar learning outcomes from face-to-face vs. distance learning

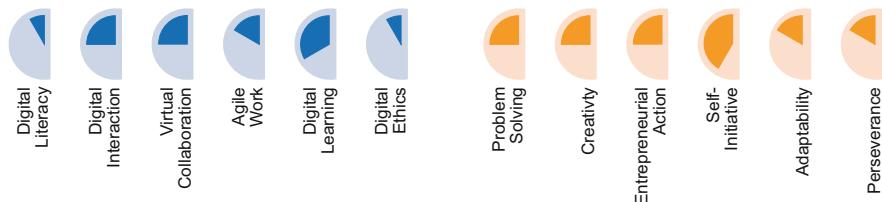


Fig. 1 Consequences of hybrid teaching

(Means et al., 2013), we took the opportunity to adjust our teaching focus by including the development of digital skills. First, the keynote speeches were recorded and made available in an online library. Additionally, we motivated our students to search for more information in digital databases and pointed to the reliability of sources. Second, weekly video conferences were established to provide a platform for coaching, feedback and explaining the forthcoming tasks. Third, guest speakers were invited to join the conferences, and business idea pitches were performed online (see Sect. 2.4).

Online teaching of the entrepreneurial mindset is challenging (Liguori & Winkler, 2020). Fortunately, the utilized simulation is cloud-based and, thus, very appropriate for distance learning. Nevertheless, creating an active, constructive, and collaborative online learning environment is challenging. Our experience shows that success mainly depends on the previous digital experiences of students. In entrepreneurship education programmes, E-learning elements may provide an extra advantage to support self-determined acting. Nevertheless, undergraduate students may especially suffer from overtraining. Therefore, we recommend either choosing a blended learning approach or offering a complementary course of basic digital working skills in advance. As a result, especially, digital learning and self-initiative benefit from this approach in our understanding as shown in Fig. 1.

2.2 Dimension 2: Intercultural Team Collaboration

‘[T]he “entrepreneur” in entrepreneurship is more likely to be plural, rather than singular’ (Gartner et al., 1994). In addition to the high popularity of that quote by Gartner and colleagues, the implication for entrepreneurship education is as concise as the quote itself: entrepreneurship must be taught in teams. Consequently, we included the advantages of team cooperation in our framework, as do many educators do (Li & Wu, 2019). In addition, we included intercultural aspects by composing teams of students from different cultural backgrounds and geographical origins (Stefanic et al., 2020).

Despite the numerous advantages of such an intercultural approach in terms of the intercultural competences acquired by participating students, geographic distance is of great importance to our framework, as it forces participants to communicate in

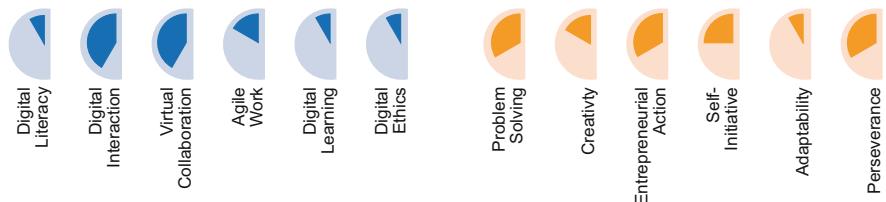


Fig. 2 Consequences of intercultural team collaboration

digital rather than in real rooms. As we have learned in prior projects, students typically prefer real appointments instead of virtual appointments when they live close to each other. As a concrete (pre-COVID-19) example, students living in the same town but studying at different universities rejected the use of virtual meetings. Instead, they preferred to meet each other at one of the participating universities or at common leisure meeting points (Clauss et al., 2020).

Entrepreneurship educators often discuss how team composition should be organized: self-combined teams may benefit from interpersonal advantages, while randomly selected team members typically show greater heterogeneity that is clearly beneficial in entrepreneurial contexts. Despite the obvious advantages of self-selected team membership in other contexts, we decided to follow a team composition approach in which team members are selected by educators (Mannix & Neale, 2005).

We decided to include the concept of diversity fault lines as it acknowledges the multivariate nature of diversity. Thus, we focused on origin and gender as the two most prominent variables describing our students (in fact, age and experience were very homogeneously distributed). Except for these two variables, team composition was random. In other words, we composed the teams in such a way that female and male students were mixed; the same held true for the origin (German and Jordanian) of the participating students and especially for the combination of both variables. In the understanding of diversity fault lines, we avoided situations in which, for example, two German male students belonged to a team with two Jordanian female students; as such a team would obviously generate strong diversity fault lines (Thatcher et al., 2003). As a result, digital interaction and virtual collaboration on one side and problem-solving, entrepreneurial action and perseverance on the other side benefit from such a setting in our understanding as shown in Fig. 2.

2.3 Dimension 3: Hybrid Learning

Based on our hybrid teaching approach discussed in Sect. 2.1, we included a second dimension of hybrid environments in our framework: hybrid learning accounts for the students' perspective and, thus, complements the hybrid teaching perspective in a



Fig. 3 Consequences of hybrid learning

holistic understanding. To do so, we offered a rich spectrum of available tools and online platforms to our students.

First, we utilized generalistic platforms, including a self-developed learning platform that is used by Saxonian universities, online whiteboards and team collaboration software, as well as general communication platforms. Our experience shows that students prefer the learning environment that is typically used at their universities. If two (or even more) universities collaborate, focusing on established and easy-to-use platforms is advisable to prevent students' rejection. Within such platforms, several tools can typically be implemented for virtual collaboration. As students prefer different tools, the participants themselves should make the exact selections. In other words, forcing students to use a specific tool is not advisable, as it can lead to unintended refusal.

This is especially true in regard to communication: in our case, students automatically switched to a free-of-charge messenger service that is used by more than 2 billion people in over 180 countries instead of using the communication tools available in our learning platform. In addition to (negative) consequences in terms of not collectable learning analytics, aspects of digital ethics should be faced. In fact, we see a great potential for sensitizing students regarding aspects of data privacy and secure data transport. This is especially important in international settings, as national regulations and experienced usage may differ dramatically.

Second, we included an entrepreneurship-specific platform (Huebscher & Lendner, 2010) for our simulation approach (see Sect. 2.5). As this platform is new to every participant, it is necessary to include a focused introduction to point out specific aspects, either online or offline. However, it is not necessary to include a detailed step-by-step tutorial for each and every functionality here. Based on our experience, students often get bored when showing functionalities in detail instead of delivering a comprehensive overview. By including this platform, digital competencies, especially in terms of digital self-confidence and self-reliance, are pronounced. As a consequence, hybrid learning environments especially support digital interaction and virtual collaboration and enable problem-solving and adaptability in our understanding as shown in Fig. 3.

2.4 Dimension 4: Entrepreneurial Role Models

Several studies emphasize the importance of confronting students with role models (Toledano & Urbano, 2008; BarNir et al., 2011; Mueller, 2011). Although family role models have outstanding relevance (Carr & Sequeira, 2007), additional role models promise positive effects. Thus, we invited entrepreneurs and small business managers not only as guest speakers but also as representatives of fictive investment companies during our pitch presentations. In other words, sharing their experiences is only one side of the coin. We aimed to stimulate communication with our students by involving these role models in the learning and assessment process. Additionally, we provided an informal forum for individual support, feedback and networking.

As perceived distance between students and role models may evolve negative effects, we explicitly considered age and a comparable personal history when choosing the role models (Kuckertz, 2013; Liu et al., 2019). To ensure the highest possible identification, alumni of involved universities are suitable contacts. Although sometimes a higher impact of success than failure stories is reported (Liu et al., 2019), we recommend the inclusion of both sides of the story to draw a realistic picture of entrepreneurial career paths (Abbasianchavari & Moritz, 2021).

Finally, lecturers play an important role. As coaches and facilitators, they accompany and navigate students through the entrepreneurial learning process, demonstrate openness to explore, test new frameworks and increase the awareness of entrepreneurship as a valuable carrier choice (Mueller, 2011; Rahman & Day, 2015). Integrated role models have a stronger effect on entrepreneurial desirability than on entrepreneurial feasibility (Fellnhofer & Puimalainen, 2017). Therefore, this dimension mainly contributes to self-initiative and entrepreneurial action in our understanding as shown in Fig. 4.

2.5 Dimension 5: Business Simulation

As already mentioned in Sect. 2.3, we utilized entrepreneurship-specific simulation software and, thus, added elements of gamification to our framework (Isabelle, 2020). Although several good and very good simulation tools are available at the market, we chose the software of a Germany-based, well-established provider of

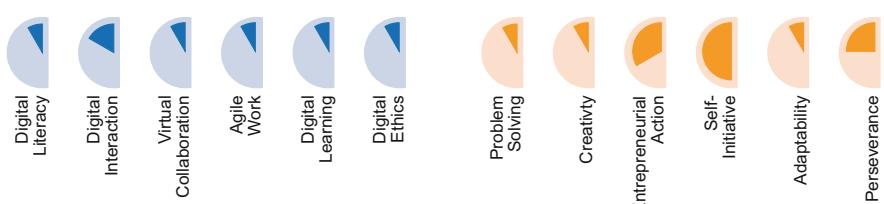


Fig. 4 Consequences of entrepreneurial role models

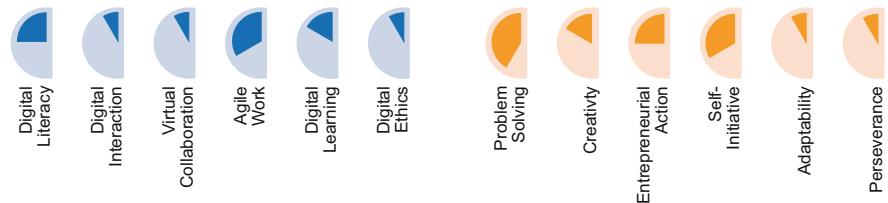


Fig. 5 Consequences of business simulation

management simulations. The selected software is beneficial to our didactic framework in three dimensions.

First, the selected software combines a classic simulation approach with more entrepreneurial and creative aspects. In fact, the programme includes the well-known business model canvas (Osterwalder & Pigneur, 2010) within the first phase. Based on the entries within that framework and (fictive) negotiations with investors (see Sect. 2.4), the instructor of the simulation may manually change the simulation's settings. As an example, as innovativeness cannot be evaluated by software automatically, the instructor may evaluate the business model canvas in that dimension. In turn, she/he is allowed to change the innovation index, for example, by adding ten points. The same holds true for the amount of money invested and many other variables. While this procedure requests a well-trained instructor (in fact, participating in one of the provider's official trainings is advisable), the advantages are overwhelming: standard values for subsequent simulation can be adjusted in such a way that individual (either creative or entrepreneurial or financial) aspects are acknowledged (Topsim Startup, 2019).

Second, a business model canvas workshop represents a perfectly fitting starting point. Depending on the participants' prior knowledge, such a workshop can take place in real or in virtual rooms. Based on our experience, we advocate for a face-to-face approach. During such a workshop, the newly composed team may benefit from real-world interactions, such as from the advantages of talking to each other in presence. Nevertheless, the business model canvas workshop can be virtualized if required.

Third, the subsequent simulation phase closely corresponds to traditional management simulations. In other words, this phase represents the transition from initiating the pre-start-up phase to managing the growth phase and, thus, accounts for organizational ambidexterity as a concept to utilize exploration and exploitation in parallel (O'Reilly III & Tushman, 2013). From our perspective, shortening that phase from six to four periods is advisable. As a result, especially, agile work and problem-solving benefit from that dimension in our understanding as shown in Fig. 5.

3 Summary of Digital and Nondigital Competencies

As shown above, each of the five dimensions of our didactic framework targets several aspects of digital and nondigital competencies. In summary, we aggregated the illustrated consequences in such a way that, in total, the maximal value of every competence is acknowledged. This procedure represents the compensable nature of actions on competencies. Figure 6 provides an overview of consequences.

In detail, the dimensions of our framework focus strongly on digital interaction and virtual collaboration. Digital literacy, agile work and digital learning are also targeted by our framework. As already mentioned in Sect. 2.3, aspects of digital ethics play only a minor role. In fact, when starting with our projects, we expected that, for example, digital information and their value would not truly play an important role in our setting. Nevertheless, we have learned that aspects of data security and accessibility are of great importance, especially in international contexts. Thus, we call for a better inclusion of this important digital competence in future projects.

On the other hand, the dimensions of our framework underline self-initiative, problem solving and adaptability. In fact, this is completely in line with our understanding of entrepreneurship education programmes. Additionally, entrepreneurial action and perseverance are supported by our framework. As we decided to include existing simulation software, creativity can be covered to only a limited extent. In fact, an important prerequisite for running managerial simulations is a common database. Therefore, the software used in our project offers the same background information and the same start-up environment to every participant (startup.topsim.com/en, 2023). Although all teams work on the same (fictive) start-up, the generated results in terms of creativity are remarkable. Nevertheless, focusing on real start-ups and own innovations may be advantageous in other contexts.

This chapter was set out to deliver a didactic framework for entrepreneurship education practitioners. Therefore, the introduced approach helps entrepreneurship education practitioners develop their own entrepreneurship programmes – in a national or international context, as a curricula course or a comprehensive summer school or taught alone or with colleagues. Our results represent a valuable guideline to develop a best fitting programme for several circumstances instead of delivering a ‘blueprint for the best entrepreneurship education programme’. In other words, its implications are mainly practical in nature. Nevertheless, researchers may benefit

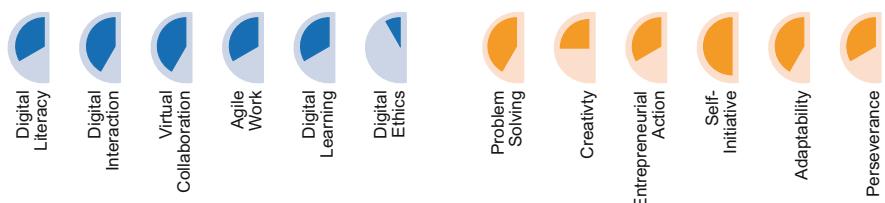


Fig. 6 Overview of consequences

from our framework in two dimensions. First, the structure may be beneficial for subsequent research projects in the field. Second, the limitations of our approach deliver fruitful avenues for further research. Especially the subjective evaluation of the consequences in each dimension may benefit from a more rigorous way of measurement.

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Sport as a Vehicle for Entrepreneurship Education: Approaches and Future Directions



Louis Moustakas and Stephen Reynard

Abstract The use of sport and physical activity as a method of developing entrepreneurship is an area that has received considerable attention in recent years. This is evidenced, in part, by the proliferation of sport-based education manuals on entrepreneurship from development agencies, NGOs and business actors alike. Moreover, several organisations operate in the sport for development ecosystem that focuses on sport-based entrepreneurship and developing social businesses in and through sport, including *Sport dans la Ville* and the Yunus Sports Hub. These programmes and existing literature show different approaches to using sport and physical activity to promote entrepreneurship. These approaches raise specific questions that should be considered when implementing sport for entrepreneurship programmes. Combining findings from academic and practitioner literature as well as considerable experience in the field, this chapter will present three approaches to using sport to develop entrepreneurship and highlight critical questions and concerns related to each approach. These approaches include (1) using sport as a hook to attract youth to entrepreneurial education, (2) using sport activities to develop competences related to entrepreneurship and (3) providing specialised education and support to sport entrepreneurs. To conclude, we propose a number of recommendations on how to maximise the potential of using sport for entrepreneurship education and development.

Keywords Sport for development · Entrepreneurship education · Sport · Employability

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1 Introduction

Both at the national and international levels, there has been growing recognition from governments, NGOs and development organisations of the potential for sport to contribute to sustainable socio-economic development. Most significantly, the UN's Agenda 2030 explicitly recognise the potential of sport to contribute to the Sustainable Development Goals (Wespi et al., 2015). This recognition comes from two fronts. First, there is an understanding that sport provides a practical, physical and interactive setting that allows for experiential learning and the development of knowledge, attitudes and skills. Indeed, due to its widespread appeal as a "shared cultural manifestation", relatively low cost and interactive nature, sport has been presented as a vehicle to support development across a wide range of areas (Beutler, 2008; Cardenas, 2013). In particular, participation in sport-based social interventions or experience as an athlete has been connected to a wide range of attitudes or skills such as self-esteem, discipline, resilience, leadership, decision-making or teamwork (Moustakas & Kalina, 2021; Steinbrink et al., 2020; Weiss et al., 2013; Williams et al., 2022).

Second, the sport industry presents significant potential for economic growth and development. It is one of the fastest-growing industries globally, encompasses a broad range of sub-sectors and connects to several other industries (Ratten, 2018). Worldwide, the sport industry is valued at over 500 billion USD (The Business Research Company, 2020), and many countries, such as Indonesia or Botswana, have identified sport as a prime area for economic diversification and growth (Moustakas & Işık, 2020; Putri & Moustakas, 2022). As such, business literature highlights the need for entrepreneurship to support the overall growth and development of the sport sector itself (Ratten, 2018).

Likewise, entrepreneurship is widely considered an essential engine of societal and economic growth (Gries & Naudé, 2010; Weiss et al., 2013). The United Nations (UN) recognises that entrepreneurship can contribute by "creating jobs and driving economic growth and innovation, fostering local economic development, improving social conditions and contributing to addressing environmental challenges". Given the importance of entrepreneurship as a vehicle for growth and the perceived developmental potential of sport, it is no surprise that a growing number of programmes have attempted to use sport as a vehicle to support entrepreneurial development and education in their communities. Numerous NGOs that work at the intersection of sport, social development and entrepreneurship have emerged. These include the likes of Sport dans la Ville, which combines practical sport activities, institutional networks and individual support to develop entrepreneurs across France (Entrepreneurs dans la ville, 2021). Elsewhere, the Yunus Sports Hub provides incubation, training and events to support socially oriented sport businesses (Yunus Sports Hub, 2021).

Correspondingly, numerous manuals and curricula have emerged to formalise the connections between sport and entrepreneurship and specifically outline how sport itself can be used as a driver of entrepreneurial education. These include manuals

from business, civil society and governmental agencies alike, such as the Swiss Academy for Development (Wespi et al., 2015), Standard Chartered (Standard Chartered, 2020) or Kick for Life (Fleming & Braun, 2020). Broadly speaking, these manuals propose a variety of adapted games and sport activities that provide opportunities for experiential learning and support the development of several entrepreneurship-related life skills.

Yet, despite the growing connection between sport and entrepreneurship education, the nascent nature of this area leaves us with gaps in our knowledge and understanding, especially as it concerns the intersection between sport and entrepreneurship education outside of the higher education context. As other authors have noted, there is a need for more research around “how sport educators are effectively utilising entrepreneurship” (Ratten & Jones, 2018) and the “role sport entrepreneurship education plays in society” (Ratten & Thukral, 2020). In this chapter, we aim to contribute to these discussions by outlining three of the main approaches to entrepreneurship education in sport. In doing so, we hope to provide a basis for future research and development of approaches within sport entrepreneurship education.

The approaches we are documenting here are located outside the higher education sector and primarily engage youth as their primary target audience. As such, we are mapping a part of the widening “scope of entrepreneurship education” (Kuckertz, 2013). To do so, we will focus on the pedagogical and programmatic components of these approaches, their benefits and their challenges. In particular, we are informed by the teaching models presented by authors such as Fayolle and Gailly (Fayolle & Gailly, 2008) or, later, Maritz and Brown (Maritz & Brown, 2013), as well as the framework of entrepreneurship competencies developed by Lackeus (Lackeus, 2014) and the assessment types identified by Block and Stumpf (Block & Stumpf, 1990).

Though this chapter is discursive in nature, our findings and observations are supported by our extensive experience in the field, academic literature and programme materials. Moving forward, we will first present the three main approaches to entrepreneurship education in and through sport and briefly discuss the challenges and opportunities inherent to each. Afterwards, we will conclude by proposing some overarching recommendations regarding how practice and research can help maximise the potential of using sport for entrepreneurship education and development.

2 Approaches to Entrepreneurship Education in and Through Sport

There are subtle yet fundamental differences in terms of how organisations use sport to contribute to or promote entrepreneurship education. The following categorisation of approaches does not claim to be comprehensive, nor does it seek to promote one approach over the other. Rather, this categorisation aims to highlight the range of

approaches that exist. The categories have been identified based on trends that we have observed through our involvement as researchers and practitioners in the field of sport for development (SFD). The first approach is attracting youth to entrepreneurial education through sport. The second is developing entrepreneurial skills through sport-based experiential learning activities. The third is providing specialised training for young people to become sport entrepreneurs. For each of the approaches, we provide an overview, including the context, objective(s), audience(s), assessment, content, pedagogies and outcomes, as well as the benefits and challenges of each approach.

2.1 Parallel Programming

Arguably the most intuitive and easy-to-understand approach, parallel programming uses sport's appeal to attract young people to entrepreneurial education. In this approach, a sport programme is made available to young people alongside an entrepreneurship education programme. Here, sport is essentially used as a "hook" in order to "use the momentum in and around sport as a strategic vehicle to communicate, implement, and achieve nonsport development goals" (Schulenkorf et al., 2016). This approach is relatively easy to establish within organisations as the need for specialised training is relatively low compared to the second and third approaches. In short, access to sport is provided, ideally supervised or taught by someone with a background in sport or physical education, in addition to entrepreneurship education. Through this, young people gain access to both entrepreneurship education and sport programming, both of which can significantly contribute to the holistic development of young people. This approach is also intuitive and, therefore, easy for funders and programme evaluators to understand. Further, this approach can help increase the accessibility and attractiveness of entrepreneurship, which can be especially valuable in contexts where high youth unemployment makes entrepreneurship or self-employment a necessity. Table 1 provides an overview for the model of parallel programming approaches.

The French NGO *Sport dans la Ville* provides a good example of this approach through its *Entrepreneurs dans la Ville programme*. From a programmatic perspective, the sport and entrepreneurship programmes are separate, but the sport programme is used as a hook to attract youth towards the entrepreneurship programme. The entrepreneurship programme itself lasts for 5 months and supports disadvantaged young people in setting up their own companies. To enter into the programme, prospective participants must first pitch their business ideas to *Sport dans la Ville*, and only a limited number of applicants are selected (Entrepreneurs dans la ville, 2021; Forrest & González-Vallés, 2017). These pitches, however, do not need to be explicitly connected to sport. Once in the programme, participants are provided education on, amongst others, marketing, opportunity and resource skills such as financial management, communication and business planning.

Table 1 Model for parallel programming approaches

Context	Community organisations, local or international NGOs
Objective(s)	To attract young people to entrepreneurship education or incubation by offering a complementary sport programme. In some contexts, mere access to sport infrastructure and equipment can appeal to young people to enrol in a programme
Audience	Young people seeking informal or formal education who are also interested in sport or physical activity. This approach could also target young people who are no longer in the education system and are not working or being trained for work (NEET)
Assessment	Assessment during the programme (e.g. number of participants, number of sessions, frequency of participation) Assessment immediately after the programme (e.g. examinations, presentations, surveys)
Content	Entrepreneurship education and sport or physical education curricula
Pedagogies	Specific to entrepreneurship education and sport or physical education. In the case of the former, this can mean coursework, project-based learning or inviting entrepreneurs and industry leaders to share their experiences and insights that would strengthen the quality of the educational programme
Outcomes	Young people participate in entrepreneurship education or incubation and receive the health, personal and social benefits of participating in sport

Another example of this approach is the Agora Koumassi project where a multisport complex was built in a populated neighbourhood of Abidjan, Ivory Coast. NGOs and companies can rent out the sport facilities as well as indoor meeting spaces built out of old shipping containers, where they can host events or facilitate training opportunities for young people. One such opportunity is an entrepreneurial incubation programme offered through a collaboration between the NGOs MakeSense and the Yunus Sports Hub (Agora Koumassi, 2021; make sense, 2021; Yunus Sports Hub, 2021). Again here, the sport offer is used as a hook to raise awareness and participation in the entrepreneurship programme. Overall, within this approach, assessment takes place through a mix of methods, including examinations, projects or presentations. Longitudinal surveys may also be used to evaluate certain attitudes or overall entrepreneurial intentions.

Though the attractiveness and simplicity of this approach are appealing, organisations may find it challenging to make the programmatic connection between the entrepreneurship and sport programmes. What connects the two programmes in terms of learning objectives/outcomes? How does one contribute to the other? If these questions are not appropriately resolved, the programme may not be perceived as credible, and numerous opportunities for synergies may be missed. At a minimum, such programmes must actively engage with the local start-up and business communities to ensure that the local entrepreneurship community supports their programmes and participants. Relatedly, sport-focused programmes that aim to launch an entrepreneurship component may not always have the required know-how or experience to design, or deliver, an entrepreneurship programme. New or emerging programmes, especially, need substantial input from educators,

entrepreneurs, industry leaders and sport personalities. Recruiting these resource persons could be time-consuming and difficult if access to the right networks is limited.

Finally, another challenge is ensuring that the sport programme maintains a development focus and not a “win-at-all-cost” mentality. Indeed, from an educational perspective, the added value of the sport programme would be diminished if it is used as a vector for unhealthy attitudes and behaviour.

2.2 Sport-Based Experiential Learning

This is one of the most widely used approaches in the field of sport for development. It focuses on integrating sport-based experiential learning activities designed to develop entrepreneurship skills. This approach reinforces the learning objectives of entrepreneurship education and can be easily integrated into an entrepreneurship education programme. It effectively develops transversal entrepreneurial skills and can help make the connection between those skills and entrepreneurship (i.e. during the discussion time of the activities). It also provides facilitators, teachers and social workers with a new and engaging teaching method.

This approach is used by many SFD NGOs and development organisations and agencies, such as the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (GIZ). Specific examples of sport for entrepreneurship curricula have been developed by the Swiss Academy for Development (Wespi et al., 2015), Kick for Trade (Fleming & Braun, 2020) or Standard Chartered (Standard Chartered, 2020). Thus, these activities often occur in humanitarian, development or NGO settings and actively seek to develop entrepreneurship-related attitudes and skills such as self-efficacy, ambiguity tolerance, proactiveness and interpersonal skills. These curricula generally rely on modified sport activities to deliver experiential learning through discussion, interactive or physical activities and reflection. For instance, the Kick for Trade manual divides each session into three parts. The first part features energisers to introduce the skill addressed by the session. The second part includes a football match that adopts specific rules or conditions that allow the development of the targeted skill (e.g. changing rules, number of players, size of the pitch, etc.). Finally, the last part is dedicated to reflections that allow participants to think about what was learned and how this connects to entrepreneurship in their communities (Fleming & Braun, 2020). Thus, these sport-based approaches provide the hands-on, group-oriented, reflection-driven learning approach often recommended in entrepreneurship education (Lackéus, 2014). As these programmes tend to focus primarily on attitudes and skills, however, assessment tends to be limited to longitudinal surveys or informal observations meant to measure changes in participants’ perceptions of their attitudes and skills.

As with the first approach, this approach is of particular interest to many organisations looking to complement existing methods and curricula. Indeed, this approach promises to prepare young people to integrate into the working world by developing

Table 2 Model for sport-based experiential learning approaches

Context	Humanitarian or development organisations or NGOs often in partnership with local NGOs, schools, national or local training institutes, universities, sport clubs and associations and educational or sport ministries
Objective(s)	To develop entrepreneurship attitudes and skills (e.g. time management, problem-solving, communication, motivation, etc.) through experiential sport-based learning. A secondary objective is to increase learner engagement by providing a physically stimulating teaching method (i.e. play-based learning)
Audience	Young people seeking informal or formal education who are also interested in sport or physical activity. This approach could also target young people who are no longer in the education system and who are not working or being trained for work (NEET)
Assessment	Assessment during the programme (e.g. number of participants, number of sessions, frequency of participation) Assessment immediately after the programme (e.g. surveys or observations)
Content	Sport for entrepreneurship skills activities, which, ideally, are integrated into an entrepreneurship education programme or training curriculum
Pedagogies	Experiential learning sport-based activities aimed at developing entrepreneurship skills. An essential aspect of this pedagogy is the discussion time at the end of each activity or session, without which this approach would be ineffective
Outcomes	Young people develop entrepreneurial skills that are relevant for any type of entrepreneurial activity (i.e. not only specific to the sport sector). They also receive the health, personal and social benefits of participating in sport-based sessions

their entrepreneurship attitudes and skills. This approach can also be implemented in collaboration with sport clubs and associations that are interested in promoting entrepreneurship skills and the employability of young people through sport. However, this requires a specialised curriculum as well as trained facilitators who are familiar with the SFD pedagogy and able to ensure that the activities make a meaningful contribution to developing entrepreneurial skills. This requires trained educators with an extensive repertoire of activities to ensure that the facilitators do not overuse the same activities.

Furthermore, many of these manuals or curricula emphasise a narrow set of attitudes, interpersonal and strategic skills like self-efficacy or perseverance (Fleming & Braun, 2020). Other core competencies associated with entrepreneurship education, such as marketing skills, resource skills or basic knowledge of accounting, finance and technology (i.e. declarative skills) (Kuckertz, 2013; Lackéus, 2014), are absent. As such, programmes delivering these sport-based learning approaches must also offer holistic entrepreneurial education opportunities that touch on the wide range of competencies required for successful entrepreneurship. Otherwise, the prospects of developing successful entrepreneurs will remain limited. Table 2 provides an overview of the model for sport-based experiential learning approaches.

2.3 Specialised Sport Entrepreneurship Education

The final approach seeks to provide specialised entrepreneurship training to future sport entrepreneurs. This approach targets youth, including NEETs or former sportspeople, who would like to seize the economic opportunities generated by the sport industry. Here, sport may be a hook insofar as the sport sector is attractive to many individuals, but unlike the first approach, the goal is to foster sector-specific entrepreneurship. For instance, entrepreneurs could initiate ventures around sport media, sport event management, personal training, talent identification and more.

The most significant benefit of this approach is that young people can seize the largely underexploited economic opportunities generated by the sport industry. This is especially relevant in the Global South, where the sport industry is undergoing massive transformation thanks to investments from governments, sport federations and former professional athletes. As noted above, many countries are increasingly focusing on sport as a vector for economic development (Moustakas & Işık, 2020; Putri & Moustakas, 2022). Likewise, many recent initiatives are attempting to capitalise on the entrepreneurship potential of athletes (FH Joanneum University of Applied Sciences, 2017; International Olympic Committee, 2021; TwIn, 2019). Tapping into this entrepreneurial potential may be especially important in countries with high youth unemployment and limited formal employment opportunities. However, to achieve this potential, sport entrepreneurship education programmes must help develop concrete business ideas and build a conducive environment to foster cooperation with and within the sport sector (Ratten & Jones, 2018).

A notable example of such a programme comes from TIBU in Morocco. Initially a basketball-focused NGO, the organisation has slowly integrated sport employability and entrepreneurship education into its programming over the last 5 years. Through a multifaceted programme that includes entrepreneurship workshops, practical sport experiences and networking with local sport sector actors, TIBU aims to (re)integrate Moroccan youth into the workforce via employment or entrepreneurial activities (TIBU, 2020; TIBU, 2021). Through this programme, participating youth obtain a 1-year scholarship to partake in courses on sport-specific topics such as coaching, sport business and sport policy and more general areas such as finance, communication and language. Prospective entrepreneurs emerging from this can then apply for the Sports Corners programme, whereby these young entrepreneurs can participate in a 6-month incubation programme and receive support from mentors (Orange Corners, 2022). Much like the first approach, assessments in this approach can take a variety of formats to match the individual content delivered.

However, offering relevant, specialised training for the sport sector can present significant challenges to organisations. In many emerging countries, the sport sector remains poorly mapped out, and many parts of the sector are underexploited. Thus, finding knowledge and relevant expertise in those areas may be challenging, and understanding market needs or gaps may be complex. Indeed, in countries such as Indonesia or Botswana, the sport industry remains poorly mapped out, and there is limited policy to support its growth (Moustakas & Işık, 2020; Putri & Moustakas,

Table 3 Model for specialised sport entrepreneurship approaches

Context	Vocational training institutes/schools/centres or specialised SFD NGOs
Objective(s)	To provide young entrepreneurs with specialised training in sectors connected to the sport industry (e.g. sport manufacturing, sport tourism, sport journalism, etc.)
Audience	Young people seeking informal or formal education who are interested in working in the sport industry. This approach could also target young people who are no longer in the education system and who are not working or being trained for work (NEET)
Assessment	Assessment during the programme (e.g. number of participants, number of sessions, frequency of participation) Assessment immediately after the programme (e.g. examinations, presentations, surveys)
Content	Specialised training curricula from sectors connected to the sport industry (e.g. sport manufacturing, sport tourism, sport journalism, etc.)
Pedagogies	Specific to the sectors to which the specialised training is connected. Internships and mentorships would enhance learner proficiency. Moreover, opportunities to develop and pitch entrepreneurial projects to industry leaders would better prepare learners for working in sport entrepreneurship
Outcomes	Young people are prepared and have the necessary qualifications (e.g. professional license) to work in the field of sport entrepreneurship

2022). Interestingly, the European Commission is conducting a study of sectors connected to the sport industry in Senegal in the context of the Youth Olympic Games (YOG) in Dakar (2026). The objective of this study is to understand better the sectors that are connected to the sport industry in Senegal and to evaluate how a sporting event, such as the YOG, could be used to stimulate those sectors. Studies such as this should be conducted to provide vital information regarding the status of the sport sector and connected industries. Table 3 provides an overview of the model for specialised sport entrepreneurship approaches.

3 Discussion and Future Directions

We have outlined what we see as the three main approaches for entrepreneurship education within sport. Sport is an attractive and growing sector that offers opportunities for both skill development and economic growth. As we have noted, there is a growing body of evidence that pedagogically adapted sport programmes can support the development of attitudes and skills related to success in entrepreneurial ventures (Lackéus, 2014; Williams et al., 2022). Likewise, we see that the sport industry is growing in many parts of the world and presents opportunities for economic diversification. Yet, these converging trends alone are not enough to guarantee the success of these entrepreneurship education approaches. Numerous areas require further development and research. Above, we have discussed the benefits and challenges associated with each approach. To conclude, we would

like to offer three final recommendations for the development of sport entrepreneurship education as a whole.

First and foremost, there is a need to disentangle employability promotion and entrepreneurship education. Many of the programmes or curricula we have mentioned mix both, and there is a real risk that this sidelines entrepreneurship or conflates it with employability. Especially in countries with large informal sectors or high youth unemployment, such as Tunisia, Jordan or South Africa (World Bank, 2021), entrepreneurship education may be a much more relevant and attractive offer. Clearly focusing on entrepreneurship would also allow programmes, especially those using the experiential learning approach, to more finely address the attitudes, skills and knowledge required for successful entrepreneurship. Indeed, whereas employability programmes may focus on specific qualifications, tools or professional skills, entrepreneurship education must instead develop a range of flexible and suitable competencies (Kuckertz, 2013; et al., 2008).

Second, there remains a glaring lack of research and assessment of entrepreneurship education in and through sport. Though there is some work, it focuses on sport entrepreneurship education within higher education (Ansari et al., 2020; González-Serrano et al., 2017) or related to sport employability programmes within SFD (Coalter et al., 2020; Spaaij et al., 2013). There is a need to explore the intersection between sport and entrepreneurship education in more detail both within and, especially, beyond the higher education context. Researching the impact of individual programmes and the overall approaches described here is paramount to fully understand the potential and limitations of sport within entrepreneurship education. In particular, most research or assessment occurs during or shortly after the programmes, and there remain significant gaps in exploring the sustainability of programme outcomes.

Finally, there is a need for a thorough understanding of the status and needs of the sport sector as well as opportunities within connected sectors. As highlighted above, such sectoral mapping has been identified as a critical step for numerous countries, including Senegal and Indonesia, and is essential to target entrepreneurship education programmes and develop relevant business ideas effectively. However, the value of such mapping extends to all of the approaches presented here. For parallel programming and sport-focused programmes, a greater understanding of the sector would allow practitioners to establish partnerships with companies that could enhance the effectiveness of their sport and sport entrepreneurship activities.

In the end, though, no matter the approach or geographic context, we strongly encourage programmes, researchers and funders to support regular participant engagement, offer follow-up support services and avoid short or one-time events. Entrepreneurship, like the broader processes behind development, is, after all, a lifelong endeavour.

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The Role of (Self-)Reflection in an Increasingly Digital Entrepreneurship Education Environment



Louisa Huxtable-Thomas and Taiga Brahm

Abstract (Self-)reflection is an increasingly utilised pedagogy in entrepreneurship education. This chapter conceptualises reflection as it pertains to education about, for and through entrepreneurship. It provides a review of the empirical literature, identifies some of the issues for student learning through reflection and introduces new perspectives on the role and requirements of the educator as they seek to create suitable environments for reflection – both for teaching and assessment.

Keywords Reflection · Entrepreneurship · Education · Teaching · Experiential learning

1 Introduction

(Self-)reflection is an important and often-used approach in entrepreneurship education (EE). It is specifically mentioned in the ‘EntreComp framework’ (Bacigalupo et al., 2016) and its accompanying practical guide, the EntreComp playbook (Bacigalupo et al., 2020), as one of the nine principles of EE. The significance of this framework is in its high rate of adoption across Europe and the UK as a standard for entrepreneurial competence. The authors emphasise the need to ‘fail, reflect and recover’, as a crucial step in the learning process. This latter role of reflection, as a type of metacognition, is well established in the paradigm of experiential learning (Kolb, 1984).

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As an educator you can put emphasis on reflection, by embedding iterative cycles of discovery, ideation and testing in the process but also by asking learners (individually or in groups) to reflect upon their learning experience. They can do it in writing or orally. When they perform such a self-reflection exercise, their learning outcomes become apparent, in turn contributing to increased self-efficacy, which is one of the EntreComp competences.

Entry from EntreComp playbook, (Bacigalupo et al., 2020, p. 17)

While reflection has been an often-discussed issue in the scientific discourse on management education (Reynolds, 1998, 1999; Cunliffe, 2004; Gray, 2007) and its importance for EE is emphasised (Bacigalupo et al., 2016; Kasseean et al., 2015), its conceptual basis, also in the light of increasing digitalisation, is not yet clear.

In this chapter, we will first conceptualise reflection with reference to different epistemic traditions, leading to distinct theoretical strands (for a review see Mann et al., 2009). Second, the barriers to reflection processes in EE will be discussed. In this regard, the role of educators in EE is also considered. Third, we will examine how digitalisation changes our conceptions of EE.

The goal of the chapter is to provide a sound theoretical and practical basis for incorporating reflection into EE which should enable readers to make informed decisions about their own practice.

2 The Role of Reflection Approaches in Entrepreneurship Education

Different epistemic traditions conceptualise reflection in distinct theoretical strands (for a review see Mann et al., 2009). For instance, several theoretical approaches have developed from Dewey's (1997) pragmatist philosophy. There, reflection is conceived as a mode of dealing with practical situations and is regarded as a cognitive process, i.e. a mode of thinking. Accordingly, when a practical problem, such as the founding of an enterprise, occurs, the entrepreneur's current observations are linked with theoretical knowledge and – if available – experience (Dewey, 1997). The pragmatist tradition of reflective thinking has been widely adopted by entrepreneurship scholars. Most prominently, Schön based his concept of 'reflective practice' (Schön, 1983) directly on Dewey (Schön, 1992).

In Schön's conceptualisation, *reflective practice* is about developing a specific way of approaching and solving practical problems. In this definition, 'practice' is the key element; Schön's concept was originally conceived as the cognitive link between problems encountered in exercise of a profession or activity, the scientific knowledge relevant for solving these problems and the mode(s) in which this knowledge can be applied. Accordingly, Schön's concept can be directly transferred

to the entrepreneurial process where it is crucial to apply scientific or theoretical knowledge not only to generate the idea for one's enterprise but also to apply management knowledge and skills to successfully found the start-up. In EE, the concept of reflection as a way to solve a problem is well established – reflection is a way of reasoning through complicated or complex situations, rather than simple or predictable ones for which a correct answer can be known (Van Beurden et al., 2013; Moon, 2001). Furthermore, when it comes to the more complex lifeworld of the entrepreneur, self-reflection is also a valid way of overcoming the emotional and resilience burdens of practical entrepreneurship which are often connected to intense emotions (Gallos, 2012; Huxtable-Thomas et al., 2016). The entrepreneur must often lead and be confident in their actions, relying on their own self-efficacy to deliver change, in an inherently novel and uncertain situation. Self-reflection provides an opportunity for learning from this process to prevent making the same mistake twice.

However, reflective practice is more than developing automatic routines and simply implementing theoretical concepts in complex situations. Instead, to become a truly reflective entrepreneur, it is necessary to cultivate a constant 'back and forth' between the current problem the founders of an enterprise are facing in practice, the emotional and cognitive reactions (including unconscious biases) that these stimulate and the abstract theories, models or concepts of entrepreneurship they act upon (Schön, 1992; Gibbs, 1988). Consequently, reflective entrepreneurs need to constantly (a) test their own assumptions about how practice works, (b) try to understand why certain processes or actions do or do not work and (c) analyse why their own theories and assumptions about entrepreneurial practice are (not) viable.

With reflection on action and reflection in action, Schön (1983) proposes two reflective modes that can also be applied to entrepreneurship (e.g. Lahn & Erikson, 2016): reflection on action looks at entrepreneurial processes in retrospect, encompasses an appraisal of how a situation has been handled and has an evaluative quality. In contrast, reflection in action takes place within the situation and during action. Reflection in action involves actively invoking experiences, feelings and assumptions during a situation as it unfolds in order to create new ways of understanding and interacting. This proactive form of reflection is fundamentally different from simply 'applying' professional theories and models. Applying a known concept or theory is usually a result of planned behaviour, based on anticipating an outcome and imagining the potential barriers to it. This simple application differs from reflection in action as the latter involves questioning and adapting the prior conceptual understanding *during the moment* of a particular entrepreneurial challenge. When undertaking reflection in action, the entrepreneur is neither dwelling on a past action nor planning a future one but instead utilising their knowledge of different theoretical lenses and past experiences to assess and appraise the entrepreneurial situation as it happens in order to decide how to act (Schön, 1992).

Accordingly, the reflective practitioner recognises an unexpected or surprising situation and tries to grasp it by referring to a *behavioural repertoire* of examples, situations and actions he or she has used before (reflection in action). However, Schön (1983) emphasises that many practical problems cannot be solved by only referring to the existing repertoire of actions but need a novel combination of

existing knowledge or the development of new problem solutions. Reflective practitioners, thus, possess strategies to enhance their repertoire to react adequately to such unexpected situations. This helps them to challenge assumptions and avoid mental fixations and cognitive biases that often lead to improper strategic decisions in business environments (Larrivee, 2008; Mahon & O'Neill, 2020).

It can be argued that both kinds of reflection are necessary to build and expand upon a person's behavioural repertoire: reflecting *in action* enables practitioners to realise when their actions are inadequate and when their behavioural repertoire is insufficient. *Reflection on action* takes place after an unexpected situation. It involves a careful and systematic analysis aiming at understanding why the person chose to act as he or she did, to evaluate this reaction and to develop strategies for similar upcoming situations. Thus, reflection on action adds insights and action strategies to the behavioural repertoire.

In sum, reflective practice is a *way of thinking*, i.e. a specific intellectual method or tool to avoid potentially harmful thinking such as cognitive biases (Thomas, 2018) or post hoc fallacies. It does not, however, propose a specific attitude or stance towards the object of reflection. Other approaches stress the *critical* element of reflection (Cunliffe, 2004; Athanassiou et al., 2003; Dehler, 2009; Heijltjes et al., 2014). In contrast to reflective practice, critical reflection explicitly aims to question current attitudes, perceptions and practices (Reynolds, 1998). Critical reflection has its roots in critical theory (Habermas, 1983), thus aiming to realise, understand and possibly change dominant power structures.

With regard to empirically measuring students' reflection, both reflective practices as well as critical reflection are ill-defined concepts (Kember et al., 2008). In particular, common concepts of reflection fail to identify discernible characteristics or indicators of reflection. For instance, for critical reflection, authors often refer to critical theory without further distinguishing the characteristics of such critical reflection process. If they become more concrete, the descriptions remain rather abstract with examples such as knowledge, power and reflexivity (Fook & Askeland, 2006). More concrete characteristics are necessary to distinguish reflective from less or non-reflective action and, ultimately, to operationalise it into observable measures. To develop a survey instrument measuring the quality of student reflection, Kember et al. (2000) combined the pragmatist tradition with the concept of critical reflection. This resulted in four reflection 'levels', which, in accordance with Mezirow (1991, 1997), are termed 'habitual action', 'understanding', 'reflection' and 'critical reflection' (Kember et al., 2000, p. 383–385). *Habitual action* refers to automated processes that happen without deliberate thinking. Called 'knowing in action' by Schön (1983), this often refers to much practiced routines, e.g. accounting procedures. *Understanding* is defined as an 'academic type of learning in which the student might reach an understanding of a concept without reflecting upon its significance in personal or practical situations' (Kember et al., 2000, p. 384). Understanding is regarded as pre-reflective as this level of thinking is rather idiosyncratic and not related to real-world circumstances. In practice, this behaviour occurs, e.g. when management principles such as shareholder value are applied without regarding its consequences for a firm's other stakeholders. *Reflection*

captures the core of Dewey's (1997) 'reflective thought' which defines reflection as an 'active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends' (Dewey, 1997, p. 6). In contrast to understanding, reflective thinking tests if a concept is valid and adequate for a concrete situation. Consequently, knowledge is not regarded as idiosyncratic but needs to be tested in real-world settings using logical reasoning. This may lead a person to change her/his 'point of view' (Mezirow, 1997, p. 5) regarding hitherto espoused concepts and practices. *Critical reflection* contains an element of deliberate scepticism and an intention to change current circumstances. The aim of critical reflection is to change a person's 'habits of mind' (Mezirow, 1997, p. 5), i.e. to question one's basic assumptions, norms and values. For example, in entrepreneurial contexts, critical reflection may be targeted at an entrepreneur's personal and business goals, balancing different kinds of values to be generated.

3 Why Is Reflection in Entrepreneurship Education So Difficult?

Reflection first appeared in the EE literature in the early twenty-first century. While it has not been possible to pinpoint the exact first use, the context is clear. The early 2000s saw a shift from the economic and theoretical view of EE towards a more pragmatic and applied view. This came at a time when work by Shepherd (2003) focussed on the emotional burdens of entrepreneurship; Hannon's (2005) work on the philosophical underpinnings of EE highlights the role of both reflection and the concepts of learning 'about, for or through' entrepreneurship; and Sarasvathy (2001) introduced effectuation. In general, the realm of EE was moving away from learning 'about' entrepreneurship as a theoretical endeavour to be planned and predicted, towards a more immersive process to be felt and experienced (learning 'through' entrepreneurship) (Kakouris & Liargovas, 2021). Hence, the need for reflection as a component in the nascent entrepreneur's toolkit was soon recognised. Initially identified as part of the 'radical' educational philosophy (Hannon, 2005), reflection soon became a standard expectation in EE (Bacigalupo et al., 2020; Kassean et al., 2015; Neck & Greene, 2011). While reflection on action may well be an effective cognitive process to learn from experiencing entrepreneurial failure as per the 'Kolb cycle' (Vince, 1998), the research that verifies this logic is still in the early stages. What has been published suggests that reflection usually occurs during the slow, creeping death of a firm, not in the 'fail fast' method that is advocated in higher education. In that context, individual or groups of learners are encouraged to start enterprises as fast as possible with the understanding that they will learn from their mistakes. Often, this comes with the expectation that the enterprise will not survive. Successful learning from failure has been observed as something that

happens in a team or dyad, rather than isolated to individual introspection (Shepherd et al., 2016; Cope, 2003).

Nevertheless, it is still rather unclear what supports and hinders reflection. We will discuss this question further by reviewing the empirical evidence regarding antecedents and challenges of students' reflection. Since literature on the particular challenges of reflection in EE is scarce, we include literature from other domains and transfer it to the domain of entrepreneurship.

Overall, evidence shows that students often do not meet the expected levels of reflective capabilities (Boud & Walker, 1998). While there are many suggestions about pedagogies which can foster student reflection, little is known about specific antecedents of different levels of reflection. In particular, we found hardly any research that explicitly distinguishes between different types of antecedents such as personal (e.g. cognitive capability, motivation, attitudes) and contextual (e.g. pedagogies, instructor characteristics) aspects.

As higher levels of reflection (in the sense of Kember et al., 2000) are positively correlated with students' learning outcomes (Peltier et al., 2005), it is important to find out what supports students to reach critical reflection. Both instructor-to-student interactions and student-to-student interactions are supportive if they encourage students to raise doubts about the subject matter, critique and discuss (Peltier et al., 2005).

Findings from other disciplines, primarily medical education, teacher education and social work, show that students tend to have misconceptions about the purpose of reflection. This negatively affects students' attitudes towards reflection (Beveridge et al., 2013). In educational contexts, it is also often unclear for students what expectations are related with reflection tasks (Dyment & O'Connell, 2010, 2011). This leads to superficial and impersonal reflection processes. In this context, it is also problematic when students consider reflection only as an academic exercise rather than a way of developing practice (Duke & Appleton, 2000). Some students have concerns about reflection because they involve their feelings. In the same vein, they have the impression that they are required to write and talk about things which they are unsure about (Platzer et al., 2000). Reflection under these conditions seems unprofessional and not academic to them, and this contradicts Bacigalupo et al.'s (2020) assertion that reflection enhances self-efficacy.

Additionally, a lack of trust in the lecturer hinders reflection (Dyment & O'Connell, 2010; Dyment & O'Connell, 2011). In this regard, it is also important to note that students whose reflection is assessed are driven to write to the assessment criteria rather than being honest or questioning their own thoughts and practices (Maloney et al., 2013).

In summary, students generally seem to be unsure what they are expected to do when they are supposed to reflect. Various studies found that uncertainty about reflection tasks results in negative emotions towards reflection. To tackle the challenge of developing students' capabilities for reflection, some studies tested pedagogies to enhance students' reflection. The most common interventions encompass reflective writing tasks, for instance, journaling (Cunliffe, 2004; Pavlovich et al.,

2009), case studies (Rendtorff, 2015) or guided internships (Schön, 1987; Carson & Fischer, 2006).

A further underlying issue that needs to be addressed is the lack of educator competence or purpose in teaching reflection. It might be assumed that educators should be able to teach reflection for two reasons: the first is that reflection is a useful tool in enhancing lifelong learning and criticality (Bharuthram, 2018), and several authors have written at length about how to teach reflection (Bharuthram, 2018; Ryan, 2012, 2013; Smith, 2011). Second, reflection is familiar to educators because it is widely used in teacher education (Moate et al., 2019; Clarà et al., 2019). In one conceptualisation, reflection is a way to uncover values and preconceptions, contrast them with an ‘ideal’ and develop new perspectives (Alsina & Mula, 2019). In another, reflection (on action) is a way of ‘ – evolving to a virtual simulated classroom, where reflection in action is used to respond to potential difficult learner behaviours’ (McGarr, 2021, p. 17). The conclusion that can be made from the wide range of research into reflection as a pedagogy for teacher education demonstrates that an educator’s experience of reflection is learned for a specific purpose. This purpose is to reflect on their own experiences in order to enhance their teaching practice. Therefore, it appears that while many educators learn through reflection, educators are rarely taught how to *teach reflection*, and as a result, they are often unaware of the ways in which reflection can be used to enhance learning in technical subjects outside of education. This subtle gap might explain issues identified above, such as reflection being assessed inadequately or reflection being used instead of similar but more suitable methods such as autobiographical analysis or participative observation.

Another challenge for educators is how and why to use reflection in assessment. On the one hand, it can be argued that the pedagogy of reflection requires constructive alignment (Biggs & Tang, 2015). This means that reflection needs to be matched by a learning outcome of ‘reflective skill’ and ‘improved practice or performance’. In consequences, this must be matched to an assessment on the quality of a learner’s reflection on their own practice. On the other hand, any attempt to assess the practice of others or the intention to utilise specific theory or knowledge is not suitably assessed through reflection but instead through other methods such as narrative inquiry or observation journals. This is not specific to EE but is certainly a challenge that entrepreneurship educators need to address: it is relatively easy to set reflection as an assignment in order to measure a learning outcome of entrepreneurial practice, but only if the marking criteria are related to the quality, depth and understanding of reflection in and on practice, rather than on the factors of success or failure of the entrepreneurial endeavour (as is often the case). This overcomes Maloney et al.’s (2013) issue of students failing to reflect because they are instead writing to address only the marking criteria. This is because constructively aligned assessment criteria for reflection must include honesty, questioning personal practice and noting routes to improvement (Biggs & Tang, 2015).

A further enhancement to the practice of reflection could be for lecturers to understand why reflection is a suitable method for teaching and/or assessment of entrepreneurship practice. As noted by Van Beveren et al. (2018), the reasons that

educators utilise (critical) reflection are diverse and sometimes contradictory. That research identified educators were using reflection to teach everything from personal awareness to aiding in social transformation as well as a critical tool with which to analyse received wisdom. This diversity suggests that reflection is a flexible tool but also that it is open to appropriation to support dominant professional or epistemological approaches. Within EE it has become a norm that is now rarely questioned.

To overcome this, an understanding of why reflection is being used to enhance teaching is needed. Reflection was first introduced to the education pedagogy as one of many stages in an experiential learning process (Steinaker & Bell, 1979) or cycle (Vince & Reynolds, 2009) based on the established cognitive theory of experiential learning. Reflection is a conscious and self-evaluative method of internalising and creating meaning from an experience and is followed by a process of dissemination or abstract conceptualisation. Therefore, the educational experience needs to be accompanied by these precursors (experiences) and subsequent actions or intentions. Further, as stated by Lynch et al. (2021), reflection is a way of overcoming cognitive overload among entrepreneurship students.

4 Implications for an Increasingly Digital Entrepreneurship Education

When looking into digital entrepreneurship education (EE), we need to first ask whether all forms of EE, i.e. teaching about, for and through entrepreneurship, are similarly feasible for digital teaching and learning. At first glance, one might argue that teaching about entrepreneurship is easily transferable to the digital world since we can easily transfer the rather teacher-centric mode of teaching *about* entrepreneurship (Lackéus, 2015). When looking into the characteristics of teaching *for* entrepreneurship, e.g. practical business tools, case studies, mentoring and on-site visits (e.g. (Kakouris & Liargovas, 2021)), transferring this part to an online mode of teaching seems to be more challenging. However, with the increase of improved options by simulation providers (Liguori & Winkler, 2020) and the potential of establishing regular small-group or 1:1 mentoring sessions online, teaching for entrepreneurship seems also possible online. So what about teaching *through* entrepreneurship? At first glance, this seems to be impossible to move online. However, there are at least two possibilities to rethink EE through entrepreneurship: first of all, business ideas are increasingly resulting from digitalisation processes (e.g. Finkle & Olsen, 2019), and the world of working is becoming more digital. Accordingly, founding an enterprise has for many entrepreneurs become a purely digital/online endeavour. Furthermore, if the business is not online, there is also the option to start the business offline and to accompany this process through digital education. This would result in a hybrid variant of teaching through entrepreneurship with the reflection of the knowledge and skills development to be moved online. This online aspect may afford learners the ‘arm’s length’ conditions that enable them to be

honest and deeply reflective, in a way that might overcome some of the issues of trust or self-confidence previously mentioned, as noted by Beveridge et al. (2013) and Peltier et al. (2005).

In this regard, the move to increasingly digital education also provides an opportunity to improve the practice and purpose of reflection. These come in three areas:

The first is because there are more accessible experiences to reflect upon through digital and virtual interaction. E-commerce and drop shipping provide opportunities for simple and low-cost introductions to entrepreneurship practice which were not possible previously. Second, the proliferation of digital tools and more apps, like Loopme.io and SimplyIdeas, which help structure reflections through the process of experience (Lackéus & Westerberg, n.d.), as well as more mainstream journaling and reflection apps like Reflect, Reflectly, InnerHour and Questions Diary, improve the familiarity and practice of reflection by providing guided templates for learners. The increased mainstreaming of virtual learning environments has provided an opportunity to utilise these tools in an authentic way which promotes lifelong reflective ‘practice’.

Last, online formats improve possibilities for collaboration and networking both among students and between students and educators. Providing this collaborative space for reflection not only affords an arm’s length ‘safe’ space for feedback from educators and peers on the depth and quality of their reflection but also promotes the practice of action learning (Byrne et al., 2016) itself a valuable workplace tool for entrepreneurs and leaders.

5 Conclusion and Recommendations for Practice

There is an acceptance in the academe that reflection can, and should, be practiced during the teaching process; both as a way of improving learning outcomes but also as a useful tool to aid [entrepreneurial] resilience later in life. The literature reviewed suggests that there is great potential for reflective practice in EE; today’s increasingly digital education environment provides a new context in which further research should investigate the supposition that entrepreneurship can be practiced more easily and with relatively few resources – through online retail, sales and services. In turn, digital tools have been created which allow assessment of the change in entrepreneurial mindset and practical skills, through the guided reflective practices available using different applications (see above).

However, the literature also confirms that the issues of introducing reflection to education as a whole have not yet been overcome. In part, this can be attributed to a lack of understanding about the conceptualisation of reflection itself as a way of ‘reasoning’ and coping with fast moving, complex decisions. Instead, reflection has been utilised as a ‘pedagogy’, a way of ‘teaching’ and promoting independent learning. It appears that the right tool is being used for the wrong purpose. This

can explain some of the issues faced by teachers and learners alike, such as, failing to include the emotional component in the reflection and its assessment.

The outcomes of empirical studies suggest that the methods and skills to operationalise good-quality reflection are used inconsistently among educators. The results can be poor attitudes towards reflection by learners, uncertainty about the purpose of the reflection in their learning journey and at the worst undermining confidence in the education process by promoting activities which appear unprofessional and non-academic.

Much of this can be ascribed to a lack of research or scholarly material about how to teach reflection. This results in a lack of appropriate training for educators. From our point of view, reflection is best taught by those that practice it themselves and that have been taught to teach it for the purpose that it is used. This is missing from much of formal education training. What is taught poorly is rarely assessed well, and so the issues appear to be further exacerbated when reflection is then set as a form of assessment. If the expected outcomes of reflection are not well understood, neither the teaching practice nor the assignment can be aligned to achieving it.

For increasingly digital EE to benefit from reflection, teachers will need to first assess their own assumptions and purposes for using it. As a result, they should set appropriate learning outcomes which recognise the value of reflection as a practice that enhances resilience and 'decisions in entrepreneurship'. This enables the recognition of learning, rather than a form of writing which enables an assessment of competence.

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Transformative Action and the Structure of Reflexivity: Aspects of Enterprise Teaching and Quality Pedagogy



Kingsley Obi Omeihe and Ibiyemi Omeihe

Abstract This chapter suggests that the key to quality entrepreneurship education lies in reflective action learning. In elaborating this perspective, this study draws on the reflective experiences of third-year entrepreneurship students and educators in providing interpretations of the learning and teaching process. The concept of transformative reflexivity, which presupposes an introspection of entrepreneurship teaching and learning methods located within social contexts, is introduced. At the centre, we contend that entrepreneurship education demands an approach to developing student and educator competence, with a rich emphasis on reflexive practice. This we believe creates a unique climate for quality experiential experience. Our main results facilitate a rich understanding of the positive effects of enabling greater student ownership of the learning process. The theoretical import of the study is in part a plea to solidify and interpret, in the face of scholarly differences, a unified stance that challenges and extends existing entrepreneurship knowledge within the limits of critical bounding assumptions.

Keywords Entrepreneurship education · Teaching · Transformative reflexivity · Learning

1 Introduction

To date, the view that entrepreneurship education should be based on experiential approaches continues to gain grounds. While there have been few attempts to examine the extent to which entrepreneurship education improves the quality of

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start-ups (Galloway & Brown, 2002; Wilson et al., 2009; Fayolle & Gailly, 2015), many of the questions which require propounding remain to be answered. In fact, tensions between the effectiveness of various entrepreneurship programmes and teaching delivery are perhaps the most widely posed concerns of the field (Gibbs, 2005; Kuratko, 2005). The problem of delivery, for example, invariably involves articulating new understandings, meanings and knowledge in a way that is co-generated from the interactions between faculty and students. The resulting effect, if effectively applied, influences graduate entrepreneurial proficiency. This remains critical as standard approaches to delivering entrepreneurship should be devoted to the identification of opportunities and the activity of setting up a business (Crammond et al., 2018; Omeihe & Omeihe, 2019).

Nonetheless, the practice of effectively teaching entrepreneurship is by no means an easy feat. While most entrepreneurship course have been criticised for their reliance on business plans (Mason & Arshed, 2013) and their detachment from the start-up process (Honig, 2004; Dutta et al., 2011), others contend that the over-reliance on theoretical underpinnings imported from other disciplines may have diminished the distinctiveness of entrepreneurship as a subject (Shane & Venkataraman, 2000; Solomon, 2008). To a large extent, an effective delivery requires an emphasis on scholarly considerations, such as entrepreneurial intent, opportunity recognition, start-up models and the economic importance of entrepreneurship. These are likely to stimulate entrepreneurship across students.

One of the virtues of putting right such concerns is making explicit the standards needed for quality entrepreneurship education. We are more concerned with the aspect that embraces experiential learning. Following Hasse and Lautenschlager and Lange et al., we recognise that the effectiveness of entrepreneurial learning lies in an experiential delivery approach (Haase & Lautenschläger, 2011; Lange et al., 2007). This remains critical as existing programmes have failed to develop the skill and entrepreneurial competencies needed in the fast-changing global market. Indeed, an approach in the right movement would be committed to addressing teaching effectiveness and delivery standards.

In this light, the purpose of this study is to present and discuss the findings from an experiential learning assignment towards evaluating the course effectiveness, as well as the approaches influencing teaching delivery. In seeking to identify best practice for teaching entrepreneurship education, the analysis of our findings is focused around one sub-question:

RQ1 *How do learners and educators perceive best practice in the delivery of entrepreneurship education?*

Compared to previous studies that have explored enterprise education as pedagogy (Jones & Iredale, 2010; Murray et al., 2018), our study recognises the relative paucity of research that have explored the role of experiential learning through the lens of both the learner and educator. Our findings reveal the essence of experiential approach to entrepreneurship education and, more interestingly, how it facilitates learning through reflective action.

Our main theoretical contribution confirms, first, that the logics of transformative reflexivity, which necessitates an understanding of behaviour located within social contexts, address the strengths and the equally active nature of making sense of reality. Secondly, we suggest that knowledge should ideally be grounded on a self-introspection, whereby uncertainties are suspended towards maintaining a positive expectation. From a methodological perspective, our study is useful in its application of a qualitative methodology, as it seeks to underscore the focus on critical issues by allowing a rich interpretation of our findings. This paves the way for an analysis of how learning experience is created and given meaning. We contend that the educator and learner's objectives can be best explained in terms of subject matter mastery and attainment of specific competencies (Mezirow, 1997). Hence, achieving these goals requires the critical reflection of one's own assumptions, while engaging effectively in introspection to validate beliefs through the experiences of others.

The remainder of this chapter describes transformative reflexivity and its embedded ties to experiential learning. We describe our findings and elaborate a framework that draws on students' reflections towards extending knowledge. Following an inductive approach, our method is explained before presenting our framework.

2 Logics of Transformative Reflexivity for Entrepreneurship Education

The delivery of effective entrepreneurship education demands creating an approach that encompasses student reflections. Following Lay and McGuire (Lay & McGuire, 2010), we believe that by introducing a reflexive standpoint in the way students learn, educators can devise pedagogical strategies that enable development of the critical skills needed to practice effectively. This, we recognise, has a strong impact on student learning.

So what is reflexivity exactly? Reflexivity involves probing thought processes, prejudices, assumptions and habitual actions, towards understanding one's complex roles in relation to others (Bolton, 2009). It differs from reflection which is an action of fixing one's thoughts on a particular subject. In reflection, one attempts to identify links from one experience to another. However, reflexivity suggests that one can locate oneself and appreciate how one's own self influences their actions. While both reflection and reflexivity are important for responsibility teaching practice, the idea of reflexivity is more complex as it facilitates the identification and modification of experiences towards shaping an enhanced action.

In a review of reflexive models, (Omeihe & Omeihe, 2019) provide an apt definition by suggesting that reflection is a process that enables a learner to embed understanding sourced through one's experience to accelerate choices as well as enhance one's effectiveness. Shaw offers the following suggestion: 'Reflexivity is a complex concept to understand and to teach'. She goes on to emphasise that reflexivity is about 'standing back and reflecting on experience...the ability to

initiate thoughts and action which involve imaginations, solutions for change' (Shaw, 2013).

Despite its potentials for positive outcomes, the concept of reflexivity has often been misunderstood (Okely & Callaway, 1992; England, 1994). The challenge stems from the absence of effective strategies designed to guide students in achieving learning outcomes. And as such, it becomes a difficult concept to apply in practice (Ash & Clayton, 2004). Concerned with the desire to connect student experiences to learning and a need to demonstrate a good application of their knowledge plus cognitive development, (Omeihe & Omeihe, 2019) introduced a new approach to reflexivity which posited the logics of transformation as defining the structure and meaning of reflexivity.

The focus of reflection was no longer devoted to students alone, rather it embraces the reflections of educators. For them, the logics of transformative reflexivity induce introspection on the path of the learner and educator by allowing a scrutiny of entrepreneurial learning and teaching approaches. Put succinctly, the logics of transformative reflexivity is an overall inclusive process which provides insights into quality teaching process (Omeihe & Omeihe, 2019). Embodied in entrepreneurship practice, its appeal lies in integrating teaching and student learning in a reinforcing manner. The emphasis is on the methods of entrepreneurial learning which probes the inner texture of adopted teaching practices.

According to their definition (Omeihe & Omeihe, 2019), the logics of transformative reflexivity provide a link between an enterprising content delivery and the constructed reflexive ability to stimulate student knowledge. It contends that entrepreneurship education for students needs to be experiential. This approach to reflexivity integrates the educators' introspections and that of the students as two necessary and complementary elements of transformative reflexivity.

While definitions of reflective learning vary in their emphasis, they all presuppose cognitive development for students to imagine in different ways, while developing alternative interpretations of their learning experiences. With transformative reflexivity, it requires going beyond student reflections and experiential learning, to embracing the introspection of the educators and the application of such reflections to practice. So located, together they regularise behaviour and provide an opportunity to assess the efficacy of entrepreneurship education.

3 Meta-theory of Logics of Transformative Reflexivity

The logics of transformative approach incorporate two underpinning meta-theories of how entrepreneurship education through introspection and experiential learning facilitates a richer application and understanding of the subject matter. Here, we articulate two guiding aspects that in our perspicacity underpin the meta-theories. This may provide well founded and valid insights for future theoretical refinement. We posit that transformative reflexivity should manifest at two different levels, that of the educator and the learner. These mutually reinforcing levels establish the

foundations for reflective activity, thereby enhancing the quality of teaching entrepreneurship and student learning.

3.1 Transformative Reflexivity at the Educator Level

Perhaps an important aspect of the transformative reflexivity approach is that the educator's role and competence are embedded within their introspection. Teaching delivery is an outcome of the reflexive standpoint in their thinking process. This is useful in enhancing their ability to devise pedagogical strategies that facilitate critical thinking on the part of the students. While most educators appear to rely on lectures and workshops to navigate complexities surrounding entrepreneurship courses, the effectiveness of delivery is determined by their ability to provide students with experiences that facilitate the integration of real-world experiences to their teaching content (Lay & McGuire, 2010; Zlotnik, 2003).

At this level of analysis, the transformative reflexive aspect exists on the part of the educator who provides the impetus for knowledge. A major characteristic of award-winning entrepreneurship educators lies in their desire to be reflexive after collecting feedback on their teaching approaches (Omeihe & Omeihe, 2019; Dunkin & Precians, 1992; Biggs & Tang, 2011). As the term reflexivity goes, it is a mirror through which one can make introspections and satisfactory outcomes. In relating this to effective entrepreneurship education delivery, the goal is to ensure that the perspective of the educator influences what is known and how it is known (Fook, 2002). This serves to determine the quality of graduate start-ups, as well as the intellectual attitudes of student entrepreneurs in the longer term (Galloway & Brown, 2002).

For transformative reflexivity, a series of articulated intellectual standard questions are posed at critical teaching periods to understand student learning and to know when knowledge has been imparted. It is expected that this will assist the educator in developing the skills, knowledge and ability that will foster the development of their intellectual capabilities.

Examples of the articulated standard questions which an educator may pose to define the breadth and depth of behind their teaching approach are as follows: 'What was good or bad about my teaching?' 'Was I able to convey the complexities about entrepreneurship to the students?' 'What could I have done better in stimulating entrepreneurship among the students?' 'How can I ensure that learning outcomes have been achieved?' 'Have I been able to transfer the knowledge and skills needed to operate a new business venture?'

For us, these series of reflexive questions present guiding blocks that provide the basis for improving entrepreneurship teaching delivery. It is because educators are required to challenge existing assumptions and to possess the ability to analyse power relationships in the classroom (Brookfield, 1995). This presupposes that the reflexive introspection demands that an educator's delivery must be aligned to achieve best learning outcomes. Put succinctly, an educator-level transformative

reflexivity provides a self-critical introspection of the teacher's strategic approach which induces new insights for improvement.

3.2 Transformative Reflexivity at the Learner's Level

A key assumption of the logics of transformative reflexivity is that entrepreneurial learning must be located in a way that stimulates entrepreneurship among learners. In broad terms, the key approach is centred on the need to enhance the learners' general attitude to entrepreneurship, as well as promoting entrepreneurship as a useful career prospect for students (Kolvereid & Moen, 1997). In explaining the learner-level transformative reflexivity, (Omeihe & Omeihe, 2019) argue that structures must be put in place to guide the way students reflect. This involves helping students connect their experiences by assessing the quality of learning. Thus, the underlying assumption is not on the quantity of reflective exercises; instead the focus is on how reflexivity challenges student's perspective of entrepreneurship, thereby providing richer explanations of their experiential learning.

Based on the work of Ash and Clayton, we contend that at the learner level, students should be guided in their reflexive process to exploring the interplay between theory and practice (Ash & Clayton, 2004). While we recognise that students vary not just in the study skills but in their approach to learning and particularly in the extent to which they reproduce material, the extent to which educators exert their guidance on the student's reflections is by amplifying the essence of learning objectives. As students identify with objectives, they effectively align their experiences in their journals. Through this, they can confidently identify the essence of varying learning entrepreneurial exercises.

In all of this and for transformative reflexivity to take place, emphasis must be placed on the learner's active reflection. Ensuring that students can actively think about what they are trying to do when it is applied is the cornerstone to student development (Gibbs, 2005). Examples of the articulated standard questions which educators can use in guiding student's transformative reflexive process are as follows: 'What did you learn?' 'How did you feel about it?' 'What do the objectives mean and why are they important? 'How is this useful is to your entrepreneurial development?' 'How does this contribute to your knowledge of start-up process?' 'How can you improve your chances of meeting your career goals?' Although similar to Kolb's experiential learning cycle and the articulated learning of Ash and Clayton (Kolb & Kolb, 1984; Ash & Clayton, 2004), these six questions are designed to address the issues of entrepreneurial intent and, therefore, are likely to influence graduate entrepreneurship. In essence, we contend that it is through the engagement of students' reflexive process and the outcome of their learning that real entrepreneurial progress is achieved.

4 Methods

4.1 Data

Because students and educators are active participants in the reflexive process, they provide a particularly good context in which to explore transformative reflexivity. We relied on data from an enterprise creation third-year cohort enrolled on the BA business programme at the University of the West of Scotland and a small sample of enterprise educators. Our first data source grew out of an analysis of a first semester assignment which had the keeping of a journal as a key component. Students were required to critically consider their personal development needs and skills. An integral part of the learning process was for them to be reflexive in their actions, as the assessment element requires each student to write about their own personal development. The journals had a 3,000-word requirement.

Our data collection strategy evolved matching our theoretical understanding (Glaser & Straus, 1967). Moving across the submitted assignments, we located 16 submissions that fit our emerging definition of transformative reflexivity and proceeded to dedicate special attention to them. As our understanding of transformative reflexivity grew, we decided to increase our knowledge of learners who were not engaged in the reflexive process, and we included for a deeper study 2 submissions to our existing 16 samples.

Our second source of data collection consists of case studies initiated between 2019 and 2021 to investigate the contemporary phenomenon which exists between learners and educators. In explicating this, our choice of using a qualitative case study approach was to retain the holistic and meaningful characteristics of real-life narratives using multiple sources of evidence pertaining to reflexive processes of learners and educators.

In essence the case study was used to complement the first data study. This enabled a much deeper understanding of how transformative reflexivity looks from the perspective of educators and learners being studied. Therefore, the cases allowed a range of similarities and contrasts and thereby added confidence to the findings of the study (Miles and Huberman, 1994; Yin, 2014, p. 45).

The comparison of different cases provided for clearer conclusions in explaining the concept of transformative reflexivity. The point being that it is expedient to uncover how educators also make sense of their reflexive practice from a particular vantage point.

We began by approaching enterprise educators, and we relied on a purposive sampling, beginning with educators who had taught on the course and proceeded to invite those who had taught on other venture creation courses. The choice of adopting a purposive sampling fits perfectly within the frame of this study, as the logic behind our strategy for selecting cases was dependent on the needs of our emerging theory (Marshall & Rossman, 2014). Much of what we learned came from a comparison of findings from both data sources. For our interviews, the conversations were not recorded. So, our quotes in this study are a product of written notes

Table 1 Characteristics of educators

Case details	Courses	Expertise and role	No of interviews	Location	Gender
Case A	Enterprise creation, new venture development, entrepreneurial opportunities	Enterprise educator	1	Scotland	Male
Case B	Enterprise creation, creativity enterprise and innovation	Enterprise educator	1	Scotland	Female
Case C	New venture development and enterprise creation	Enterprise educator	1	Scotland	Female
Case D	Enterprise creation and new venture development	Enterprise educator	2	Scotland	Male
Case E	Creativity enterprise and entrepreneurship, enterprise Creation, new venture creation, enterprise and creative media	Enterprise educator	3	Scotland	Female
Case F	Enterprise creation and leading change	Enterprise educator	2	Scotland	Male
Case G	Leading change and entrepreneurial leadership	Enterprise educator	3	Scotland	Male

captured during the interviews. Table 1 provides an overview of the characteristics of the educators and Table 2 an overview of the characteristics of learners.

4.2 Analysis and Data Procedure

In examining learners and educator's experiences about transformative reflexivity, we made effort to adopt the best approaches for data analysis. We structured our analysis according to established procedures for thematic analysis (Braun & Clarke, 2006). Our analysis was done at two levels. First, we focused on identifying reflexive descriptions from the students' reflective diaries. We then examined the case studies of educators comparatively and coded the responses based on a series of simple typologies that emerged (Miles & Huberman, 1994; Baker & Nelson, 2005). An important aspect of the coding process involved the domains where the educators engaged in the reflexive process, supported by the coding from the students' journals. Part of this process involved a within-case and cross-case synthesis of the evidence, as quotes were used to build evidence for the readership.

Following an iterative process, we were able to refine the themes before proceeding to undertake a second-order audit. We then compared the overall reflexive experience towards developing an overall reflexive narrative. This was useful in ensuring that the data collected was indicative of the true responses of the participants. The analysis focused more on the similarities rather than the differences across our findings. To a broader extent, this provided an opportunity for rich and valid data to support this study.

Table 2 Characteristics of learners

No	Course	Male	Average class size	Demographic	Year of study	Location
16 students engaged in the reflexive process	Enterprise creation	8	8	10 UK students, 6 international students	3rd year	2018–2019 Scotland
2 students not engaged in the reflexive process	Enterprise s creation	1	1	1 UK students, 1 international students	3rd year	2018–2019 Scotland

In presenting our results, we have relied on quotes from the interviews and selected examples from the journals to describe our findings. For our selected examples, we have chosen alphabets to introduce the educators involved and relied on indexed numbers for the learners.

5 Findings

Our qualitative data indicate that the standard reflexive questions were useful in capturing outcomes and opportunities relevant for the application of entrepreneurial knowledge. The structured questioning process provided an opportunity for both learners and educator to achieve a rich level of critical reflexivity (Ash & Clayton, 2004).

5.1 *Entrepreneurial Awareness*

From our empirical findings, there is evidence from the journals that the educators' approach to teaching provided a rich sense of entrepreneurial awareness. We tried to evaluate the efficacy of this observation and identified this was a product of the educators' ability to be reflexive on two of the standard questions: 'was I able to convey the complexities about entrepreneurship to the students?' and 'what could I have done better in stimulating entrepreneurship among the students?'. Some of the below excerpts captured in the student's journal are presented below:

Due to this course, I now have an overview of what it is to create a business. It has motivated me to create my own business. Now I know the work that is behind every business creation (Learner One)

This module was really useful for me. Indeed, I may be creating my own business sooner than expected and having courses on it will help me (Learner Two)

I have been able to develop new skills and attributes thanks to this module. I feel I am now able to run my own business. It was a concrete module that permits us to familiarise with the business world (Learner Three)

Indeed, it seems relevant that a fundamental element of transformative reflexivity is the educator's need to recognise their individual teaching approach as a basis for the development of entrepreneurial teaching and learning strategy. Table 3 captures a range of selected feedback to buttress our findings.

Table 3 Illustrative reflective quotes demonstrating entrepreneurial awareness achieved from the course

Learner 6	'I have learnt what is involved in creating a business idea and I intend to use the knowledge and skills to progress in the future'
Learner 8	'Now, I know all the steps and actions necessary to create a business, this includes the various means of financing a business. I also know how to interpret data of a market study to validate a project'
Learner 9	'The module gave me ideas for my future in the business world. It is important for students to become aware of all the elements and areas surrounding a new venture. I now understand the importance of finance and marketing for a new start-up'
Learner 3	'I learned that there is so much more that goes behind the scenes when starting a business than I first imaged. And so much thought and preparation have to go in before a concept can be brought to life'
Learner 5	'I learned the importance of gradually growing a business and to try start off small and build up to bigger things'
Learner 4	'Indeed, in this module I have learnt the essentials of a business which will be useful to me for my professional years'
Learner 10	'I now have a better understanding of what an investor will look for when pitching a product or idea in a business environment'
Learner 11	'I have been able to develop my understanding of the business industry. This will help propel me further towards my career goal'

5.2 Learning Outcomes

One of the principal arguments advanced in this study is the achievement of entrepreneurial learning outcomes. The objective of learning outcomes across entrepreneurial courses is broadly the same: which is to encourage students to be more entrepreneurial. A key aspect of the transformative reflexivity process is a simple question that captures how an educator's understanding of the learning outcomes is captured in the reflective process: 'how can I ensure that learning outcomes have been achieved?'. This in turn is used as a guide to improving new teaching experiences. The following excerpts captures selected responses from the educators:

In my teaching, I am always conscious of what student should know, so I that don't deviate in my explanation. This includes the skills and knowledge which should be acquired at the end of the class, course, and assessment. This is useful in ensuring that students understand why knowledge and skill is useful to their entrepreneurial capacity. (Case E)

I am careful about the topics to teach so that I can ensure an understanding that provides entrepreneurial coverage. Relevant topics are prioritised to ensure student understanding. (Case C)

Table 4 portrays more findings from the educators' and learners' interpretations of learning outcomes. Our method for summarising the relationship between our qualitative evidence builds on Sutton and Callahan (Omeihe, 2019) cross-site analysis developed by Miles and Hubermann (1994) for identifying similarities among data. The cross-site display in Table 4 was constructed to indicate evidence from their reflexive response. Here we have gone ahead to capture a combination of

Table 4 Cross-site display of evidence demonstrating reflection of entrepreneurial learning outcomes (ELO)

Respondents	Assessment task requires student perform intended outcome	Effort to capture entrepreneurial learning outcomes during teaching	Ensure students are engaged in learning activities required in the entrepreneurial learning outcomes	Shifting the focus from educator to learner	Define what entrepreneurial learning outcomes students are meant to achieve	Notes on fit between data
Learner 17	r C	r c	r c	r C	r c	Weak fit
Case F	R C	r c	r c	R C	r c	Fair fit
Learner 4	R C	r c	r c	R C	r c	Good fit
Case F	R C	R C	R C	R R	R C	Excellent fit
Learner 5	R C	R C	R C	R R	R C	
Case G	c R	C R	c R	R C	C R	
Learner 6	R C	R C	R C	R C	R C	

*C strong evidence interviews, c modest evidence from interviews, R strong evidence from reflective journal, r modest evidence from reflective journal

evidence that projects a good fit in teaching and learning approaches. This evidence is elaborated below.

5.3 Personal Development

Becoming an entrepreneur requires a time of rapid development. Good entrepreneurship courses have an orientation to support the development of students. This is supported by a careful creation of peer learning communities, mentoring and a good teaching delivery. Evidence from the students' reflections indicated that the course was useful to their personal development. All the 16 students including the two students who had not engaged fully in the process reported that they had enhanced their personal development. Some of the key entrepreneurial development themes that emerged were confidence, application of new knowledge, creative and innovative skills and entrepreneurial intent and capacity. For the educators, a majority identified that students were always interested in challenges and had to be stimulated. Hence, students were recognised as fully engaged in the course delivery only if there is a vehicle for change and personal development. Table 5 provides an overview of illustrative quotes for personal development.

Table 5 Illustrative quotes for personal development

Learner	Reflective quote	Personal development skills
Learner 4	Completing this course has made me realise how much progress I have made when it comes to presenting. And how much I have improved when it comes to being innovative and creative. It has also taught me to become more confident in myself	Confidence, presentation, innovative and creative skills
Learner 5	I have learnt to be more confident. I have come to learn to believe in myself	Self-confidence
Learner 6	This course also allowed me to learn and apply new knowledge to start a business	Entrepreneurial knowledge and capacity
Learner 11	Throughout this module, I feel I have shown a variety of skills and knowledge. I also feel I have demonstrated my entrepreneurial attributes	Entrepreneurial knowledge
Learner 13	I have grown to be a creative individual and I feel the business idea reflects this by being innovative	Creative and innovative skills
Learner 17	Throughout the process I learned that time management skills are important and are tested throughout module. And therefore, I would have benefitted from filling the reflective journal week by week as I missed it some weeks	Time management and organisational skills
Learner 18	I learned that keeping a journal allows you develop goal setting skills, which have not been my strength. I learned that by filling in a journal week by week allow you to properly think about how you felt in certain topics	Organisational skills

5.4 *Educators' Perspective*

From our empirical findings, there is evidence that entrepreneurship education is enhanced by a transformative reflexive process through which educators can critically analyse their approaches. In this vein, a reflect-evaluate-restrategise approach is undertaken to improve teaching and student engagement. This involves changing key aspects of teaching styles in a systematic way by drawing from evidence available to the teacher. A typical excerpt is provided by one of the respondents:

Teaching for me is a passion, however students seem not to enjoy my teaching. I tend to notice this through their levels of engagement, and this is not satisfying. I always go back home and try to be better the next day. I try to engage them more and try to seek their attention. It works most times for me, but I know I need more application (Case E)

The above evidence involves a self-induced reflexivity which enables the teacher to critically review aspects of one's teaching. This ensures that such action supports the adjustment of teaching approaches through self-monitoring. The respondent refers to a reflexive cycle which aims at improving teaching approaches. Although much can be achieved through reflexivity, the empirical findings further point to the need for suitable learning activities which will shape the entrepreneurial mindset of the students.

When asked about the suitability of the intended learning outcomes, one of the respondents provided the below excerpt:

It is always important to go back to the drawing board. My approach is to ensure that I achieve the learning outcomes through my teaching approach. This includes providing unique learning activities to stimulate student development. (Case C)

Interestingly, the transformative reflexive process enhances the pedagogical message transmitted to the student. Here the educator ensures that tasks and activities are designed to support the development of student entrepreneurship. Crucially and within the students' journals, we found that a major barrier to entrepreneurship teaching was a proficiency in this area. One of the respondents implied that proficiency was not only related to theory but also with the ability to have educators who have run their own businesses.

Quality entrepreneurship education was identified as ensuring student engagement, providing mentorship and stimulating the cognitive process of the students. Teaching delivery was essential, but more importantly, there is a need to stimulate class tasks and assessments. This should be based on real-life projects and evaluated by real entrepreneurs.

A typical excerpt indicated the role of group assessments and projects:

To bring the best from students with regards to entrepreneurship, demands good assessments and tasks. This should be based on real life projects and must be demanding in capturing key concepts of the business formation. Traditional individual class work and assessments are not enough. (Case D)

The above excerpt indicates the need for relevant assessments and class activities that provide support for improvement. Through this approach, students are tasked

with taking ownership and control of their learning. Here, the obstacles faced while learning are confirmed as the educator is expected to keep track of teaching shortcomings with strategies for improvement.

6 Logics of Transformative Reflexivity Model

Based on the foregoing, our five-stage model (Figs. 1 and 2) existing at both levels (educator and learner) demonstrates how entrepreneurship teaching and learning are translated into reflections to serve as a guide for enhancing new experiences. As the model's title indicates, the logics of transformative reflexivity affirm the essence of reflective introspections as a basis for new entrepreneurship teaching and learning action and an evaluation of the consequences.

7 Discussion and Conclusion

This chapter has examined the experiences of educators and students as it relates to the structure of reflexivity. It is precisely the feature of transformative action that would explain how quality teaching can be imparted. While admitting its relevance,

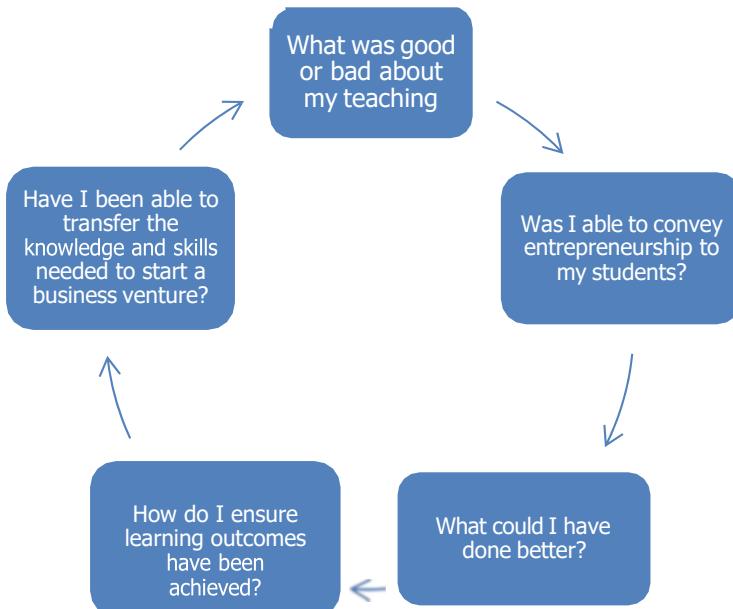


Fig. 1 Educator-level transformative reflexivity

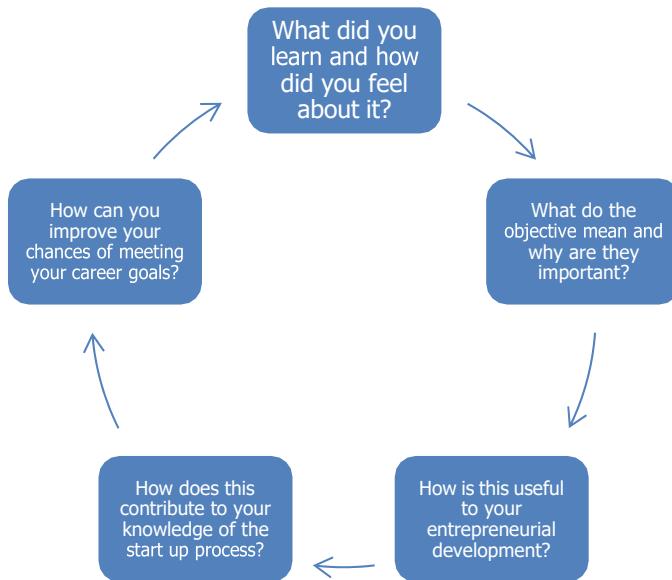


Fig. 2 Learner-level transformative reflexivity

the chapter has contended that effective entrepreneurship education cannot fully stand out without an introspection of teaching and learning approaches.

In addressing entrepreneurship teaching approaches (research question one), the educators' excerpts support an enacted transformative introspective approach to teaching and learning. As a matter of fact, the argument to be made in maximising opportunities indicates that the educator's reflections should be shaped around a series of standardised questions that include firm commitments to enhancing teaching delivery.

Evidence seems to suggest that for this is to be possible, an appropriate set of learning activities should be in place to shape students' entrepreneurial mindset. Indeed, evidence across the responses embraces the need for personal development and mentorship.

It must be pointed out that our findings were not dedicated to educators alone but learners inclusive. As is evident, one fact that needs to be given recognition is that intervention aimed at improving student learning is required. For example, students need to be guided along a set of structured reflexive process to create opportunities for learning enhancements. As a result, we have argued that capturing learning experiences supports the entrepreneurial process (Crammond et al., 2018; Murray et al., 2018), such that it emboldens students to take control of their learning. Indeed, the challenges on the part of the educator demand the need to recognise their teaching shortcomings, in the view of undertaking strategic improvements.

From a broader perspective, the potential usefulness of quantitative data would have limited the findings derived in this study. We recognise that using quantitative methods may not provide a rich understanding of the issues we seek to uncover.

Unlike qualitative approaches that bring us closer to the research phenomenon, quantitative approaches are known to provide causal explanations and numerical measurements (Bryman & Bell, 2015; Omeihe, 2019). Thus, a qualitative study was considered applicable as it provided a rich understanding of transformative reflexivity in entrepreneurship education.

It's apparent that a potential weakness of our data may have to do with the sample size. It remains the case that plausible future studies could consider cross-institutional comparisons which include leaders of higher education.

To say that our contribution provides insights into approaches for enhancing quality entrepreneurial teaching and learning is not enough. We contend that entrepreneurship education demands creating a unique climate which encompasses holistic educators' and learners' reflexive practices. We believe this has a strong impact on entrepreneurship education.

In short, while some may see limitations to entrepreneurial learning from a student perspective, we argue that success expectation lies at the doorstep of the curriculum/programme design and approach. This presupposes an application of a set of introspections which educators must adhere to.

Ultimately, universities should seek to address the associated interventions needed to create an entrepreneurial culture. As such, the appeal of this study lies in the opportunity to probe the inner texture of adopted teaching and learning practices. Our chapter points that effective entrepreneurship education should incorporate transformative reflexivity for both educators and learners by allowing a scrutiny of their teaching and learning process.

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The Impact Circle: A New Design-Based Method for Developing Business Opportunities with Sustainable Impact



Marc Karahan and Caro Noemi Stoeckermann

Abstract In sustainable entrepreneurship education (SEE), participants frequently take on the role of would-be entrepreneurs and develop business ideas that contribute to sustainable development. Due to the complexity of entrepreneurial tasks, educators require adequate tools and methods that facilitate the participants' learning. However, methods for sustainable entrepreneurship are generally scarce, and most existing approaches are either ill-suited for the educational context or encourage users to add new sustainability features to business ideas rather than challenging underlying value creation mechanisms. Hence, a new approach is needed to emphasize sustainability at the center of business model innovation while being suitable for SEE. Based on Koestler's concept of bisociation, which implies joining seemingly unrelated or conflicting information from different domains, we developed a new method for discovering sustainable business ideas—the Impact Circle. The 2-year development process comprised 8 workshops with 164 participants and multiple scientific methods. We contribute to research and practice by outlining the iterative development process and describing the Impact Circle's application. Furthermore, we provide novel insights into bisociation as a phenomenon in entrepreneurial cognition and creativity.

Keywords Sustainable entrepreneurship · Education · Method · Teaching

1 Introduction

In response to the sustainability crisis and driven by student demand, many higher education institutions have implemented sustainability elements into their teaching and training activities to educate participants as responsible future professionals and

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change agents for sustainable development (Karahan et al., 2022; Lozano et al., 2013). Specifically, entrepreneurship education has seen a recent surge in social or sustainable entrepreneurship offerings. Sustainable entrepreneurship education (SEE) provides participants with skills, knowledge, and attitudes to assess and exploit business opportunities concerning environmental and social needs (Sharma et al., 2020). Among the most popular SEE teaching approaches is experiential learning, in which participants are guided through the entrepreneurial journey, essentially placing them in the position of would-be entrepreneurs (Mindt & Rieckmann, 2017). Given the complexity of the tasks that (would-be) sustainable entrepreneurs need to perform, educators require adequate tools and methods to support the learning experience and to ensure knowledge uptake.

However, most of the current tools for sustainable entrepreneurship (for an overview, see (Hope, 2018)) are either ill-suited to the educational context or detrimental to its overall purpose. On the one hand, they tend to be inherently complex, and their application thus requires extensive guidance (Geissdoerfer, 2019), which is constrained by the limited time and personnel resources of SEE. On the other hand, even if current tools are accustomed to the SEE context, they often neglect a direct contribution to sustainable entrepreneurship competencies (Lans et al., 2014; Ploum et al., 2018). For instance, (Bocken et al., 2013; Geissdoerfer et al., 2016) suggested a comprehensive value mapping tool. By assessing the positive and negative impacts of venturing activities on diverse stakeholders, it enables users to generate novel ideas for mitigating or leveraging these effects and advancing the underlying business model. However, while the value mapping tool provides a systematic and convenient approach for sustainable business model (SBM) innovation, it neglects to foster sustainable thinking throughout the entire application. Notably, during the idea generation, the tool's current design nudges users to add new elements to the underlying business model instead of reflecting the value creation logic. Business sustainability, hence, becomes a mere “saddlebag or bolt-on” (Sharma & Hardt, 2014; Wyness & Jones, 2019). This *additive bias* is persistent among various SEE tools and sustainable entrepreneurship in general (Sharma et al., 2020). In this regard, (Dean & McMullen, 2007) criticizes “sustainability-orientation in the development of a new business model is not a matter of simply adding new sustainability components and questions to merely profit-oriented business model frameworks.” To effectively facilitate sustainable entrepreneurship, SEE must overcome the dominant additive approach.

We address this gap by developing a new method that (1) enables entrepreneurs to assess the impacts of business models and (2) comprehensively supports the discovery of more integrated, sustainable business ideas, while (3) being suitable to the SEE context. Hence, we ask the following research question: *How can we assist entrepreneurs in considering sustainability as an integrated concept in business model innovation?* The resulting method, called the Impact Circle, was developed based on a 2-year iterative design process including multiple scientific methods, such as interviews, surveys, observations, and expert feedback. We continuously applied the Impact Circle in 8 workshops with 164 participants from various backgrounds.

2 Theoretical Foundations

2.1 SBM as a Theoretical Lens for Sustainable Entrepreneurial Impacts

SBM theory offers a valuable theoretical perspective for understanding entrepreneurial contributions to sustainable development. It dissects business impacts as multidirectional value creation logic for diverse stakeholders (Freudenreich et al., 2019). On the one hand, SBM theory describes what stakeholders are relevant in the sustainable entrepreneurship. These include financial stakeholders, customers, business partners, employees, and societal stakeholders (Freudenreich et al., 2019). In addition, (Bocken et al., 2014) emphasizes the role of the natural environment by suggesting them as a separate stakeholder category. On the other hand, SBM theory analyzes how those stakeholders relate to entrepreneurial activities. According to (Freudenreich et al., 2019), stakeholders and start-ups engage in reciprocal relationships, such as production and consumption of goods and services, supply and co-creation, and contribution to sustainable issues and appreciation of related activities. In conclusion, the SBM theoretical lens suggests that educators enable the discovery and design of sustainable business ideas by facilitating a broad stakeholder identification and an assessment of the relationship between entrepreneurial activities and stakeholder consequences.

2.2 Conflicting Stakeholder Interests as Sustainable Entrepreneurial Opportunities

Stakeholder theory amplifies the suggestions of SBM theory. Accordingly, it views business processes as “how customers, suppliers, employees, financiers [...], communities and managers interact and create value” (Edward Freeman, 2010). In capitalism, it is the entrepreneur’s duty to manage and shape the relationships between stakeholders so that all win in the long run (Edward Freeman, 2010). This often proves challenging in reality. In sustainable entrepreneurship, founders frequently need to balance conflicting demands between stakeholders, e.g., building a new production facility versus protecting the local forest or improving data algorithms versus ensuring data protection (Freudenreich et al., 2019). It is the nature of entrepreneurship to respond to this dissonance with creative problem-solving rather than a trade-off mindset. To put it differently, if entrepreneurs “look for trade-offs among stakeholders, then they will create trade-offs, and they may never find the ‘sweet spot’ that signifies the joint interest of all key stakeholders” (Edward Freeman, 2010). Therefore, conflicting stakeholder interests may yet entail another entrepreneurial opportunity. Thus, educators may enrich stakeholder identification and relational assessment by leveraging the entrepreneur’s creative problem-

solving ability to develop novel solutions that address conflicting stakeholder demands.

2.3 Generating Sustainable Entrepreneurial Ideas through Bisociation

Creativity, defined as the production of novel and useful ideas, is a profound characteristic of entrepreneurs (Hennessey & Amabile, 2010). According to (Weinberger et al., 2018), “the nature of entrepreneurs’ jobs means that their business’s success depends on the entrepreneur’s capacity to generate creative ideas not merely occasionally, but on a daily basis.” When exploring and exploiting entrepreneurial opportunities, they engage in a continuous iterative process of idea generation, refinement, and redevelopment (Dimov, 2007). Entrepreneurs combine information from multiple unrelated domains to generate original ideas during this process. Particularly, the diversity of information is a strong moderator during idea generation (Gielnik et al., 2012). We argue that various stakeholder interests, as described above, constitute such diverse information. Compared to traditional entrepreneurship, sustainable entrepreneurship not only involves industry or business information but extends to social and environmental considerations (Dean & McMullen, 2007). Idea generation thus includes highly heterogeneous information domains, making sustainable entrepreneurship a fertile ground for entrepreneurial creativity.

However, the exposure to diverse information, i.e., conflicting stakeholder interests, does not readily translate into sustainable business ideas. Therefore, it is necessary to position relevant information at the center of the entrepreneur’s idea generation. We argue that if business ideas resolve conflicting stakeholder interests, they integrate diverse values and hence may be considered more sustainable. To identify such ideas in the SEE context, we draw on the concept of bisociation (Koestler, 1964), which has attracted some scholarly attention in entrepreneurship, creativity, and education research (Pettersen et al., 2019). Bisociation implies joining seemingly unrelated or conflicting information from different domains. It facilitates “the mixture of concepts from two contexts or categories of objects that are unconnected by the normal processes of the mind” (Pettersen et al., 2019). As opposed to associative thinking, which is more common in everyday life decisions and arguably the additive approach in tools for sustainable entrepreneurship, in bisociation, “individuals *combine* information to identify an opportunity or to help shape competitive advantages” (Ireland et al., 2003). For instance, (Koestler, 1964) uses the invention of the printing press as a historic illustration for bisociation. The author described how Gutenberg combined observations on the coin punching process (domain A) and the application of steady pressure during the wine harvest (domain B) to invent the process of printing with movable types. Concluding, by

applying the concept of bisociation to sustainable entrepreneurial tasks, we propose a positive contribution to identifying sustainable business opportunities.

2.4 *The Need for a New Method*

SEE practitioners are responsible for equipping (would-be) entrepreneurs with hands-on tools for developing sustainable business ideas (Pettersen et al., 2019). Albeit creative ideas require consecutive action to be considered entrepreneurial opportunities, they are nevertheless an integral part of the entrepreneurial journey and thus an essential element of SEE. Given the absence of adequate tools, educators need a method that facilitates entrepreneurial creativity for exploring novel value-integrating solutions that meet conflicting stakeholder interests.

3 Methodology

Our research methodology was based on six stages displayed in Fig. 1 and comprised various qualitative and quantitative scientific methods. Its overall strategy and approach to results reporting were inspired by (Geissdoerfer et al., 2016).

Following our research question, in stage 1, we first defined the requirements for tools in the SEE context. We focused on three types of data, (1) recent scientific publications on SEE and SBM, (2) interviews with three SEE practitioners, and (3) our own experiences as lectures and designers for sustainable entrepreneurship formats. Subsequently, we analyzed to what extent existing tools fulfill the requirements. First, we performed a keyword-guided desktop research in scientific and public databases and manually reviewed the websites of relevant institutions to identify current tools for sustainable entrepreneurship. Second, the research team rated the identified tools according to the predefined requirements and discussed the results until a consensus was reached.

Informed by recent insights on sustainable business model innovation (e.g., Breuer et al., 2018), we collaborated with two design experts to develop the first Impact Circle prototype in stage 2. Both have more than 10 years of professional experience in developing design-based tools, and one holds a PhD in design sciences. Upon development, we then tested the Impact Circle's main components and functionalities iteratively with several students as representative users. We observed how they used the Impact Circle and interviewed them about their experience. Based on these insights, we revised the prototype.

In stage 3, two student teams applied the prototype as a homework exercise during a sustainable entrepreneurship seminar at the Technische Universität Berlin. They used the Impact Circle to reflect the impacts of a previously developed business opportunity and subsequently ideated sustainable business ideas. We evaluated the method's effectiveness and general user experience using surveys and participant

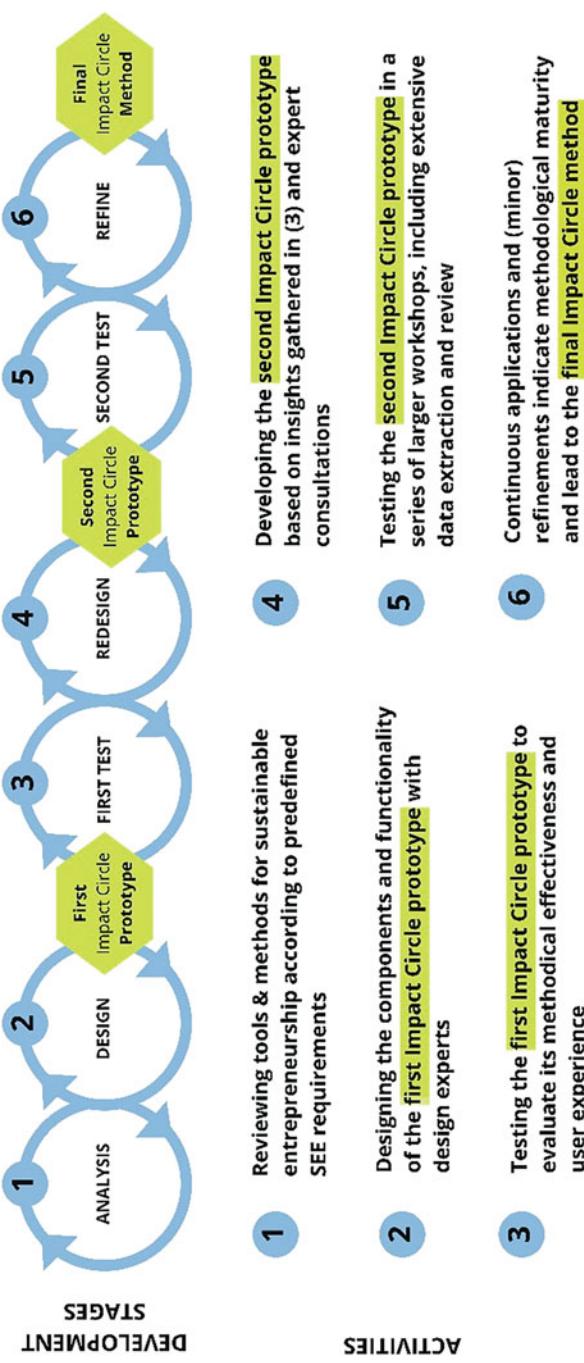


Fig. 1 Overview of the Impact Circle's development process

interviews. In addition, we presented the prototype to industry representatives and researchers at a scientific conference to obtain further feedback and improvement suggestions.

While the first application generally supported the Impact Circle's methodology, the results indicated that it required a redesign (stage 4). We discussed the findings with the design experts and realized several improvements within a second prototype. Furthermore, we enhanced the application review process by collecting additional and more systematic data.

The second Impact Circle prototype was applied in 2 online workshops with 50 students in total (stage 5). Twelve moderators supported the application by providing methodological guidance and collecting dense observational data on each participating team. We reviewed the workshops using extensive quantitative and qualitative data, encompassing (1) participant survey results, (2) +140 participant feedback notes, and (3) moderator observation forms. Moreover, we presented the Impact Circle to practitioners from university incubators to receive additional feedback. A data clustering enabled us to identify 132 insights containing improvement suggestions, praise, and general feedback, leading to some (minor) methodological enhancements.

In stage 6, we conducted additional five workshops with 107 participants to validate the adjustments to the Impact Circle's methodology. We deliberately applied the method in different contexts, including a university business incubation program and an offline workshop, to better understand its benefits for practice. We continued our data extraction strategy throughout the applications and hence gathered additional insights. As the results confirmed the Impact Circle's methodology and yielded only minor improvement suggestions, we concluded its maturity. Furthermore, we started dissemination activities using a website, meetings with practitioners, and conference presentations. Table 1 outlines the workshops performed during the method development process.

Given the few clear assessment measures in SBM tool development (Geissdoerfer et al., 2016), we employed various qualitative and quantitative indicators to assess the Impact Circle during its development, summarized in Table 2. Following the Impact Circle's main goal to trigger more integrated, sustainable business ideas, we developed the "high-impact ideas" indicator as a quantitative measure in addition to the qualitative participant feedback. It accounts for those ideas that the teams rated with high societal impact and high feasibility scores. An alternative approach could have been ratings by external experts. However, we decided to use team assessments instead because they (1) lower the bias of individual subjectivity, (2) entail a more informed evaluation as the teams can better judge the new idea related to their existing business model, and (3) are more convenient to implement in SEE. Nevertheless, adding expert ratings can mean a valuable extension, as they enable to control for potential biases, such as industry inexperience or overconfidence.

Table 1 Overview of Impact Circle workshops

No.	Development stage	Date	Participants (excl. moderators)	Teams ^a	Participants
1	First test	Jul 2020	7	2	Engineering students
2	Second test	Nov 2020	41	9	Business students
3	Second test	Dec 2020	9	4	Engineering students
4	Refine	May 2021	43	10	Business students
5	Refine	May 2021	11	3	Engineering students
6	Refine	Jun 2021	3	2	Start-ups
7	Refine	Nov 2021	45	10	Business students
8	Refine	Nov 2021	5	1	Engineering students
			164	41	

^aThe team sizes varied across and within the workshops. For instance, No. 5 and 6 included teams with one member, while No. 4 had a team with seven members. Across the workshops, the average team size was 3.66

Table 2 Overview of assessment indicators during the Impact Circle's development

Method		Results	
<i>User experience</i>	<ul style="list-style-type: none"> • User satisfaction ratings. • Qualitative feedback. 	<i>Creative stimulation</i>	<ul style="list-style-type: none"> • Number of ideas generated per team and participant. • Number of stakeholders identified per team and participant.
<i>Maturity</i>	<ul style="list-style-type: none"> • User satisfaction ratings. • Number of method improvement suggestions by participants. • Observations. 	<i>High-impact ideas</i>	<ul style="list-style-type: none"> • Number of ideas that a team rated with 4 or 5 on feasibility and impact using the impact matrix (see below).
<i>Bisociation</i>	<ul style="list-style-type: none"> • User bisociation ratings. • Qualitative feedback. • Observations. • Number of ideas generated. 	<i>Sustainability thinking during value mapping</i>	<ul style="list-style-type: none"> • Number of stakeholders identified in the Impact Circle's "civil society and politics" and "natural environment" categories.

4 Results

In stage 1, our methodology enabled us to identify seven criteria for SEE tools, such as ease of use, creative capacity, integrated sustainable thinking, and system perspective. Our desktop research identified 25 existing sustainable entrepreneurship

tools. However, only a few met the predefined requirements and are thus relevant to the SEE context. Among them, the value mapping approach of (Bocken et al., 2013) stood out as it satisfied most of the predefined requirements. However, even though it enables users to identify diverse stakeholder value effects, it falls short in exploring novel conflict-resolving ideas. Thus, we decided to build upon the value mapping approach and extend it.

The discussion with design experts in stage 2 suggested bisociation as the central mechanism for identifying sustainable business ideas. We conceptualized the first prototype as a stand-alone tool that builds on two steps. First, users reflect the sustainability of an existing business model by identifying its positive and negative impacts on different stakeholder categories along the value chain. Second, users develop sustainable business ideas by randomly combining the identified value effects using bisociation. During the initial testing, the research team observed first confirming evidence. The participants could quickly identify various and diverse stakeholders for a given case start-up in the last mile logistic sector, such as drone manufacturers, senior citizens, local policy-makers, and post offices. Moreover, their bisociation ability generated multiple novel ideas that entailed more sustainable business ideas, e.g., realizing the B2C approach within a sharing business model. Most importantly, during the interviews, the participants reported that they enjoyed the bisociation exercise as it enabled them to apply a creative perspective on business model innovation.

The prototype application in stage 3 provided mixed evidence. Albeit the participants confirmed the overall usability of the tool, the survey yielded an average overall rating of 4.14 and an average bisociation rating of 4.42 on a 7-point Likert-type scale (see Table 3), thus indicating a need for improvement. In addition, the

Table 3 Overview of the Impact Circle's survey and workshop results

No	Response rate ^a	Average rating method	Average rating bisociation	Average no. ideas p. participant (average no. high-impact ideas)	Average no. ideas p. team (average no. high-impact ideas)
1	100%	4.14	4.42	— ^b	— ^b
2	80%	5.64	6.03	4.63 (0.90)	21.11 (3.80)
3	66%	6.00	5.30	2.96	7.00
4	69%	5.56	6.12	3.33 (0.72)	13.90 (2.90)
5	— ^c	— ^c	— ^c	1.69	6.00
6	100%	6.70	6.30	— ^d	— ^d
7	44%	5.25	5.80	3.74 (0.9)	17.20 (3.75)
8	80%	6.00	4.75	2.75	11.00
		5.50 ^e	5.82 ^e		

^a N = 153

^b The Impact Matrix assessments were added to the methodology during workshop 2

^c No data collected

^d Given that start-ups participated, we faced time constraints and had to streamline the assessment; thus, tracking individual participants and comparative group performance were impossible

^e Weighted average rating

participant interviews revealed that team- and idea-related issues impacted the team performance. For instance, the team members missed a common understanding of the initial business model, which deteriorated the stakeholder identification process. Furthermore, the teams were overwhelmed by group discussions on stakeholder value effects and novel ideas. Some members reported that they contributed only little to the overall team performance due to opinion leaders. We realized that the Impact Circle's effectiveness is dependent on contextual conditions, such as the readiness of the initial idea or team commitment. Thus, we searched for a novel application case to better control the contextual conditions during the subsequent development process.

The research team discussed the findings with the design experts (stage 4) and revised the first prototype. First, we reconceptualized the Impact Circle as a workshop with guiding moderators to improve the teamwork. Second, we divided the value mapping and ideation steps into an individual task performed separated from the other team members to enable individual creativity and a subsequent team discussion. Third, we expanded the methodology by introducing two new steps, the Impact Draft and the Impact Matrix (described below) to account for contextual conditions. Fourth, we modified the stakeholder categories to enable a more nuanced identification of stakeholder value effects as suggested by the experts. For instance, we added "staff and shareholder" as a new stakeholder category to account for an internal organizational perspective. Moreover, we developed several inspirational questions for each stakeholder category to support the participants' stakeholder identification process.

The revised prototype and extended data extraction enabled several findings during the second pilot application (stage 5). As shown in Table 3, the participants rated the overall method and the bisociation better than the first pilot. Moreover, the data showed that the Impact Circle enabled the teams in workshop 2 to generate approximately 21 ideas on average, with approximately four high-impact ideas per team. The participant feedback and moderator observations enabled us to identify some (minor) method improvements. Most feedback focused on the workshop design rather than its methodology, which showed the increasing maturity of the Impact Circle. Major revisions comprised updated moderator guidelines, a simplified visual design, and more precise preparatory communication. Moreover, as suggested by the expert consultations, we extended the workshop introduction with some sustainable entrepreneurship theories, i.e., impact logical models and theories of changes.

Continuous applications (stage 6) provided further methodological confirmation. While the overall workshop and bisociation ratings varied per workshop, which might be explained by individual, group, or contextual factors, they generally remained high. After conducting 8 workshops, the weighted average rating for bisociation was 5.82 out of 7 and for the overall workshop 5.5 out of 7 ($N = 153$). On average, the teams generated between 6 to 17.2 ideas per team, with approximately 18 to 22 percent of them considered high impact and high feasibility. Furthermore, on average, approximately 38.7 percent of all stakeholders generated belong to the civil society and politics or natural environment category, thus indicating the Impact Circle's effectiveness in emphasizing holistic reflection. The

qualitative participant feedback provided additional insights. For instance, in workshop 7, we received 131 feedback comments, of which 72 percent contained positive feedback. Throughout the applications, the number of methodological improvement suggestions decreased to only four in workshop 7. Hence, our adjustments were only minor and focused on the workshop facilitation, such as rescheduling the breaks or an inspiration board with exemplary stakeholders. Given the supporting evidence, we concluded methodological maturity and initiated its dissemination.

5 Discussion and Conclusions

This chapter's goal was to develop a new SEE method that supports the discovery of sustainable business ideas. In the following, we answer our research question by elaborating the Impact Circle's application and outlining how bisociation contributes to SBM development.

5.1 The Impact Circle Method

The extensive method development process resulted in the final Impact Circle, displayed in Fig. 2. While it may also be a stand-alone tool, we developed the Impact Circle method as an interactive workshop. Given the time indications in Table 4, we experienced an optimal team size of three to four people with one moderator for every three teams. The final methodology contains six steps, whereby two are recommended but optional depending on the available time and overall context. Corresponding to our first research goal of facilitating impact assessments, the Impact Circle's steps 1 to 3 enable teams to understand their business model's various impacts. The first step is to elaborate on the value creation logic of an initial business model (1). This step enables the team members to systemize existing outcomes and impacts and prepares for the subsequent steps. Then, each team member brainstorms how the business model affects stakeholders (value effects) (2). The Impact Circle's visual design nudges its users to consider five stakeholder categories and describe both positive and negative effects. The value effect mapping thus spurs a holistic understanding of business model impacts (Bocken et al., 2013). The team then discusses and expands upon the identified effects (3). This step fosters a mutual comprehension of the value effects, triggers creativity for identifying additional effects, and ensures overall clarity and coherence.

Steps 4 to 6 correspond to our second outlined research goal of supporting the entrepreneurial discovery of more integrated, sustainable business ideas. In step 4, the teams build upon the value effects identified in steps 2 and 3 and use them as ideation inputs. Each team member chooses two (or more) effects and engages in bisociation thinking for generating ideas that *integrate* the effects (4). By creatively ideating solutions that address two negative effects or combining negative and positive effects, the team may *resolve* the negative consequences of their initial

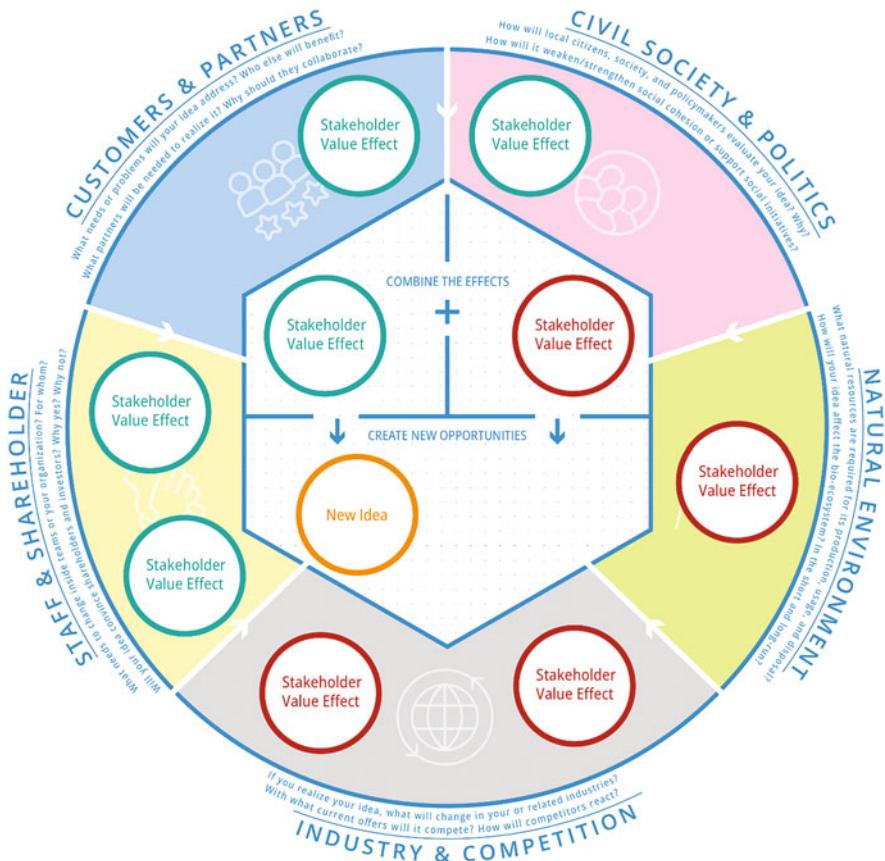


Fig. 2 Visualization of the Impact Circle method

business model, enhancing its sustainable impacts and transforming it into an SBM. In turn, by combining various positive effects, the teams may identify synergies and thus scale sustainable impacts. Ultimately, the emerging new ideas typically involve extensions and variations of the initial business model but also entirely novel business opportunities. Subsequently, as in step 3, the novel ideas are discussed and expanded within the team (5). Given that a team identifies approximately 15 ideas on average, the final step contains an optional rating exercise (6). The team members jointly assess the identified ideas concerning their feasibility and impact potential from “low” to “high” on a simplified 5×5 matrix. This step enables them to identify the most promising ideas, quick wins, and strategic opportunities and provides an informed basis for the next steps.

To support educators and other practitioners in applying the Impact Circle, we provide detailed instructions in Table 4, corresponding to our third research goal of developing a suitable method for the SEE context. More information for practitioners can be accessed on the Impact Circle website: www.impact-circle.com or www.impact-circle.de

Table 4 Overview of the Impact Circle method

#	Step	Tool	Time	Description	Illustrative example
1	Describe the initial business idea or model (optional)	Impact Draft canvas	20 min	The moderator introduces theories of change or related theories of sustainable entrepreneurship to introduce the workshop and set the stage. Subsequently, each team reflects their (or an external) business idea or model by outlining its value creation logic using the impact draft. This canvas-style tool distinguishes four simplified reflection areas: 1) underlying problem, 2) (business) activities, 3) outcomes, and 4) (societal) impacts	Problem: Customers cannot afford certain products, inefficient use of existing goods, overconsumption causes environmental issues Activities: Peer-to-peer platform offering a rental service for certain products (e.g., furniture) Outcomes: Decluttering and income for lenders, cost savings for borrowers Impacts: Raising awareness for product reusability, fostering manufacturers to produce durable products
2	Brainstorm diverse stakeholder value effects	Impact circle Individual board	20 min	Each team member reflects how the existing business model affects different stakeholders following the Impact Circle's five stakeholder categories. The user describes each <i>value effect</i> by naming the stakeholder, outlining the effect, and specifying whether it is negative or positive. If helpful, the users may also rate the stakeholder effect's magnitude. These processes are performed on value effect cards (or post-it notes in two colors), each card representing one stakeholder effect	Negative value effect 1: Transporting products and items from the owner to the renter may cause CO2 emissions Positive value effect 2: Products are used longer, promoting circularity, social cohesion. And environmental protection
3	Team discussion on value effects	Impact circle Central board	20 min	The team collects all value effect cards on the central board. First, all members present their value effect cards to the team. Second, the team discusses the mapping results and brainstorms additional effects	–

(continued)

Table 4 (continued)

#	Step	Tool	Time	Description	Illustrative example
4	Generate new ideas	Impact circle Individual board	20 min	Each team member randomly chooses two (or more) value effect cards and places them on their ideation board. Then, using bisociation, they brainstorm ideas that address, integrate, or resolve both effects and describe them on <i>idea cards</i> . If no new ideas emerge, the user returns the value effect cards to the central board, chooses new cards, and restarts	New idea: Add a new feature, “regional map,” it provides an overview of products and items in proximity to encourage lending between people who live nearby, thus avoiding additional CO2 emissions caused by transport
5	Team discussion on the new ideas	Impact circle Central board	20 min	The team collects all idea cards on the central board. Then each member pitches their ideas to the team. Second, the team discusses the ideas, refines them, or develops new ideas	—
6	Idea assessment (optional)	Impact matrix	20 min	The team rates all ideas by placing the respective idea cards on the sections of the impact matrix. This tool comprises a 5x5 matrix with two axes referring to idea feasibility and sustainable impact	The new idea is assessed with 4 on feasibility and 4 on impact. After a discussion, the team changes the feasibility rating to 5

5.2 Bisociation and Sustainable Business Ideas

We developed the Impact Circle to expand the value mapping approach of (Bocken et al., 2013) with bisociation as a means for identifying sustainable business ideas. It is beyond the scope of this paper to validate the proposed relationship between the sustainability of a business idea and bisociation thinking, which constitutes a promising avenue for future research. However, despite their limited explanatory power, our results indicate that bisociation contributes to SBM innovation.

First, throughout the workshops, the participants praised the “effect-combination approach” and the ideas it generated. In total, we received 34 positive feedback statements on bisociation, which account for 44 percent of the positive feedback statements and 9 percent of all comments. For instance, the participants commented, “[the method] triggers idea generation and causes you to take an alternative

approach” (workshop 2) or “[the method is a] useful mental model to think solutions for sustainability-related problems” (workshop 4). Second, across the cases, the participants rated the statement “I believe the combination of different stakeholder value effects is a promising approach in generating sustainable ideas” with 5.82 out of 7 on average ($N = 153$). Third, we observed that many participants described how and which stakeholder value effects they combined during the fifth process stage instead of simply outlining the new idea. We interpret this observation as an individual urge to display their subjective creativity in coming up with sustainable business ideas and their overall satisfaction with the methodology. Fourth, the various experts consulted during the development process recognized the “innovative” approach to SBM innovation, further supporting the potential of bisociation in sustainable entrepreneurship.

5.3 Contributions

Our chapter contributes to research and practice in three regards. First, we developed a novel method for SBM innovation that educators and other practitioners can apply using our instructions in Table 4. Second, our methodology illustrates a systematic process for developing a design-based innovation method for SEE. Various data types, research methods, contexts, and iterations exemplified a rigorous approach to designing SBM tools. Our findings may inspire future research to build upon our methodology. Third, we foster interdisciplinary research by integrating design science within sustainable entrepreneurship research. Finally, although previous research has largely neglected the topic, our findings illustrate bisociation as a promising phenomenon for understanding entrepreneurial cognition and creativity.

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Threshold Concepts in Entrepreneurship Education and their Implications for Teaching and Learning



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Abstract In view of the continuing growth and importance of entrepreneurship education within the educational landscape, there remains a significant demand for theoretical as well as practical approaches. In particular, there is a demand for approaches that shed light on the interplay between course design and individual learning. This chapter draws on the threshold concept approach, which is becoming an increasingly important perspective in educational research. Whilst the threshold concept approach has been applied usefully to develop the pedagogy of various academic disciplines, for example, economics, healthcare and information literacy, they have so far received little attention in the context of entrepreneurship education. The threshold concept approach addresses the question of how learners can practise an exploratory, reflexive approach to discipline and subject-area-specific ways of thinking and practising. The contribution of our chapter is twofold: firstly, we want to show that the threshold concept approach offers a new perspective for theory and practice in entrepreneurship education through its focus on bridging a disciplinary way of thinking and practising, on the one hand, and a subjective view of entrepreneurial phenomena, on the other hand. Secondly, in order to enrich entrepreneurial

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teaching and learning conceptualizations, this chapter presents a review of the candidate entrepreneurial threshold concepts which have appeared in the literature to date, in order to characterize them as a potential starting point for a promising field of research.

Keywords Threshold concepts · Entrepreneurship education · Entrepreneurial learning

1 Introduction

Whilst entrepreneurship education is becoming increasingly important within the high school and higher educational landscapes (Nabi et al., 2017; Kuckertz, 2021), there is still a lack of learning theory and pedagogical approaches in the practical design and scientific investigation of appropriate teaching-learning formats (Fayolle, 2013; Thrane et al., 2016). Systematic consideration is needed to discern how the micro-level (individual courses) and macro-level (curricula) can be designed to enable learners to intensively develop entrepreneurial ways of thinking and practising.

Following this need, we draw on the threshold concept approach (Meyer & Land, 2003a; Land et al., 2005), which is becoming an increasingly important perspective in educational research. Threshold concepts can be defined as those disciplinary concepts that are essential to the nature of a discipline, encompass characteristic ways of thinking as well as practising and provide learners with access to a new world of ideas or new ways of doing things associated with a certain disciplinary knowledge and content base (Meyer & Land, 2003b). The integrative characteristic of threshold concepts reveals meaningful relationships between further disciplinary concepts, but the process of understanding them can also contain difficulties for learners due to their transformative potential. Aligned with a focus on learner autonomy and a subjective perspective of entrepreneurial phenomena, they follow a constructivist view of individual learning—a perspective that is regarded as important within entrepreneurship education research (Robinson et al., 2016). Whilst the threshold concept approach has been applied usefully to develop the pedagogy of various academic disciplines, for example, economics (Barradell & Peseta, 2017), health and social care (Barradell & Peseta, 2017) and information literacy (Townsend et al., 2016), they have so far received little attention in the context of entrepreneurship education. Certainly, the popularity of the threshold concept approach appears to be more evident in comparatively newer subject areas and could be perhaps associated with their respective need to establish disciplinary identity. Therefore, the following research question arises: what contribution can the threshold concept approach make to entrepreneurship education?

In order to enrich entrepreneurial teaching and learning conceptualizations, this chapter presents a systematic overview of the candidate entrepreneurial threshold concepts appearing in the literature to date. After a theoretical introduction to the threshold concept framework and its relevance for entrepreneurial teaching and

learning, existing research approaches used to identify candidate threshold concepts in entrepreneurship are set out, and a systemic overview of the candidate entrepreneurial threshold concepts published so far is presented. Finally, implications for the practical integration of candidate entrepreneurial threshold concepts in entrepreneurship curricula are considered and research into entrepreneurship education using the threshold concept approach is discussed.

2 The Threshold Concept Approach

The threshold concept approach, which can be traced back to Meyer and Land (2003b), is gaining increasing recognition in the context of general as well as discipline-specific teaching and learning considerations. Threshold concepts are understood to be concepts that function in a similar way to ‘portals’ which allow learners to access a new, previously hidden view of disciplinary phenomena (Meyer & Land, 2003a, 2006a). They are associated with an expert perspective and function as ‘jewels in the curriculum’ because of their significance to a learner’s journey (Land et al., 2005). Like a doorway, tunnel or bridge, threshold concepts enable a fundamentally changed and transformative perspective of a discipline. Threshold concepts can consequently involve troublesome knowledge which may not be readily accessible to novices as a result.

According to Ashwin (2008) and Mead and Gray (2010), threshold concepts can be understood as objects, ideas and patterns of thought that share common properties. For example, the market concept hypothesized as an economic threshold concept (Ashwin, 2008) includes different categories such as the labour market, the financial market or the resource market, but has common characteristics such as demand, supply or price-quantity combination. In addition to this categorizing form, disciplinary ways of thinking can also be referred to as procedural threshold concepts (Davies & Mangan, 2006), if they are specific to a discipline and support the development of disciplinary contexts and models. For example, procedural threshold concepts in economics could be equilibrium considerations or the marginal principle.

Whilst not claiming theoretical status in the strictest sense, the threshold concept approach is in the tradition of cognitivist-constructivist learning theories such as cognitive development (Piaget, 1978), conceptual change (Strike & Posner, 1982) and transformative learning (Mezirow, 1991), which also occupy a central position within entrepreneurship education research (Geiger, 2022). What these theories have in common is that learners self-determine and actively co-create their own learning paths. The threshold concept approach bridges the gap between a disciplinary conceptual level, which is particularly concerned with the scientifically based development of specialized knowledge, and a subjective conceptual level, in which learners describe specialized phenomena from their individual perspective. Bringing together disciplinary and individual conceptual change is a critical step in better understanding and targeting the interplay between learning arrangements and

individual learning trajectories. This is probably one of the main reasons why the threshold concept approach has gained importance in the theory and practice of teaching and learning and is becoming increasingly relevant in various disciplines (Land et al., 2016).

2.1 *Attributes of Threshold Concepts*

Across a range of subject contexts, threshold concepts can be characterized by their transformative, irreversible, integrative, bounded, troublesome, discursive and reconstitutive attributes. These attributes are described in further detail in the following.

If a specific concept is to be called a threshold concept, it must be transformative. Once understood, its potential effect on a student is to bring about transformational learning that includes a significant change in how the student perceives the discipline (Meyer & Land, 2003b; Meyer & Land, 2005). Threshold concepts not only transform epistemologically but also lead to a transfiguration of identity and the adoption of new external discourse. Grasping a threshold concept ‘involves an ontological as well as a conceptual shift. [...] New understandings are assimilated into our biography, becoming part of who we are, how we see and how we feel’ (Cousin, 2006, p. 4). This process of transformation can be likened to the learner adopting a fluid state as they pass across, along and through the portal. It is a chaotic journey across conceptual terrain (Cousin, 2006), which involves changes in ways of knowing, becoming and being, where the latter represents the agency to think in the subject (Timmermans & Meyer, 2019).

Corresponding with their transformative potential, threshold concepts fulfil an integrating function. When a person grasps a threshold concept, what formerly appeared to be different and dissimilar elements are brought into a coherent relationship (Cousin, 2006; Baillie et al., 2013). The experience can be likened to adding a particular jigsaw piece that completes the picture to enable a new and meaningful perspective of the whole. Students become aware of ‘the previously hidden interrelatedness’ of concepts, beliefs and theories (Meyer & Land, 2005, p. 373). Threshold concepts provide them with a ‘window’ that assists them in understanding the disciplinary dimensions of a subject and its underlying structures. Mastering a threshold concept enables individuals to make connections that were hitherto hidden from their perspective (Cousin, 2006).

The learning and transformations involved in fully grasping or understanding a threshold concept are irreversible. Once learned, a threshold concept would be very ‘unlikely to be forgotten or unlearned only through considerable effort’ (Meyer & Land, 2005 p. 373). This characteristic reflects the cognitivist-constructivist theoretical basis that assumes that individual world views are robust and resistant to external perturbations (Geiger, 2022). Baillie et al. (2013) contend that ‘once understood the concept cannot become “not-understood”’ (p. 229). This may be part of the reason why some experts find difficulty in accepting why some students

do not understand what seems blindingly obvious to them (Meyer & Land, 2003b). Expert practitioners looking back across thresholds they have personally long since crossed find it difficult to understand (from their own transformed perspective) the difficulties faced by students from the student's (untransformed) perspectives (Meyer & Land, 2005).

Threshold concepts tend to be experienced as troublesome. They may represent, or lead to, what Perkins (2006) describes as 'troublesome knowledge'. This is knowledge that is conceptually difficult because of its counterintuitive nature which may be subversive, alien (emanating from another culture or discourse) or incoherent (where discrete aspects are unproblematic but there is no obvious organizing principle). Threshold concepts might not be easily assimilated or accommodated within one's existing frame of meaning. As such, they can often be troublesome as they entail a letting-go of earlier, comfortable positions and encountering less familiar and sometimes disconcerting new territory that transforms the learning of a person (Meyer & Land, 2003b; Cousin, 2006). The transformation, though necessary for progress within the subject, may prove 'personally disturbing and disorienting, leading to hesitancy or even resistance in learners' (Meyer & Land, 2003b, p. 3). It is through encounters with troublesome knowledge that students can revise their prevailing conceptions, consider matters differently, think otherwise and see anew. This can be exhilarating and liberating, but it can also prove unsettling and uncomfortable. However, without a certain amount of anxiety and risk, there is a limit to how much learning occurs: 'One must have something at stake. No emotional investment, no intellectual or formational yield' (Shulman, 2005, p. 22).

Threshold concepts may also be bounded in conceptual spaces that have terminal frontiers (Meyer & Land, 2005). Such boundedness may in certain instances serve to constitute the demarcation between disciplinary areas and define academic territories. The establishment of such boundaries may raise issues relating to hierarchy and relations of power within learning environments and epistemic communities (Cousin, 2006). One should be aware, for instance, that since a threshold concept can be a form of disciplinary property, its presence in a curriculum 'may carry an inherent tendency to invite congealed understandings' (Cousin, 2006, p. 4). One mitigation implicated by this tendency is to adopt an attitude of questioning the concepts themselves, perceiving their explanatory capacity as provisional, temporal (in that it is being continually socially (re)constructed) and contextual.

Meyer and Land (2005) also posit discursive and reconstitutive attributes of threshold concepts and suggest that learning a threshold concept will necessarily incorporate an enhanced and extended use of language. They contend that 'it is hard to imagine any shift in perspective that is not simultaneously accompanied by (or occasioned through) an extension of the student's use of language' (p. 374). Besides leading to a transfiguration of identity, threshold concepts facilitate the adoption of a more elaborate discourse and the capacity to meaningfully participate in the high-level narratives of a subject that express and reflect a new level of thinking in the discipline (Baillie et al., 2013). These aspects indicate a person who belongs to an epistemic community.

2.2 Importance of Threshold Concepts Framework for Entrepreneurship Education

A major concern in entrepreneurship education research is a lack of identified approaches with the potential to make significant contributions to learning theory and pedagogical issues (Fayolle, 2013). This may be explained by the fact that entrepreneurship education has attracted scholars from many different disciplines and become a highly multidisciplinary field, which has led to a very fragmented scholarly community. Legitimacy for entrepreneurship in academia has been anchored in ‘external stakeholders’ (practitioners, policymakers and politicians) (Landström & Harirchi, 2018). Without a conceptual framework or clear theoretical grounding, the academic identity of entrepreneurship is especially susceptible to external forces, such as genericism, market and economic trends (Hatt, 2020); hence, its identity as an academic subject is fragile and vulnerable. When entrepreneurship education is defined by its measurable usefulness in application, it loses sight of its core purpose and becomes pulled in many different directions, destined to fail. Not having evolved from other academic disciplines, entrepreneurship is still in search of its academic identity (Wiklund et al., 2019). The boundaries of entrepreneurship as an academic subject require definition, so both what it is and what it is not are clear. The threshold concept approach addresses these issues and offers the opportunity to define entrepreneurship as being about who the learners become and also about what knowledge they come to possess.

Although entrepreneurship education can build on several constructivist learning theoretical considerations such as cognitive development or transformative learning, there is still a lack of understanding of the mechanisms that encourage learners to work on their individual opportunity nexus (Shane, 2003). It seems common sense that entrepreneurial learning may include different dimensions such as cognitive, emotional and motivational aspects that all have an impact on how and what is learned. For example, Mitchell et al. (2017) take a cognitivist perspective and draw attention to the development of individual entrepreneurial scripts during entrepreneurial learning. Arpiainen et al. (2013) study the importance of emotions in entrepreneurial learning processes, highlighting that emotional experiences during the learning event such as “joy” or “fear” can have an impact on the learning. However, there is still a lack of understanding of the interplay between these dimensions in entrepreneurial learning processes. In this context, Krueger (2017) draws attention to the fact that entrepreneurial learning can be understood as a transformation process from a novice perspective to an expert perspective of entrepreneurial phenomena such as founding or innovating. The encounter with ‘critical developmental experiences’ (Krueger, 2017) is identified as a learning opportunity that can lead to an updating of subjective beliefs regarding entrepreneurship and is characteristic of the novice-expert transformation. In this, there are striking parallels to the threshold concept approach, within which the encounter with threshold concepts can trigger such an exploration and actualization of subjective beliefs and associated behaviours. It is especially the transformative character of threshold

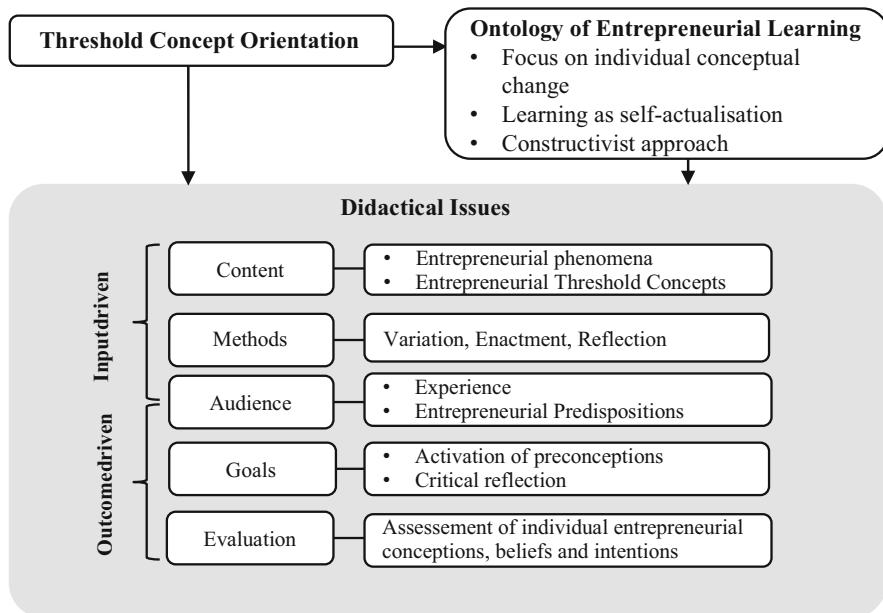


Fig. 1 Implications of the threshold concept framework for entrepreneurship education

concepts that implies that not only an accumulation of knowledge takes place, but that learners shape this process independently and construct their own knowledge and identity.

Beside the ontology of entrepreneurial learning, threshold concepts inform different didactical aspects of entrepreneurship education (Fayolle, 2013). With regard to curricular integration, the threshold concept framework proposes content that is suitable for an approach to phenomena which are typical of a discipline. The aim is always to enable learners to relate this content to their own lifeworld and to question their previous perspective of disciplinary phenomena. With regard to the methodological dimension, educators should vary those phenomena to enable learners to recognize them in different contexts. Value creation, for example, may occur in profit-oriented firms as well as in non-profit-orientated social enterprises (Geiger, 2022). With regard to the learners, learning goals and the evaluation of learning, threshold concepts enable a focus on the individual perception of entrepreneurial phenomena. Thus, this approach differs from others that, for example, aim at the development of beliefs, behavioural intentions or competencies of learners. The subjective nature of threshold concept learning requires the use of appropriate diagnostic instruments such as concept maps, which can be used to capture individual perceptions. Figure 1 illustrates how the threshold concept framework may inform different aspects of entrepreneurship education.

The threshold concept approach offers a deeper understanding of how learners shape their individual transformation process. It is the potentially troublesome

knowledge that can be hidden in threshold concepts that can cause previous thinking patterns to consequently prove dysfunctional, for example, existing routines in entrepreneurial decision-making (Cope, 2003), and for learners to disengage from them. As they start to understand a threshold concept, learners enter a liminal space within which they test new thinking patterns. In coping with this mental suspension phase, positively or negatively valenced emotions can occur, which can support or inhibit learners in pattern testing. The threshold concept approach offers potential for connection here in two ways. Firstly, the transformative, arduous potential of threshold concept understanding can trigger such critical learning phases within the individual learning process, and secondly, threshold concept characteristics offer criteria by which individual learning progress can be operationalized (Geiger, 2022). For example, it can be assumed that a person with entrepreneurial expertise uses language differently to novices. This could be an alternative to operationalizing expertise, which has so far often been operationalized through measuring the duration of a particular activity.

Entrepreneurial learning is conceptualized in this way both as acquisition and participation. Knowledge and understanding of entrepreneurship are both cognitively and socially constructed through research and practice. The objective of entrepreneurship education is then to further the knowledge and understanding of entrepreneurship in the students both in terms of what they know and who they are and to enable them to understand how an entrepreneur thinks and practises in the world (Hatt, 2020). Having set out the arguments for fruitful course design and curriculum development using the threshold concept framework, we now provide an overview of entrepreneurial candidate threshold concepts in the literature.

3 An Overview of Candidate Threshold Concepts in Entrepreneurship

Despite the growing attention to the threshold concept framework in manifold disciplines, there is little published work concerning threshold concepts and entrepreneurship. To our knowledge, only few studies, namely, Bolinger and Brown (2015), Vidal et al. (2015), Geiger et al. (2016), Hatt (2018), Hatt (2020) and Geiger (2022), explore threshold concepts in entrepreneurship education. From a disciplinary perspective, discussing potential candidate entrepreneurial threshold concepts is an interesting way to surface which concepts lie at the very heart of entrepreneurship. Entrepreneurial threshold concepts also offer a means to address pedagogical issues, as they describe a systematic approach for entrepreneurial course design as well as curriculum development.

Candidate threshold concepts in entrepreneurship hypothesized in the literature to date that we are aware of are as follows:

- *Corporate social responsibility, business ethics and sustainability*, hypothesized as threshold concept by Vidal et al. (2015).

- *Failure*, Bolinger and Brown (2015); *iterative experimentation*, Hatt (2018) and Hatt and Jarman (2021).
- *Effectuation*, established by Sarasvathy (2001a), hypothesized as threshold concept by Geiger et al. (2016).
- *Recognise their agency/taking action*, Hatt (2018) and Hatt and Jarman (2021).
- *Knowledge is always partial and often ambiguous*, Hatt (2018) and Hatt and Jarman (2021).
- *Entrepreneurship is a practice*, Hatt (2018) and Hatt and Jarman (2021).
- *Context is opportunity to create value*, Hatt (2018) and Hatt and Jarman (2021).
- *Value is defined by others*, Hatt (2018) and Hatt and Jarman (2021).
- *Business models*, hypothesized as threshold concept by Geiger (2022).

Threshold concepts are especially significant for disciplinary teaching and learning because they address specific phenomena and ways of thinking, and as a consequence their potential for entrepreneurship education must be highlighted. The listed concepts gain their threshold concept status potential by fulfilling the specific attributes as discussed in Sect. 2.1. In this section the subjective perception of entrepreneurial phenomena such as venture creation and innovation as well as the positioning of one's own person in relation to these phenomena will be discussed in particular.

All candidate threshold concepts from the list above have transformative potential with regard to the perception of entrepreneurial phenomena. Vidal et al. (2015) see 'corporate social responsibility, business ethics and sustainability' as a threshold concept that embeds entrepreneurial activity in a context that lies outside of classic shareholders such as owners. It becomes clear that corporate values can also be felt by people beyond shareholders and that companies can be part of a social ecosystem. This view expands classical profit considerations based on margin accounting and thus exhibits transformative potential for learners.

Whilst a lay perspective of 'failure' often has negative connotations, Bolinger and Brown (2015) observe that expert entrepreneurs have a much more complex conceptual structure in this regard and are more likely to interpret failure as a starting point for building expertise. In this way, it is possible to open up previously hidden contexts of meaning and to open up new conceptual spaces. Interpreting failure from such a perspective can be troublesome for learners. This is especially true when failure is accompanied by negative feelings and leads to resigned behaviour. In this respect, dealing with failure as a process of 'iterative experimentation' within entrepreneurship education can lead to learners reflecting on their own and others' failure moments (e.g. in the form of case studies) and understanding them as opportunities for learning and expertise building.

'Effectuation' also harbours transformative potential, which lies especially in the orientation towards possible ends-means combinations. Effectuation itself is explicitly referred to as a 'theoretical shift' (Sarasvathy, 2001b) and offers a specific, contingency-based perspective of entrepreneurial phenomena. It also opens up new contexts of meaning insofar as a conceptual separation of plannability and control occurs. Effectual principles of action require a focus on controllable actions and thus

demand, for example, that existing means instead of abstract goals be made the starting point for entrepreneurial decisions or that competitors be simultaneously regarded as potential partners (Sarasvathy, 2008). The transformative potential of effectuation is only made possible by the inclusion of causal ways of thinking, so that these are particularly helpful for learners when they find their way into entrepreneurship education in a contrasted way, allowing learners to reflect on their perspectives (Geiger, 2022). This can, for example, fundamentally change the view of relationships with other people or existing resources. This small-step approach enables a new perspective of such entrepreneurial contexts, which are characterized by high degrees of freedom and are described in the research literature as ‘uncertain’, ‘complex’ or ‘dynamic’ (for overviews, see Liening et al., 2016; Liening (2017)). For learners, adopting an effectual mindset may be fraught with difficulty, especially if they are oriented towards plannability and predictive logic. In this context, Dew et al. (2009) illustrate that an effectual approach involves awareness of abortion criteria (‘affordable loss’)—a fundamental contrast to decision criteria focused on profit maximization.

According to Bandura (2006), *human agency* is about intentionally influencing one’s functioning and life circumstances. When an individual recognizes their agency, they see value creation as a self-organizing, proactive and self-regulating individual. They see the world as a person who reflects on their behaviour and learns from it, in order to contribute to their life circumstances. Personal efficacy is described by Bandura (2006) as a foundation of human agency, ‘Unless people believe they can produce desired effects by their actions, they have little incentive to act, or to persevere in the face of difficulties’ (Bandura, 2006, p. 170). Thus, ‘Recognise their agency’ can be explained as a combination of entrepreneurial intentionality, entrepreneurial forethought, entrepreneurial self-reactiveness and entrepreneurial self-reflectiveness. Entrepreneurial intentionality can be described as the intention to create value, including action plans and strategies for realizing action plans. Entrepreneurial forethought can be described as the setting of value creation goals and anticipating likely outcomes of prospective actions to guide and motivate efforts to these ends. Entrepreneurial self-reactiveness can be described as not only the deliberative ability to make choices and action plans with the aim of creating value, but also the ability to construct appropriate courses of action and to motivate and regulate their execution. Entrepreneurial self-reflectiveness can be described as the act of reflection on personal entrepreneurial efficacy, the soundness of associated thought and action and the meaning of entrepreneurial pursuits, making corrective adjustments as necessary. The importance of this threshold concept is highlighted by Jones (2019) as the aim of all entrepreneurship education globally. He described Entrepreneurial Agency as the ‘essential capability argued to be the minimal outcome for EE [entrepreneurship education, t. a.]’ (Jones, 2019, p. 244). Jones (2019) defines being entrepreneurial as being capable of self-negotiated action. He argues that self-negotiated action is prerequisite for and precedes value creation. ‘Taking action’ is taken to incorporate self-reactiveness, in particular both the making of and the execution of plans to create value.

'Knowledge is always partial and often ambiguous' also links to effectuation theory (Sarasvathy, 2001a). Sarasvathy (2001a) proposes that entrepreneurs are experts at exploiting contingencies that cannot be easily analysed or predicted and builds her theory on four principles which incorporate this idea of partial and ambiguous knowledge: affordable loss (contrasted with expected returns), strategic alliances (contrasted with competitive analysis), exploitation of contingencies (rather than exploitation of pre-existing knowledge) and controlling an unpredictable future (contrasted with predicting an uncertain future). Practitioners understand that you can still act even if the situation is not perfect, ideal or even favourable—but that the process of taking action is likely to lead to new situations, learnings and, ultimately, opportunities (Hatt & Jarman, 2021).

'Entrepreneurship is a practice' draws on a practice perspective from social science (De Clercq & Voronov, 2009), enabling a broader societal structure and the shared understandings that guide human behaviour, to be linked with a focus on the granular detail of everyday life. This construes people as improvisers whose identity and external environment are jointly and simultaneously co-created. Johannsson (2011, p. 136) signals a need for a framework that acknowledges entrepreneurship as 'an (everyday) hands-on practice, including routines as well as improvisation in order to cope with coincidence'. There is growing recognition that entrepreneurship is unlikely to be fully explained in the creation of a single venture (Wright et al., 1997) and some research has been done into the phenomenon of the 'serial' or 'habitual' entrepreneur, implying that value creation can be a habit and therefore contains transformative as well as irreversible potential. Others have emphasized the importance of habitual entrepreneurship, contrasting it with 'one-shot' entrepreneurship in scholarly efforts to build a comprehensive theory of entrepreneurship (Thorgren & Wincent, 2015).

Opportunity recognition is a well-researched area in entrepreneurship literature (Baron, 2006) and can be described as consisting of three aspects of recognition: actively or passively searching for opportunities, alertness to opportunities and prior knowledge enabling opportunity recognition. The basic cognitive process of pattern recognition has also been highlighted by Baron (2006) as a possible explanation of entrepreneurs' abilities to recognize opportunities. Shane (2003) presents a theory of entrepreneurship at the nexus of enterprising individuals and valuable opportunities. 'Context is opportunity to create value' also draws on effectuation, and the ways in which thinking and practising like an entrepreneur mean assuming all contexts not only are the source of opportunity for the creation of value but also present the means with which to bring it to fruition. Practitioners habitually and constantly create and recognize opportunities within their own context to create value (Hatt & Jarman, 2021).

'Value is defined by others' is associated with design thinking (Brown, 2008) where innovation is derived from a thorough understanding of what people want and need in their lives and what they like or dislike about what they currently have access to. Brown (2008) associated design thinking with empathy and a 'people first' approach. It also relates to the marketing theories of market research, customer

value (Slater, 1997), market orientation (Jaworski & Kohli, 1993), customer development (Blank, 2013) and customer engagement (Harmeling et al., 2017).

The development of ‘business models’ as a threshold concept offers a consideration of the interplay of different aspects of organizational value creation (e.g., value proposition, revenue, cost) into a common architecture (Geiger, 2022). This makes it possible to consider the interplay of different aspects and thus to reflect on the value creation logic of organizations or to develop one’s own. This opens up a perspective for learners that includes a development-oriented view of organizations (Teece, 2010). Business models can also be used in different contexts and allow for the consideration of organizations that operate in the non-profit sector. Here, too, value propositions, customer segments, expenditures and revenues exist without having to aim for profits. In this, there is a conceptual link to the corporate social responsibility concept mentioned above, which involves an expansion of value creation beyond monetary terms. Due to their complexity, which, on the one hand, lies in the multitude of value creation aspects and, on the other hand, in their interaction, business models can at the same time be transformative and troublesome for learners. The business model concept of Gassmann et al. (2013) comprises four, the business model concept of Osterwalder and Pigneur (2011) nine aspects that have to be brought into a meaningful context by learners. Business models have conceptual overlap with other lean approaches that are central to the development of business models and products, all of which take a small-step approach to developing business ideas (Shepherd & Gruber, 2020).

4 Discussion and Conclusion

The aim of this chapter was, firstly, to use the threshold concept framework to offer a new approach to investigating the interplay between entrepreneurship education, on the one hand, and individual learning paths, on the other hand. Its distinct feature is that it focuses on the subjective perception of disciplinary phenomena and therefore differentiated from other approaches such as competencies or behaviours and gives rise to important implications for the design of courses and curricula. Secondly, we have reviewed the current status of candidate threshold concepts hypothesized for entrepreneurship. Applying the threshold concept framework to entrepreneurship facilitates the planning and enactment of teaching and learning and assessment (Meyer & Land, 2003b; Baillie et al., 2013; Shanahan et al., 2006). Threshold concept can help educators explain the difficulties students encounter during the learning process, by providing links between the outcomes of learning and the deep or surface approaches to learning adopted by students. This can be used to better understand the impact on curriculum design and teaching approaches (Cousin, 2006) and assist reflection on what is being taught, how, why and when to streamline teaching and assessment approaches (Barradell, 2013).

The threshold concept framework can also be used as a lens to demarcate entrepreneurship, making a case for entrepreneurship as an academic subject in its

own right, as well as to improve the effectiveness of entrepreneurship curriculum. ‘A threshold concept necessarily helps to define the boundaries of a subject area because it clarifies the scope of a subject community’ (Davies, 2006a). Research using the threshold concept approach promotes the development of discipline and subject-specific pedagogies and situates learning, acknowledging contextual considerations (Cousin, 2008). If candidate threshold concepts in entrepreneurship can be suggested, the boundaries of entrepreneurship may be set. Then an understanding of the student perspective of what it is to think ‘like an entrepreneur’ may be sought and ways to educate students in how to think ‘like entrepreneurs’ may be developed.

From a teaching and learning perspective, identifying threshold concepts in entrepreneurship is useful for entrepreneurship educators in a number of respects. Identifying some concepts as ‘threshold’ offers a way of differentiating between core learning goals which enable the learner to see things in a different way and other learning goals which do not have the same significantly enabling and transformative effect (Bolinger & Brown, 2015). This allows the educator to focus on the conceptual understandings that enable a fuller understanding of the subject and foster integration of knowledge, avoiding an overcrowded curriculum. Perhaps more importantly than designing the educational curriculum, the educator also has to be developed as an important stakeholder of the process. Entrepreneurial learning may include different dimensions like cognitive, emotional and motivational aspects. This also means it is not enough to know what has to be taught, but also how to teach it. Hägg and Jones (2021) urge entrepreneurship educators to tear down the inefficient walls and barriers with other professions and teaching settings by fostering a more open learning system that is tied to the community.

Knowledge of such threshold concepts can assist educators in developing and managing an entrepreneurship curriculum—employing a threshold concept approach for curriculum design (Cousin, 2006). It is in this sense that threshold concepts have been referred to as the ‘jewels in the curriculum’ because they help identify key areas that need mastery (Land et al., 2006). Hence, identifying what the threshold concepts are in entrepreneurship education is an important first step in curriculum design.

These threshold concepts can enable learners to better perceive the integrated nature of entrepreneurship. This is a major issue of teachers, that of helping students to ‘get inside’ the subject (Davies, 2006b, p. 76). The entrepreneurship curriculum should not be taught in isolated pieces but as an integrated part of a whole learning experience that encourages lifelong learning. Through a deliberate and conscious effort, educators can understand better the learners’ experience in terms of how students learn a particular threshold concept and recognize when an ‘aha’ moment of understanding has been reached, but also how and why a student can get stuck in their learning journey.

A number of pedagogical issues can be considered when trying to support students in grasping entrepreneurship threshold concepts. Once a threshold concept has been hypothesized, educators are encouraged to provide students with basic concepts that may be open to variation (Meyer & Land, 2003b) but that form a foundation that can later be reworked when further teaching and learning takes place.

This should be a gradual process informed by learning variation and the creation of awareness among students that tolerating uncertainty is a common part of the learning process. In due course, the knowledge of variation will inform new forms of pedagogical practice (Baillie et al., 2013). Attention must be given to the manner in which students are initially introduced to threshold concepts (Davies, 2006b). If a teacher introduces a threshold concept too early, it might be rendered inaccessible by the student and only learnt in a rote fashion (Davies, 2006b).

Educators should be aware that there exists variation in how they think about and understand entrepreneurship threshold concepts. They tend to develop knowledge of, and strategies for teaching and learning that are related to the sociocultural structures and mediated by their personal epistemologies. Educators need also to be aware that not all students experience threshold concepts in the same way. This realization might prove transformational for teachers as it influences their approaches to designing instruction (Timmermans & Meyer, 2019). The degree of troublesomeness associated with a particular threshold concept encountered by individual learners will also vary (Meyer & Land, 2006b). Some learners are willing, or even eager, to enter the liminal space in the hope of emerging transformed or coming to a new way of understanding, whilst others pause at the entrance seemingly unable or unwilling to let go of their pre-existing understandings. There is also individuality in the timing of the actual threshold crossing; understanding might also frequently be sighted and rejected on several occasions and only gradually accepted, if at all (White et al., 2016). Educators need to create ‘holding environments’ to safely support students through their experiences of difficulty in order that they may move on and succeed (Meyer & Land, 2006b). To help students acquire entrepreneurship threshold confidence and cross a threshold, educators need to cultivate the affective dimension of threshold concepts and help the learners believe that they belonged on the other side’ (Felten, 2016, p. 6). Timmermans and Meyer (2019) maintain that this affective component involved in threshold concepts learning is an area that requires much further research. Educators need to be conscious that encounters with threshold concepts tend to be emotionally charged. They need to cultivate supportive attitudes and classroom climates that emphasize the value of personal relationships and enhance a safe classroom environment where students can actively participate in the learning process (Mizzi & Bartolo, 2007; Mizzi, 2018).

The perspectives opened up in this chapter provide potential for further research. The threshold concept framework can usefully enrich the ongoing discussion of the essence of entrepreneurship as a distinct discipline, for example, in relation to possible entrepreneurial concepts in the context of the proposed attributes (transformative, troublesome, etc.). In addition, threshold concepts offer an idea of how a novice-expert transformation can be modelled. There is rich potential for further research to explore how threshold concept encounters provoke emotional, cognitive and motivational aspects within entrepreneurial learning and influence the learning process.

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Using Technology to Teach International Entrepreneurship: State-of-the-Art Practices and Opportunities



Cathryn Peoples and Siddhesh Kotwal

Abstract With a perspective that experience may be the best teacher, international entrepreneurship (IE) has long been exposed to limited ability to immerse oneself in a local opportunity, without undertaking a potentially large risk (in terms of, for example, cost, relevance of the entrepreneurship opportunity until in position, travel). However, the availability of and involvement with online technologies are changing the educational landscape in general, with the impact of introducing new opportunities which can benefit, specifically we believe, the international entrepreneurship learning experience. In this chapter, we therefore examine the modern approaches to using technology in support of teaching and learning pedagogy, with a view to recognising the contributions and benefits it can introduce. We recognise that technology is widely underutilised in the opportunities it introduces for immersing oneself in a remote international entrepreneurship opportunity, and we argue that there is an opportunity to support more realistic IE teaching and learning through its use. In this chapter, we therefore review the ways in which technology has been used to support teaching and learning in domains other than IE, before we consider its relevance in relation to IE education.

Keywords Technology · Teaching · International entrepreneurship · Distance education · Pedagogy

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1 Introduction

While online learning is generally widely supported, there are many people, including both students and tutors, who prefer to teach and learn in a face-to-face environment (McDougall et al., 1994). This level of interaction is considered to be a crucial element of successful education in general—following a social constructivist approach – and particularly for less independent learners (Balan et al., 2017). We might assume that those who voluntarily opt into the online educational experience have the personal skills to perform well here (Wach & Wehrmann, 2014)—they may be, for example, solitary, intrapersonal learners. Those who have not chosen to operate in an online mode, on the other hand, such as those forced into this education model as a consequence of Covid-19, may find the experience particularly challenging and not get the most out of the opportunities available (Wach, 2015). This consideration can be correlated with the teaching of international entrepreneurship (IE), where technology may be one of the only ways to facilitate realistic learning experiences. The use of technology will create situations where students have to operate online for exposure to the valuable learning opportunities. This can be challenging when students and tutors have limited technical abilities to participate in such experiences and where hardware and software resources are limited. Nonetheless, we argue that this may be the most scalable and sustainable way to facilitate realistic and valuable IE learning experiences.

In this chapter, we present an understanding of the challenges with teaching and learning (T&L) in the online mode, the desires of students in their IE T&L experiences and potential ways in which this process can be facilitated using modern technologies for the benefit of all.

2 What Is International Entrepreneurship?

International entrepreneurship involves the formation and exploitation of profit-earning opportunities that require venturers to be proactive and innovative while understanding and considering the cross-border differences in entrepreneurs and their organisation based on cultural beliefs and attitudes towards entrepreneurship (Wang et al., 2018). Barriers to international entrepreneurship include language, cultural differences and difficulties of understanding the foreign market. These barriers are additional to the general barriers to entrepreneurship, which include gender, age, disposable resources, risk-taking and personal commitments, to name a few. The authors of (Cumming & Zhan, 2018) discuss recent trends in IE, which take into account the new ventures made possible through new internationalisation efforts, and consider the impact of modern technologies in supporting IE learning.

3 Theories of International Entrepreneurship

Some researchers believe that IE is a culmination of international business and entrepreneurship, such as in (Cumming & Zhan, 2018), while others insist that it also involves strategic management, such as in (Zahra, 2021) and (Bell & Kozlowski, 2008). International business differs from international entrepreneurship—the former bases its roots more thoroughly in internationalisation theory, and transaction cost theory and is influenced by economic factors resulting in internationalisation (Keis et al., 2017). These fields are similar in the sense that try to understand which countries possess competitive advantages over other countries (Crick et al., 2020) and which countries will consume more products from developed countries (Morgan, 2014); they are focussed on the theories of product cycles (Durand, 2018), bargaining theory (Higgins & Savoie, 2017) and global strategic rivalry (Allen, 2016). For a business, strategic management involves the implementation and execution of certain performance-enhancing initiatives by management on behalf of the owners (Pradita et al., 2019), while international entrepreneurship involves entrepreneurs handling the responsibility of strategic management. Most importantly, international entrepreneurship sees the entrepreneur as an economic agent who identifies and makes the most out of opportunities on an international basis (Keis et al., 2017).

International entrepreneurship can be considered to be based on the following concepts:

1. **New international ventures:** In this sense, a ‘business organisation that, from inception, seeks to derive significant competitive advantage from the use of resources and the sale of outputs in multiple countries’ (Smith et al., 1997).
2. **Born globals:** Enterprises that enter at least three foreign countries or have exported to at least two foreign countries (Mukesh et al., 2020); thus these firms are, in the first place, explicitly global (Etemad & Lee, 2003).
3. **Rapid internationalisation/accelerated internationalisation:** Involves firms exploring opportunities frequently to rapidly expand internationally (Porter, 1990).
4. **General models of international entrepreneurship:** These models can be either a stimulus-response model, multi-stimuli model or a matrix model (Etemad & Lee, 2003). (Bell & Kozlowski, 2008) gives a comprehensive perspective of the broad concepts of international entrepreneurship, classifying the concepts based on the pace of internationalisation and the initial geographic market orientation.

4 How Is International Entrepreneurship Taught in Practice?

Some argue that it is difficult to teach entrepreneurship in any sense, with the perception that this is a skill naturally embodied, or not (Vissak & Masso, 2017). IE is therefore a subject with opportunities to examine the teaching approach for particular effectiveness. Researchers continue to examine the most effective approaches to teach in general, with the evolution of learning styles as one example of how this can be facilitated. Human needs, as participants in the educational experience, continue to evolve in different directions. With greater proportions of society generally moving into online learning experiences, advancements in technology and students increasingly managing competing life pressures in parallel with study, teaching mechanisms are similarly evolving in response.

One approach to teaching international entrepreneurship is to visit countries with contrasting living circumstances and to examine the entrepreneurial activities in place there (Gudoniene & Rutkauskiene, 2019). This approach may be considered to be one of the most valuable; however, it brings challenges with expense and subsequent sustainability and scalability. Furthermore, with students being educated in online avenues in parallel with competing life pressures such as employment and/or family, being present in an alternative economy may simply be an opportunity they do not wish to explore.

Technology, on the other hand, can bring alternative cultures closer. However, while rapid technological change has been attributed as being one of the contributors supporting the internationalisation of entrepreneurship (Ocvirk, 2017), there is an irony in that technology has not played a similar critical role in teaching international entrepreneurship. Modern technologies are still relatively underutilised in the teaching role for a variety of reasons which include the availability of technology and technical expertise with using it. This can be considered to be true from both the teaching and student perspective.

Given the opportunities for using technology to support remote learning in the IE experience, it is relevant to correlate this with the general concept of online education due to the obvious parallels. There is a wide body of research which examines the technical options to supporting online learning, including the ways in which technology can be applied, which can otherwise be referred to the pedagogy, or andragogy when applied to adults, of teaching.

5 Pedagogical Frameworks

Pedagogy describes the approach taken to teaching. It works on the way in which humans learn and seeks to exploit this through the teaching approach for maximum learning benefit. Pedagogical approaches have evolved over the years, to respond to new research findings, changing learner needs and modern tools which support T&L

experiences. Specific to our chapter, the pedagogy influences the reasons why technology can be incorporated into the educational experience. If there is a target group of students who are not experienced with technology, then advocating technology use may not be the most appropriate approach to ensure that an optimum T&L experience is facilitated. It may be that, however, if there is a drive to add technology into the pedagogical experience due to the unique benefits which it introduces, that additional technical support is provided, and increased monitoring of student satisfaction of their educational experience takes place throughout the teaching to ensure that technical challenges are not limiting their education. We therefore review relevant pedagogical frameworks with a view to appreciating the opportunities for integrating technologies into the educational experience.

Underpinning all pedagogies, nonetheless, involves one or more of a constructivist, inquiry-based, reflective, collaborative and integrative technique. With constructivism, learners are assumed to construct knowledge rather than passively absorb information. With constructivism, learning is considered to be an active process in which learners guide the way that they learn; they must be self-motivated to do so. In an inquiry-based approach, the student's inquiring skills, as with constructivism, are again the focus, and encouragement is placed on students to ask questions and be active in their learning. Reflective learning is based on the notion that we learn from our experiences and through reflecting on them. It is possible that this can lead to integrative learning, during which connections are made between concepts. This can involve making connections between past experiences and new learning to derive new knowledge and understanding. In more social approaches to teaching and learning, we find collaborative learning, during which peer-to-peer learning takes place, and social-cognitive learning, which involves modelling the behaviours of others to support learning and behaviour changes. In modern teaching and learning, differentiated learning strategies are popular, in recognition of the differences in individuals across a cohort and the notion of embracing each other through offering a personalised approach to teaching and learning (Smith et al., 1997).

Specific to the concept of entrepreneurship, the authors of (Figueiredo et al., 2014) define a framework to compare different teaching methodologies of entrepreneurship education and training (EET) interventions. Its dimensions include the following:

- (a) **Level of process orientation:** This involves considering entrepreneurship as consisting of different phases or processes that build on one another to produce the result of a well-functioning enterprise. Interventions with a high level of process orientation focus on multiple phases of entrepreneurship, whereas those with a low level of process orientation choose to focus on either one, two or a handful of specific phases of entrepreneurship. The authors believe that interventions with a high level of process orientation are more effective.
- (b) **Level of contact:** This is the extent to which EET participants are in contact with entrepreneurial experts. Low levels of contact involve teaching by university professors without practical experience in entrepreneurship, while a high level of

contact, by way of contrast, involves mentoring by seasoned entrepreneurs. The authors of (Figueiredo et al., 2014) believe that the level of contact has no consistent positive or negative effects on learning by entrepreneurs.

- (c) **Level of action-learning orientation:** This involves learners being proactive and executing a plan of action instead of being passive recipients of knowledge and only hypothesising how events will take place in a practical scenario. Action-learning approaches (Dey et al., 2020) involve the learner taking responsibility for their own actions and to develop and explore their own tasks by experimentation (Neck et al., 2014).
- (d) **Level of fidelity:** This involves learners applying their entrepreneurial knowledge in an environment that is either real or hypothetical. Low levels of fidelity involve students to come up with a business plan and to describe and explain how the plan is expected to work in the given setting. On the contrary, high levels of fidelity involve learners in conducting and leading an enterprise in a real setting with actual customers and real sales. The authors of (Figueiredo et al., 2014) believe that interventions with high levels of fidelity are more effective.

This framework advocates an EET methodology with a detailed process, higher contact with experts, more action-oriented and higher fidelity being considered to be more effective and, hence, better at imparting knowledge of international entrepreneurship. The extent to which each of these situations may be achieved is dependent on the opportunities which one has for immersion in the local entrepreneurial activity which, in the case of IE, can be difficult to achieve. Through this chapter, we seek to reinforce the opportunities that can be introduced through technology in improving, at a minimum, the level of contact, level of active-learning orientation and level of fidelity.

In terms of entrepreneurship teaching models, teaching can take place according to an action-based model or a more classroom-based approach. The classroom-based approach to IE education raises concerns, however, in that they are not enough to teach successful entrepreneurship due to the lack of practical experience (Neck et al., 2014). An action-based pedagogy, on the other hand, can work to overcome some of these limitations (Mukesh et al., 2020); however, it introduces the challenges of travelling to the remote location and immersion in the local culture, which can be particularly difficult when we are considering the tuition of younger students and their general safety and typical risks of becoming involved in such endeavours.

In another example of IE pedagogy, (Ananga & Biney, 2017) examines the effectiveness of a particular pedagogy in the face-to-face teaching and learning scenario to maximise student engagement with their international entrepreneurship education. Influencing their approaches to lessons, the authors survey students on their believed effectiveness of particular pedagogical approaches, with a view to adapting the running of the class in response. Students are asked their reasons for why they enrolled on a module and what they hope to get out of their learning experience. Interestingly, students in the class were particularly interested in learning about entrepreneurship, with only a minority in the class interested in starting their own business. After engaging with a pedagogy for a short time, students were then

asked to score the pedagogical approach. The information collected using this approach was then analysed using concept mapping. The pedagogical approaches considered range from ‘supporting and encouraging learning’, ‘encouraging discussion’, ‘fun and interactive’ and ‘encouraging contribution’, among others. It might be argued that there is little content here which relates specifically to the teaching of international entrepreneurship.

When we consider what students need in their IE educational experience, a student shadowing a person with entrepreneurial qualities in a social-cognitive approach may therefore be one mechanism to gain an impression of the knowledge, personality and traits of a successful entrepreneur. This approach may be difficult to sustain, however, and certainly becomes more difficult when working on an international basis and when there are a range of competing factors to consider, including home life.

6 Using Technology to Teach International Entrepreneurship

Recent advances in supporting remote education include the use of holograms. A hologram allows a shape to be transmitted and displayed in a location which is remote to its source. Holograms are not an entirely new technology; however, 3D holograms in a classroom are novel and are certainly less explored (most likely due to the costly barriers to their use). The authors of (Wu & Martin, 2018) report on a 3D holographic floating heart to support practical teaching in nursing education. This approach was found to enhance the teaching convenience, in the sense of not needing a physical heart to achieve the teaching and learning objectives, in addition to generating interest and motivation between students through this novel approach to teaching. In another example, the authors of (Ike, 2017) describe their use of holograms to visualise mechanical engineering parts. This approach was taken to respond to first year students having difficulty in translating 2D shapes into 3D versions, but found that this was effectively supported using holograms. In recognition of the fact that many students now use tablets, they were able to use these to generate 3D holograms of the equipment, helping to support their understanding of the model as they were learning to draw it. To the best of our knowledge, there are no equivalent studies on the use of holograms to support the teaching of IE. We consider this to be a significant gap in the ways in which the technology is being used, given the particular importance of awareness of the characteristics of remote cultures and its significance on the success of an IE opportunity and the ability for this otherwise to be conveyed using holographic technology without the need to travel to the remote location.

Augmented reality and virtual reality are other techniques to support teaching and learning. With AR, scenes accessible to a user through a digital device are supported using other sensory information, such as further digital information or sound. With

Ikea's mobile app, for example, it is possible to visualise a product in your home through your mobile device. Virtual reality, by way of contrast, provides a simulation type of environment and changes what a user is able to see.

It can be appreciated how each of these technologies can influence the effectiveness of T&L. The authors of Grosse & Behrman (1992) describe how VR prompts students in analysing problems such that they are driven to investigate approaches to resolving them. This could be thought to have particular benefits when exploring real-life scenarios involving people and exchanges. The reactions of others can be unexpected, and the gaming quality of VR can support the creation of such scenarios and the evaluation of student reactions.

When we consider the speed with which educational experiences have had to migrate to the online environment during the period of Covid-19, it has been possible to observe the particular challenges that have been experienced. It is relevant to draw learning from this – these educational experiences have not been entered into voluntarily, but rather have been forced as a consequence of need. It is therefore possible to correlate these experiences with the challenges that can be experienced if IE students are increasingly taught using online technologies. Challenges include the limited technical abilities of all participating online—the subjects which moved most easily to online education during Covid-19 included those studying computing subjects (Porter, 1990). In cases not directly related to Covid-19 but instead considered more generally, those without specific technical capabilities, on the other hand, can experience challenges, both in the student (Chang & Lai, 2018) and teaching roles (Weers & Gielnik, 2020). Where teachers are limited in their technical abilities, this limits the prowess of the teaching approach, when standard Microsoft PowerPoint slides may be used instead of real-time polls of experience, for example; this in itself impacts student satisfaction and potentially their learning. Therefore, while we promote the technical tools available to support online learning, we similarly do not underestimate the challenges of this as an approach.

7 Conclusions and Future Research Directions

Examining the teaching of IE from the perspective of exploiting technology becomes increasingly relevant in the world today, given the impacts observed recently from Covid-19 and the implications that this has had on educational experiences in general (Wang et al., 2017). An increasing move to the online educational world has become more common practice and has not been without its challenges when considered from the perspective of students who have not voluntarily moved online. Supporting these students requires more careful crafting in comparison to those who have chosen to study through online means (and even then, there is scope for improvement). At the beginning of the chapter, we reviewed the teaching methodologies of EET, which exist in the extent to process orientation, contact, action-learning orientation and fidelity. Where immersion in the local entrepreneurial

activity is limited due to the costs present or ability to travel, as two possible restrictions, technology can bring that remote opportunity closer. Indeed, the most modern state-of-the-art technologies, such as holographic use, can allow unique opportunities of being exposed to the local culture and the important role it plays in enabling a successful entrepreneurial activity. To date, however, technology is relatively underutilised in this regard and there are therefore many opportunities to exploit in supporting IE education from the technical perspective.

We recognise a significant limiter of technology use in IE education as being through the lack of specific technical expertise to realise the opportunities. In our future investigation, we therefore seek to consider the opportunities for interdisciplinary study between IE educationalists and technical specialists, such that these gaps in the educational experience can be overcome. We are also interested in the extent to which IE tutors and students are technically aware and enabled, such that the suggestions of integrating more technology to support IE pedagogy is a realistic endeavour.

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A Student-Run Business as a Construct for Entrepreneurship Education: Presenting the Exploratory Case Study “Culinary Coffee”



Carsten Leo Demming, Carsten Kortum, and Ralph Scheubrein

Abstract Management education with focus on entrepreneurship and innovation is becoming more important in an ever-increasing competitive business environment. In this chapter, we first analyze so-called student-run businesses as a construct for experiential learning in the field of entrepreneurship education. In the second part, we reflect on 6 years of experience in setting up and managing a student-run business, legally incorporated as a cooperative.

Keywords Student-Run Business · Experiential Learning · Case Study

1 Introduction

Entrepreneurial activities have a positive impact on society (e.g., economic growth, job creation, and sustainable innovation), which has led to a significant increase in interest in entrepreneurship education (Hameed & Irfan, 2019). Central to entrepreneurial success is a specific skill set and mindset that enables entrepreneurs to develop promising business ideas and successfully manage a company while operating in a highly uncertain environment (Bacigalupo et al., 2016). Entrepreneurship education ideally fosters such a mindset in students and provides them with skills that enable them to operate in an entrepreneurial environment (Plumly et al., 2008). Due to these competences associated with entrepreneurs (Bacigalupo et al., 2016), entrepreneurship education at universities often emphasizes active learning of students including innovative teaching formats like gamification (Hyams-Ssekasi & Taheri, 2022) or advanced technologies like simulations (Bhullar & Aggarwal, 2022). However, regardless of how sophisticated these teaching formats are, students are aware that they are in a learning situation and not in a real company where their actions and decisions have actual consequences for the company. This

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discrepancy raises the question of how real-world entrepreneurial skills can be better taught to students.

In this chapter, we address this problem in analyzing a yet underresearched construct that may promote entrepreneurship education by practical action and entrepreneurial responsibility in a real economic entity: a legally incorporated student-run business (hereafter: SRB). An SRB could be constructed as an experiential learning environment that provides a close link between classroom instruction and real-world economic situations (Reeve et al., 2014). Specifically for entrepreneurship education, an SRB seems to be an excellent complement to more common teaching formats such as case studies or project-based assignments conducted for a real company (Truman et al., 2017). In this context, this chapter aims to address the following research questions:

1. *Which are the features of SRBs relevant to entrepreneurship education?*
2. *Which are the design options for an SRB when created to complement an entrepreneurship curriculum?*
3. *How was the SRB “Culinary Coffee” constructed to support entrepreneurship education?*

In the first part of this chapter, we discuss SRBs as an approach to expose students to a real-world entrepreneurial ecosystem that emphasizes multidisciplinary skills and the opportunity to gain actual entrepreneurial experience already during their studies without excessive start-up effort or risk. Second, we provide an overview of different approaches to organizing an SRB, focusing on the legal form “cooperative.” In this part, we also discuss the advantages and disadvantages of student-run cooperatives compared to other teaching concepts. Third, we present the SRB “Culinary Coffee” as an exploratory case study to supplement entrepreneurship education.

To the best of our knowledge, this work is among the first to systematically analyze features and options for establishing an SRB for entrepreneurship education and is unique in that it includes a discussion of the legal form “cooperative” for SRBs.

2 Current State of Research and Practice on SRBs

2.1 *Characteristics of SRBs*

An SRB can be characterized as being a nonprofit or for-profit business where students run a set of real business processes. For-profit SRBs considered in this chapter are designed to generate profit margins above cost through the production and sale of products and/or services. The first for-profit SRBs were established at Cornell University in 1894 with the purpose of helping students pay for tuition (Student Agencies Inc., 2022). Historically, these SRBs were established primarily

without or only with loose relationship to the academic curriculum at universities (Student-Run Business Association, 2022).

From an educational perspective, SRBs provide a unique opportunity for students to assume responsibility and gain hands-on experience with the operation and management of a legal entity (Daly, 2001). Considering Kolb's classical theory of experiential learning (Kolb, 1984), an SRB provides concrete experiences, allows for reflective observation, calls for abstract concepts to solve business problems, and offers a sandbox for active experimentation. Studies like (Sherman et al., 2008) suggest that experiential learning seems to be more effective than classroom learning for students to develop entrepreneurial skills. Unlike experience-based approaches that merely simulate business activities, managing an SRB has real consequences, such as capital risk, and provides real business relationships with vendors, suppliers, customers, and financial institutions (Daly, 2001).

An SRB which is integrated into the curriculum of the university's degree program represents a teaching approach which allows students to engage in real entrepreneurial activities under "safe" conditions. Therefore, a curriculum-integrated SRB can be considered as an experiential teaching approach to entrepreneurship education, which is significantly different from other teaching approaches like the academic approach with theoretical classroom instruction or the vocational approach (Hannon, 2005; Heinonen & Hytti, 2010).

2.2 Comparing SRBs to Other Teaching Formats in Entrepreneurship Education

While there are various formats to teach entrepreneurial skills, in this section we evaluate SRBs in comparison to the widely used formats "classroom teaching" and "case studies." Classroom teaching is the most commonly used way of academic education. This is why also in entrepreneurship education many programs rely on this format. Here, students get to know the theoretical foundations of managing a business (for instance, accounting, finance, marketing, leadership) as well as theoretical knowledge of the competences needed for being a successful entrepreneur (Bacigalupo et al., 2016). However, we know from learning theory that teaching abstract concepts without application tend to lead to substandard learning outcomes, especially when it comes to applying that abstract knowledge in real-world contexts. Another prevalent way that educators use to teach is through the assignment of case studies. In these assignments, students or teams of students analyze a firm's key challenges in a given situation. After analysis, the participants of the assignment typically present their ideas and recommendations how the firm should proceed in that situation. Case studies are helpful for students to apply theoretical concepts to simplified business problems. However, they are not able to reflect all the complexity that business decisions typically exhibit, such as the enforceability of a decision. In addition, assignments such as case studies lack the crucial elements of real

business consequences and real relationships with other firms on the market (Bilimoria, 1998).

One of the most critical goals of entrepreneurship programs is to give the participants an academically rigorous learning experience that translates into real-world value. Robinson and Haynes point out that “there is a need to develop and test entrepreneurship theories, models, and methods that go beyond an academic interest by being applicable to both the practitioner and the educator” (Robinson & Haynes, 1991). In line with this thought, students should have the possibility as well as the motivation, driven by tangible outcomes, to apply and test their academic knowledge and skill set. It is evident that SRB as a teaching format is better able than traditional formats to test and apply theoretical knowledge (Hannon, 2005).

Traditional formats in entrepreneurship education address specific business topics, such as to focus on specific business functions one by one instead of providing a holistic view. This often means to neglect the intersections of business functions and issues related to them. However, we know that in real-world business these intersections are especially critical (Kirby, 2007). SRBs reflect the importance of interrelationships of skill areas in complex business problems including otherwise hard to teach social and cultural aspects of decision-making in businesses. By adopting an interdisciplinary perspective due to active participation in an SRB, students are better able to understand the problems that are relevant to managing a real company. Necessary skills areas typically encompass business plan writing, sales, marketing, leadership, technology, organization, strategy, accounting, business methods, and human resource management (Tonelli, 2021; Wierman et al., 2007). In addition, SRBs convey soft skills in negotiations, team building, persuasion, work ethics, leadership, decision-making, risk-taking, and communication (Plumly et al., 2008; Minch & Tabor, 2007; Reeve et al., 2014). SRBs are also typically open for cross-discipline collaboration (Podeschi, 2019) and offer students the opportunity to do their own research (Reeve et al., 2014).

Another driving element in entrepreneurship is to act autonomously and be decisive. This also requires being entitled to make crucial decisions in business contexts. While classroom teaching and case studies offer little degrees of freedom to make real business decisions, in SRB success and failure are possible in real life. The students have to make decisions on short-term daily operations and on long-term strategy. Thereby, they can learn critical skills for future careers hands-on with confidence and share learning in teams. In general, teamwork is the basis of learning in SRB and helps to disseminate existing knowledge between students. Older students can work as mentors for beginners (Truman et al., 2017).

As the final aspect discussed here, it should be noted that entrepreneurship education should convey the concepts of the field of entrepreneurship in a theoretically rigorous manner. While the acquisition and use of experiential knowledge is an important part of entrepreneurial learning (Gibb, 2007), experiential formats like SRBs may not be efficient in providing a basic understanding of the business functions and its theoretical foundations (Kirby, 2007). Thus, there is still the need for providing basic knowledge structures in classroom lectures and applying them in hypothetical case studies.

Table 1 Comparing teaching formats in entrepreneurship education (source: own illustration)

Format	Real-world experience	Holistic view of business	Autonomy of students	Theoretical rigor
SRB	High	High	High	Low
Case study	Medium	Medium	Medium	Medium
Classroom lecture	Low	Low	Low	High

Summarizing the aforementioned aspects, Table 1 depicts that SRBs allow higher levels of real-world value, a more holistic view and more autonomy than case studies or classroom lectures, but are inferior in teaching theoretical foundations. Also, it appears that none of the single formats performs well in all of the discussed criteria. Consequently, combining formats can lead to a more comprehensive learning experience that takes advantage of complementary strengths. It has to be emphasized that rather than offering only one format exclusively in a program, it seems to be especially fruitful to integrate several of the aforementioned formats in order to address all facets of entrepreneurship. Combining different formats is also valuable in a sense that an SRB's emphasis is mainly on how to run a company with established business processes but not as helpful for answering the question of how to initially develop a business model.

In conclusion, prior research has shown that it is particularly vital to combine classroom learning with “real-world learning” (Bilimoria, 1998). However, research is inconclusive on the question of whether “real-world learning” must always take place after a theoretical introduction or whether it can also be helpful to switch this order (Gibb, 2007).

2.3 *Business Areas of SRBs*

After focusing on the merits of SRBs in entrepreneurship education, it is worthwhile to analyze the typical areas of SRBs with regard to their fields of operation. It is remarkable that the range of products and services offered by SRBs is very wide and includes, for example, art cafés, art galleries, bicycle rentals, consulting, food delivery, internet service providers, laundry services, restaurants, retail stores, storage, technology consulting, theaters, and video production (Josiam et al., 2017; Minch & Tabor, 2007; Podeschi, 2019; Robinson et al., 2010; Tonelli, 2021; Truman et al., 2017; Wierman et al., 2007). Based on these examples, SRBs documented in literature generally appear to share the following common characteristics:

- Services or products that are easy to manufacture are offered, but no products which need a sophisticated manufacturing.
- Common, not highly innovative or specialized services or products are offered.

- Business models with low entry barriers to setting up the business are selected (no or little regulatory requirements, not capital intensive, short start-up phase).
- SRBs focus on personnel-intensive businesses.
- The documented business models rely on either general easy-to-learn skills or specific skills related to the field of study.

Like other firms, the activities of an SRB can be analyzed using Porter's classical value chain model, differentiating primary activities (inbound logistics, operations, outbound logistics, marketing and sales, service) and support activities (infrastructure, technological development, human resource management, procurement) (Porter, 1985). Considering these types of activities, an SRB might carry them out autonomously or use the infrastructure of its home university. For example, the financial system of the home university might be used by the SRB and administrative managers of the university may have the ultimate responsibility. In addition, a board might be responsible for compliance with university regulations and policies (Wierman et al., 2007). The more business activities are conducted by the home university, the easier it is to establish the SRB and the less effort is required to keep it running. The disadvantage, however, is that the fewer business functions the SRB has, the less comparable it is to a "real" company.

2.4 Cooperative as a Legal Form for SRBs

To approximate a "real" business closely, an SRB needs to be a legally incorporated entity. Becoming such a juridical person makes the SRB much more independent from its home university providing both benefits like higher decision autonomy but also obligations like payment of corporate taxes and reporting duties to stakeholders. In the process of incorporation, a legal type must be chosen for the SRB. The specifics of each legal type differ in various countries. The legal type determines, for example, the ownership (one or more persons), the constitution of the managing board, the personal liability (limited or unlimited), the taxation (personal tax, corporate tax, tax-exempt), minimum capital necessary, and reporting duties. Most of the companies worldwide, as well as the majority of start-ups, are organized as "limited liability companies" or corporates (Khurana et al., 2020). At first glance, this makes "limited liability companies" also especially suitable for SRBs to mimic a common form of real businesses as closely as possible. However, this legal form can also bring serious disadvantages, considering that the goals of an SRB and a real company are not completely the same. For a typical company, for example, high start-up costs and a limited and inflexible management and participation model are not problematic because there is a fairly stable group of founders and executives. In contrast, in an SRB, it may be beneficial to distribute responsibilities more evenly to achieve a higher level of engagement among participating students.

To address this fundamental requirement, we focus here on the legal-type "cooperative" due to its unique features. The International Cooperative Alliance

characterizes cooperatives in the following way (International Cooperative Alliance, 2022): “Cooperatives are people-centered enterprises jointly owned and democratically controlled by and for their members to realize their common economic, social and cultural needs and aspirations. As enterprises based on values and principles, they put fairness and equality first allowing people to create sustainable enterprises that generate long-term jobs and prosperity. Managed by producers, users or workers, cooperatives are run according to the ‘one member, one vote’ rule.” This characterization makes a cooperative an ideal candidate to set up an SRB for entrepreneurial education:

- A people-centered, democratically controlled cooperative means students involved can actually take on responsibility. In contrast to working for a standard corporation with its hierarchical structure, this should contribute to a higher level of engagement of the students.
- Common economic, social, and cultural needs of students can be met by creating an appropriate for-profit or nonprofit cooperative. In contrast, students often work in companies besides their studies just for the salary and without pursuing idealistic goals.
- A cooperative is designed to be long term and self-sustaining, which makes it an attractive legal form for an SRB. In contrast, a common objective in start-up culture is to grow a company as fast as possible to make a profit as soon as possible by selling it to an established big player in the respective market.

However, in comparison to a simple limited liability company, a cooperative has additional obligations which are enforced by law, including the following:

- The cooperative has to be a member of an auditing association which regularly checks the business and provides reports about the performance and compliance of the cooperation. One effect of this mandatory external audit is that it helps to avoid bankruptcy of cooperatives. However, this mandatory auditing is also an additional cost element.
- There has to be an annual general meeting to which all members are invited. At this meeting, the members must discharge the executive board as well as regularly elect the supervisory board, which in turn appoints the managing directors.

3 Methodology

After discussing the extant findings on SRBs from literature, this section briefly outlines the methodological approach used to address our research questions and to add to existing knowledge on SRB for entrepreneurship education. Given the complex nature of the problem and the authors' unique access to information concerning an existing SRB entitled “Culinary Coffee” that integrates in a higher education teaching environment, we decided to utilize this focal SRB for a single-case study. In general, case study research is a suitable methodological approach to

generate an in-depth, multifaceted understanding of a topic in its real-life context (Crowe et al., 2011). It is largely qualitative and focusses on analyzing or describing a phenomenon. Different types of case study design have been suggested that tackle different aims (Yin, 2014). Specifically, as the findings in the research area of SRB are scarce, an explorative approach seems appropriate to qualify and extend prior research.

Explorative case study research is an established research design in the social sciences (Merriam, 1988) and focuses on the factors that drive a phenomenon or subject of study (Yin, 2014). We combine this type of case study design with explanatory elements to explain presumed causal links outlined by our literature review. Therefore, our case study may serve as an example to derive insights into challenges and opportunities of SRBs as a construct to facilitate teaching entrepreneurial skills.

4 Exploratory Case “Culinary Coffee”

Considering the potential benefits of an SRB for entrepreneurship education at a higher education institution, two of the authors established “Culinary Coffee” for the Business Administration study program at the Baden-Wuerttemberg Cooperative State University, Heilbronn, in 2016. The following description of this SRB presents a reflection on the design decisions and the curricular integration into the study program.

4.1 Design Decisions for the Construction of the SRB

The first fundamental decision in establishing the SRB was to incorporate it in the legal form of a cooperative: “Culinary Coffee eG” (“eG” meaning “eingetragene Genossenschaft”). To make it easy for enrolled students to join the cooperative, the price for one share was set to only 20 EUR. Guaranteed by law, all members of a cooperative have the same voting rights even if they possess only one single share. In addition to the advantages and disadvantages noted above in Sect. 2.4, the students knowing that their work affects the results of their own company changes the students’ motivation drastically. All projects in the SRB are done in a much more serious and responsible way. For example, discussions about future projects are much closer to real-life discussions in a company because in the end someone of the same group will have to implement the project and will be responsible for its results.

The second fundamental decision was to establish an SRB which covers as many business functions as possible. Therefore, the SRB should not only provide some services but also include the production of tangible goods. In comparison to a service company, such an “industrial” company is typically part of a larger supply chain and needs to address various additional interesting business problems (for instance,

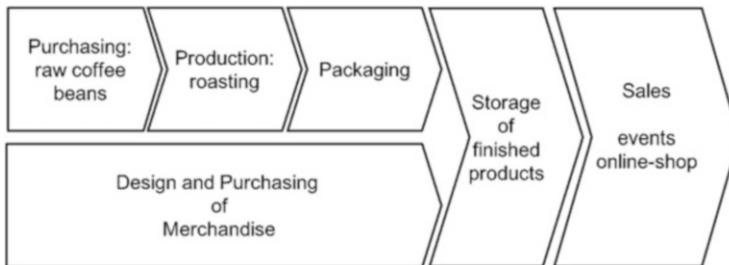


Fig. 1 Overall value chain of the SRB “Culinary Coffee eG” (source: own illustration)

supplier selection, raw material procurement, development of new products, logistics for raw materials and finished products, quality management, design, and improvement of the manufacturing process). As mentioned in Sect. 2.3, this meant identifying a product category that was relatively straightforward to manufacture, but also a product category that students, particularly the students with a major in Food Management, could relate to. After evaluating various alternatives, the decision was made to produce roasted coffee and to name the SRB “Culinary Coffee” accordingly. Roasted coffee is a product type fulfilling the typical features of a product offered by an SRB stated above in Sect. 2.3. Figure 1 depicts the resulting value chain with its single-stage production process. Over time, the product portfolio was expanded to include the procurement and sale of merchandise to provide experiential learning opportunities for students with the major in Commerce Management. Due to these design decisions, the overall complexity of the SRB’s operations is kept low, which should make it easier for students to get a holistic overview of the company.

Compared to a typical coffee roasting company, this SRB covers most primary activities (inbound logistics, operations, outbound logistics, marketing and sales, service) and support activities (infrastructure, technological development, human resource management, procurement) (see above in Sect. 2.3). However, the following aspects are notably different:

- Human resource management: all members working for the SRB are volunteering and receive no payments. This means aspects of work contracts, salary, social security, etc. are not directly addressed in the SRB.
- Infrastructure: due to its affiliation to the university, the SRB is allowed to use space on the university’s grounds for its operation. This means aspects of corporate real estate management are not addressed in the SRB.

The third fundamental decision was to make the SRB permanently available as a construct for entrepreneurship education, but not to grow the business beyond the minimum necessary. Therefore, the SRB does not have the typical business objective to increase profit over time but to provide just enough profit to compensate any unavoidable expenses like, for example, costs for registering trademarks, maintaining an online store, and paying tax consultants and lawyers. Also, there

are other coffee roasting companies in the immediate vicinity of the university and the intention of the SRB is not to take away any noticeable market share from them. After several successful years of operating the SRB, we are now optimistic that the sale of roasted coffee in the university environment will continue to generate the minimum required profit and not affect the local coffee roasters' market in a problematic way.

4.2 Curricular Integration of the SRB

Today, the SRB is available to the students on three levels:

1. Case studies based on real-world problems of the SRB.
2. Elective modules for “entrepreneurship”.
3. Active participation in the cooperative.

These three levels, explained in the following, differ in the number of students reached at the university and the extent to which students can train their entrepreneurial skills.

4.2.1 Level 1: Real-World Case Studies

Having all the data available from an actual company, the SRB, simplifies creating case studies close to reality. Because the SRB is a firm with most business functions, case studies can be created for a wide range of modules in the curriculum. These case studies also do not require much introduction, as the SRB value chain and products are deliberately kept simple. Two examples should illustrate this:

- Calculating the net present value of an investment project is a basic skill for all business students covered in courses like “Investment and Financing.” The SRB has investment opportunities all the time, e.g., deciding which roasting machine to buy next. For these machines there are actual quotes from vendors available. After these quotes have been anonymized to some degree to avoid disclosure of sensitive, proprietary personal information, these quotes can be shared essentially unchanged with the students tasked with identifying the best investment alternative.
- The SRB uses Instagram as a marketing channel. In a lecture about “Social Media Marketing,” the assignment is to create Instagram posts with photos, videos, hashtags, etc. matching the business communication and corporate image of the SRB.

Considering the same legal entity, the SRB, from different business perspectives in different modules of the study program, should help students gain a more comprehensive understanding of how a business functions as a whole. These SRB-related assignments reach a high percentage of business students at the

university, but entrepreneurial skills training in these standard curriculum modules is limited at this first level.

4.2.2 Level 2: Electives in the Third Study Year

In the third year of their studies, students can choose the elective “Business Foundation and Development” which was introduced in the study program in the accreditation in 2018. Since this elective consists of 100 contact hours and 10 ECTS credits, the content offered is broad and includes, among other topics, the following:

- Students develop a business idea and create a business plan for a subsidiary of the SRB which would be conceivable. This forces students to inform themselves about the specifics of that industry and to submit a realistic business proposal for that market.
- The student can choose to introduce a new product for the SRB. Such an innovation project includes a market analysis, designing the product, determining a product price that is acceptable to customers, manufacturing the product, and marketing the new product. Like in real life, sometimes these innovation projects fail, i.e., those groups have to deal with the experience of a “failure.” However, the grade is not directly related to the end result, i.e., whether the project is a financial success or a failure, but to the thoroughness with which the innovation process was carried out.
- During the elective, there is a workshop with alumni who founded a company after graduation. This workshop is always very well received by the students, probably because the students can easily identify with those graduates who have had a similar education at the university and are often not much older than they are.

In comparison to the case studies on the first level discussed above, only those students choosing this elective are reached. However, these are typically students who are self-motivated to train their entrepreneurial skills.

4.2.3 Level 3: Member of the Cooperative

Becoming a member and working in the cooperative while studying is an option only chosen by highly motivated students. However, these students can gather a lot of experience until they graduate after 3 years. To structure this experience, in the cooperative, “career paths” were defined leading to higher positions with higher responsibilities within the cooperative. Such a “career” might, for example, include the following positions:

- Freshman in the first year: coffee roasting, shipping.
- Junior in the second year: quality management, purchasing, accounting.

- Senior in the third year: supplier management, production management, human resources management, general management.

However, such a career is not automatic: the positions are publicly advertised and the students have to apply for them. Again, the number of students involved is smaller than on the previous level, but the opportunities for these students to gain entrepreneurial skills are comparable to working in a real business and having a steep career in 3 years.

5 Conclusion and Outlook

Using an SRB to teach entrepreneurial skills provides unique features other methods of instruction cannot offer. This chapter presents aspects of designing such a business to supplement entrepreneurship education and integrating it into the curriculum.

The experience of the authors, who have set up and managed a student-run business over the past 6 years, suggests that long-term funding and a product portfolio linked to the university's curriculum are critical for an SRB itself. Considering the students and their participation, the legal form of a cooperative with the possibility of becoming co-owners without major obstacles is extremely valuable for the motivation.

Future research can build on our exploratory case study in the yet underresearched area of student-led enterprises in Europe, in particular considering the features of a cooperative. From an educational perspective, the general question is the extent to which the experience a student gains working in a student-run business actually impacts his or her business career after graduation.

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Educating Entrepreneurship through Design



Jeroen Coelen and Frido E. H. M. Smulders

Abstract The early stage of new venture creation is highly undetermined, is high in uncertainty and requires action to progress. These characteristics overlap with the definition of what makes a problematic situation a design problem. In order to improve education for students to deal with this type of problem, this chapter builds on the paradigm of ‘through’ education and the new venture creation approach. It proposes a new paradigm, ‘entrepreneurship education through design’ with a strong focus dealing with design problems via designerly behaviour. This chapter highlights the design theoretical basis of this paradigm and shows how the course setup can contribute for students to display designerly behaviour, reduce uncertainty and ultimately successfully incubate new ventures.

Keywords Design · Entrepreneurship · Entrepreneurship education · Design problems · New venture creation

1 Introduction

Entrepreneurship is dominantly (83%) taught via two approaches, ‘about’ and ‘for’ (Pittaway & Edwards, 2012). In ‘about’ education, the most traditional format, the students get codified knowledge on entrepreneurship such as entrepreneurship theories and are tasked to reproduce it in a test. In ‘for’ entrepreneurship, students get simulated entrepreneurial tasks, such as the writing of a business plan and/or case studies. Where the goal of entrepreneurship education is the acquisition of true entrepreneurial skills, the third approach called ‘through’ education has become more popular. Here the course is designed so that the students engage in actual entrepreneurial behaviour, not only analysing and planning, but going out and acting on the ideas. As a result of this recent attention to ‘through’ education, experiential learning (Kolb, 1984) has become an upcoming learning philosophy in

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entrepreneurship education (Lackéus, 2020; Baggen et al., 2021). A popular vehicle for this type of ‘through’ education is the venture creation approach, where a combination of education and incubation happens (Ollila & Middleton, 2011). Here, not only do the students learn through entrepreneurship, they also build real ventures, as they engage with the real world and not with a simulation, as ‘through’ as one could get. The ventures from courses like this can sustain after said courses and, for instance, join university incubators after the students graduate.

It sounds simple, but it is not. If we want to teach our students ‘how to start a new venture’, we should ask ourselves what the start of a new venture is like. We know that new venture creation is a process that is chaotic, complex and idiosyncratic for a variety of reasons. Firstly, entrepreneurship is contextual (Welter, 2011; Zahra et al., 2014), as in the variety in external forces that work on each start-up. Furthermore, the composition of the start-up, such the team’s capabilities and their resources, varies per team, let alone which idea or opportunity they are pursuing and the market they aim at. This implies that what works for one team might not work for the other. Secondly, the process is riddled with uncertainty. Goals and processes are unclear and ambiguous. For each moment in the process, it is impossible to assess what information is truly relevant or have full certainty on what steps need to be taken. Next to that we cannot predict the future (Knightian uncertainty). Sarasvathy et al (2008) conclude that all these uncertainties allow the early stage of entrepreneurship to be characterised as a design problem, problems that are in part undetermined or ill-defined requiring action to solve them (Dorst, 2004). This observation made us choosing design theoretical principles as the basis of our teaching approach, hence the title of this chapter, educating entrepreneurship through design.

In this chapter we give you our position on entrepreneurship education that we have named after research as ‘entrepreneurship through design’ (van Oorschot, 2018). Firstly, we will focus on what the start of a new venture is about and what it entails if we are to see this as a design problem. From there we move to describe design theoretical perspectives by addressing the application and education of designerly behaviour as a prerequisite of our approach. This is followed by the practical implications of this approach in the course setup that enables designerly behaviour, combined with some illustrative examples from a course taught in this way.

2 Entrepreneurship as a Design Problem

At the start of any entrepreneurial journey, it is widely accepted that it can go in many directions. Upfront, it is extremely hard to tell which precise direction a venture will go. At the start of such a journey, a lot needs to be figured out. One of the key elements is to figure out what needs to be figured out. This is a layman’s way of explaining what a design problem is. Design problems are problems that are undetermined. This does not mean that there is complete freedom to what the problem is, but the biggest part of the problem is undetermined (Dorst, 2004). Part

of the design process is getting to the (re)defined problem, as illustrated in many design process descriptions such as Design Council's double diamond (Design Council, 2007). Design problems sometimes are called wicked problems (Rittel & Webber, 1973), ill-defined problems (Maher et al., 1996) or ill-structured (Simon, 1973). In the end it seems that, theoretically speaking, design problems are hard to define (Dorst, 2006), but what they have in common is unclarity, undeterminedness and an interaction as a requirement for solving the design problem. The latter can be explained with this metaphor: Imagine finding yourself deep in a cave, with just a flashlight. Assume you want to leave that cave. You point your flashlight around and you discover three tunnels. The flashlight only allows you to see part of your current context; you do not have a map of the entire cave system. Without going into any of the tunnels, you cannot find your way out of the cave. This is what makes design problems require action for solving. You need to engage with and in a situation to solve the problem.

This is what we find in the early stage of entrepreneurship: high unclarity, high uncertainty and a requirement of action. Therefore, the early stage of entrepreneurship can be seen as a design problem (Sarasvathy et al., 2008). As stated before, entrepreneurship is highly dependent on the situation. To understand what the situated design problems of entrepreneurship are, we should look at how the designer (in our case entrepreneur) approaches the problematic situation (Dorst, 2004). The entrepreneur aims to break down the problematic situation and pick a way forward from the way he makes sense of that situation. To break open these undetermined problems, one needs to interact with the situation. This explains why 'through' education and not 'for' and 'about' education is most suited for letting students experience entrepreneurship by doing. However, there are no pre-defined paths of interaction to arrive at a solution from a design problem that the early stage of entrepreneurship entails. We call this fluid process design. The outcome of design is an interpretation to a problematic situation and potentially a solution to it. In other words, design processes move uncertainty towards more certainty; this goes for entrepreneurial contexts too (Berglund et al., 2020). Thus, design activities are seen as a way to deal with the uncertain fuzzy front end of entrepreneurship (Nielsen et al., 2017). In this early stage, the activities are not only characterised as design, yet also as effectual logic (Reyment et al., 2015). Effectual logic also is seen as a mitigator of uncertainty (Mansoori & Lackéus, 2020; Klenner et al., 2022), which seems to have strong relationship with design (thinking). In recognition of the uncertainty of the early stages of this process, design (thinking) has become a rising method within entrepreneurship education (Daniel, 2016; Sarooghi et al., 2019; Linton & Klinton, 2019).

However, design thinking (DT) and design are not the same thing. Design thinking is often referred to as the user-centred multistep solution generation method, dominantly the model proposed by Stanford D. School, or related variants (Sarooghi et al., 2019). Although more steps exist than ideation, within entrepreneurship education, DT is often reduced to ideation and focused solely on the creation of problem solution combinations in the shape of products or services (Sarooghi et al., 2019) and by that excluding a wider perspective of the new venture

beyond its product or service offering. Later we will refer to this holistic output of the entrepreneurial design process as the venture concept (Dimov, 2021). We see that DT is often taught as a linear process with limited cycles (Linton & Klinton, 2019) and lacks deep holistic cycles that include the interaction between designers and non-designers outside the ‘discover/empathize/understand’ phase. This reduces DT to a creative innovation method that creates product or service concepts and misses out on the integrated but still conceptual version of the whole venture. This comes to questions entailing elements from a target customer to a business model, from pricing to suppliers and from marketing channels to branding to financial models, to name a few (Afuah & Tucci, 2003; Osterwalder, 2004; Coelen & Smulders, 2020).

While interacting with the problematic situation, the entrepreneur slowly builds up a picture of the current situation and an idea of the ultimate venture, the venture concept (Dimov, 2021; Vogel, 2017). This venture concept is abstract and uncertain at the start of the journey. It is not clear from the start which elements reside within the venture concept and which of the many elements in the venture concept will require attention, if they require any attention at all. Such is only possible by interaction with the problem or the situation (market) in which the problem is believed to be found. Ultimately, student entrepreneurs aim to seek a profitable business opportunity by making satisfactory connection between a suboptimal market situation and a potential value proposition that aims to improve that situation. Navigating this fog is a cumbersome process and goes by trial and error, moving back and forth. If we wish to educate our students as entrepreneurs, we should equip them with the skills, behaviour and mindset to mitigate this early-stage entrepreneurial design problem.

This brings us to design, not the opposite to design thinking but a broader, less defined set of activities and mindsets. This includes designerly thinking (Cross, 2001; Cross, 1982) (which is not similar to design thinking (Laursen & Haase, 2019)) and design(erly) (inter)acting (Smulders & Subrahmanian, 2010). Designerly thinking is a discipline with abductive reasoning, design problems and contextual meaning making at its core, via approaches such as reflective practice and co-evolution of the problem and solution (Laursen & Haase, 2019). Design acting does not refer to the design activities such as sketching or model making, yet includes the social activities in relationship to non-designers. In our case, this would be the social activities of the entrepreneur in relation to external stakeholders such as customers and suppliers to ultimately create the change the entrepreneur envisions. In the remainder we will merge designerly thinking and designerly acting into designerly behaviour. If one is to focus entrepreneurship education at this fuzzy front end of the new venture creation process, we believe the courses should be set up to deal with the situation as a holistic design problem. For that purpose, we propose *educating entrepreneurship through design* as a didactic format. In the next section, we will explain what designerly behaviour entails in an entrepreneurial context.

3 Educating Entrepreneurship through Design

Now, we turn to our teaching practice. We have educated *entrepreneurship through design* for 10 years. In this section we explain designerly behaviour and some of its theoretical foundations. In the subsequent section, we will focus on our course and explain what elements of the course setup enable students to display designerly behaviour in an entrepreneurial setting.

3.1 Educating Designerly Behaviour

Designerly thinking and designerly acting, together designerly behaviour, cannot be taught from the book because we believe it is a tacit capability acquired in practice. At the Faculty of Industrial Design Engineering at Delft University of Technology, this tacit way of thinking and acting is educated by repeated experiential learning cycles (Kolb, 1984) in design challenges combined with a holistic theoretical base that moves beyond design theory only. Our school is well known for its strong research base in the domain of design practice as well as having a strong base (research and education) of the contributing domains like engineering, psychology, anthropology, economics, marketing and management. From the inception of the school in the late 1960s, the dominant focus of our school was on product innovation from strategy till use of the new product in the market (Roozenburg & Eekels, 1995). The above-mentioned multidisciplinary knowledge base finds its way to the students by means of theory classes as well as hands-on design projects that call for a holistic approach. These projects, in the form of challenge-based learning (Johnson et al., 2009), call for pragmatic integrations of the theory by students to arrive at resolution of the design challenges offered to them.

Based on the staged approach of product innovation activities, Smulders (2014; Smulders & Dunne, 2017) showed that the design as well as the engineering activities has a heterogenous character, meaning that design and engineering as human activities are not just applied to the product, but equally to all the other elements of a full-blown product innovation process (production, branding, marketing and sales, etc.). At some point it was realized that the holistic approach of product innovation as taught in our school could equally be of value for the design of the building blocks belonging to the venture concept as introduced by Vogel (Vogel, 2017). Building on these thoughts we started experimenting with entrepreneurship education ‘through design’. The students that follow our course are used to designerly thinking and (inter-) acting, but here are asked to apply these capabilities in a new context, that of designing a new venture concept. In the next two sections we will address some key ingredients from a design theoretical perspective.

3.2 Exploring the Situation through Reflective Conversation

Within our faculty, design as a reflective conversation (Schön, 1983) with and in the situation forms the dominant educational paradigm. Donald Schön (1983) coined this as a reaction on the dominant rational analytic way of problem-solving. Schön identified a type of rationality when analysing a variety of craft workers, such as doctors and architects. What these professions have in common is that the actors encounter new situations which do not have precise and predefined answers. The architect, in a reflective conversation with himself/herself, investigates the results of adding lines to a sketch. The sketch talks back, and he/she investigates permanently if the sketching actions improve the overall design. Reflections happen ‘in-action’ while sketching, or ‘on-action’ after a sketch. In this way, the architect learns about the solutions and the (problem) situation at hand. Perhaps he/she should adjust his/her view on the problem, a so-called reframe (Dorst, 2015) of the situation. Making a sketch in this case could be seen as an experiment. Designerly actions are to be seen as experiments that enable the reflective conversation with the situation that in parallel creates deeper understanding of situation and potential solutions.

Let us translate this to entrepreneurship education. The entrepreneur who immerses himself/herself in the market situation to do research there will experience through his/her inquiry that the situation talks back, as it were. We see that every interaction of the student entrepreneur with stakeholders in the market brings new information, to reflect on. Furthermore, when designing a business model, the conceptual model equally talks back. It is this reflexivity that is key for mitigating uncertainty of the fuzzy front end of the venture creation process. It ties in with Kolb’s experiential model of learning, where reflective observation fuels the thinking that creates abstract conceptualisations, i.e., understanding of the situation. These abstract conceptualisations in its turn fuel action of which the results can be observed again (Kolb, 1984). Kolb and Schön both share a pragmatic philosophical background, where a key component is the epistemology of the designer (Dixon, 2020). This links back to design problems. Design problems are problems about which we do not have full information. This undeterminedness of design problems is partly epistemic, and an experiential episteme is what helps to build up understanding of the situation via this reflexivity.

3.3 Co-Evolution of Problem and Solution Spaces

A designer observes or senses an existing suboptimal situation. The current situation, external to the designer, is seen as the space that potentially holds a problem worth solving, the problem space in which problems ‘live’ (Maher et al., 1996; Dorst & Cross, 2001). Problems can and most likely will be implicit or latent, meaning not well-defined, if any form is defined at all. This space forms the context and provides constraints and requirements for the solution. The current situation is something that

at the start of the process is high in uncertainty: designers do not fully understand it and do not know whether the suboptimal situation has a solvable problem. How does the suboptimal situation manifest itself? Which actors are relevant and potential users? What are the driving forces among key actors? Why is the situation like it is today? All these questions relate to the problem space. By submersing the designer in the problem space, via design acting and reflective practice, the picture gets clearer. From this clearer picture, the designers open a solution space by imagining possible solutions. The mitigation of uncertainty happens through designerly behaviour within both the problem and solution space. This does not only happen via the reflective conversation, yet also by a co-evolutionary¹ process where the understanding of both spaces feeds each other. Spending time in the solution space feeds the understanding of the problem space and vice versa. Design research found that designers oscillate between the problem and solution space (Dorst & Cross, 2001) to come to the final solution. This interplay continues in cycles until a satisfactory fit between problem and solution has been reached. Co-evolution is seen from the perspective of a creative designer. However, often the problem space is not owned by the designer himself which introduces another key actor in the design process. For instance, Smulders et al. (2009) looked at the interplay between an architect and the client in the case of the design of a new crematorium. The client being the knowledge partner about the operations in the present building is holding all knowledge about the (potential) operational problems that could occur in a new building. The architect, on the other hand, owns the solution space in which deliberations and thoughts pass by on possible solutions for the new building. Criteria for choosing one option above another are in the architect's head (Dorst, 1997). Meaning, both partners hold implicitly parts of the problem and solutions spaces, respectively. The only way out here is through synchronizing these two diverse mental systems by designerly interactions (Smulders et al., 2008) in which problem and solution spaces co-evolve during the interactions (Smulders et al., 2009).

For the student entrepreneur we see a similar situation. The stakeholders in the marketplace, the situation for the entrepreneur's inquiring, own the problem space with implicit and latent problems. The student entrepreneur as a designer of the new proposition holds the potentialities related to the solution space. Again, only by immersing in the situation including frequent designerly interactions, the problem and solution spaces co-evolve until there is a promising match. It therefore not just becomes a reflective conversation with the situation, but more accurate a reflective conversation with key stakeholders.

¹For more reading on co-evolution, Crilly (Crilly, 2021a; Crilly, 2021b) offers an extensive overview and critique.

4 A Course that Enables Designerly Behaviour

To enable designerly behaviour, we designed Build Your Startup (BYS), a masters elective of 15 ECTs. It spans 1 semester (18 weeks), where students work for 2.5 days per week on their start-up. The group size per venture idea is a minimum of two students and each batch contains around 8 start-ups. The students most commonly bring B2C ideas, but B2B or B2B2C ideas are not uncommon. One day is reserved for 1-1 mentoring, workshops on relevant theories, skills and frameworks including guest lectures by experienced entrepreneurs. In the remaining days, students are urged to ***build their start-up***, by executing on their ideas discussed in the mentoring sessions.

4.1 *Mentors to Help the Reflective Conversations*

In the weekly mentoring sessions of 30 minutes, two experienced mentors (ex-entrepreneurs) help the students to interpret the situation. These are dialogical conversations, where the mentors bring an external view to the situation and are not directive, only suggestive as they think along with the students (Knight, 2017). The mentors help to clarify uncertain elements of the problem space, solution space and overall venture concept, along the lines of active mentoring focusing on the inquiry by the students. Here, they reflect on action (Schön, 1983) of the students, which allows for adjustments of goals, spontaneity, new themes and discussions and disagreement on strategy to emerge (van Oorschot, 2018) to refine the approach of the students. Besides discussing the past activities, the mentors help the students by connecting them with alumni of the course and their own network to broaden their community of inquiry (Shepherd et al., 2020). There are two fixed mentors that alternate each week between half of the groups. We have experimented with the weekly guest lecturers to additionally act as a mentor. This has benefits yet also downsides. The benefit is that students need to re-explain their start-up each week, refining their concept. The outside mentor would mitigate the bias from the two mentors and allow for new perspectives. However, having a completely new mentor each week is somewhat time-consuming; the guest speaker as mentor needs to get acquainted and create some deeper understanding of the student's venture. External mentors do not know what the team discussed last week or the week prior. For this they are less likely to call out the student's lack of action, something the fixed mentors can easily do. Furthermore, these fixed mentors, since they are up to speed, can dive deeper into the venture concept and their approach. Although the new perspectives are important, we prioritise pace and depth over this and nudge students to get new perspectives via their community of inquiry.

4.1.1 Example of the Deepening Mentor Role

In one situation, a start-up had talked with various potential users. They identified them as potential customers, a reflection on their action. However, for the mentor it seemed unclear if these users were the people that were going to pay for the solution. The mentor suggested that ultimately, for the venture to emerge and be profitable, this requirement needs addressing. This did not occur yet to the team. Subsequently, this sprouted a discussion on potential stakeholders that might have an interest and money to solve the problem. Two weeks later they executed on this challenge by talking to more customers and figuring out who would be their paying customer.

4.2 *Out of the Building to Reduce Uncertainty*

All start-ups in the course start out with an idea of a problem space. Very often, this problem space is broad, undetermined and high in uncertainty, such as ‘something with food and sustainability’ or ‘current dating apps suck’. To make these problem spaces less broad, we enable our students to act designerly. In the first weeks of the course, the homework for each group member is ‘Talk to 5 customers’, the so-called ‘get out of the building’ mentality (Blank & Dorf, 2020). In that week, students get a workshop on ‘talking to humans’ with a focus on open conversations that do not focus on solution validation. This forces the students to build their understanding of the problem space, grounded in the experience of the customer. In our latest batch, 11 start-ups engaged with over 1200 customers and stakeholders over the course of 18 weeks. That is an average of 6 customers per week, enabling to continuously sharpen the understanding of the problem space. It is not only the problem space that gets explored. As designers are used to conceptualising solutions, many scattered ideas will surface in the first weeks. When the mentors sense that one solution is certain enough, they urge the students to do a validation experiment. Again, they need to go out of the building to generate evidence that their solution is truly valuable to the customer.

4.2.1 Example of Mitigating Solution Uncertainty

A recent team had the idea of a vinyl subscription service. After exploring the problem space by talking to customers they arrive at a solution, basically, Spotify’s Discover Weekly, but for vinyl. That sounds great, but what next? The team did not know how to act, if to act. Talking to customers would not reveal new information. They did not realise they had mitigated enough uncertainty to execute on this solution. The mentor was able to see that the solution idea was concrete enough to experiment with. Therefore, the mentor urged them to try to sell this solution to 10 people. See if that works, if it sticks. With that little push, they suddenly became

extremely active. Within a week, they launched a pre-order website, and the first pre-orders came in. This lack of execution on a designed solution is something that occurs often in the course. We attribute this to the conceptual nature of most design courses in our school where the output is a product concept. It is this what students tell us they value about our course, the fact that you actually sell your solution.

4.3 *Holistic Workshops*

To enable the holistic development of a venture concept, workshops on relevant elements are giving throughout the 18 weeks. After a couple of weeks in the problem space, a value proposition workshop is given, followed by a business model workshop. In this way, students can experience the interrelatedness of all the elements of a venture. For instance, they experience the implications of their solution idea on the revenue model. The first quarter focuses on elementary stuff, such as making sure that the solution production price is not higher than the customer acquisition costs and the production costs. In the second quarter, a more detailed financial model is made for 12 to 24 months. In this way, students can calculate how many customers they would require making a living out of this start-up. They can use this to craft a marketing plan and run experiments on the effectiveness of each acquisition channel. In this way, students design their venture holistically, eventually arriving at what we like to call a ‘rounded start-up concept’, which means well-balanced reduction of uncertainty across the many elements of a start-up.

4.4 *Deliverables and Assessment*

BYS is a pass/fail course without grades. We do not have a guiding framework or canvas we show to our students at the start. Yet, we felt we wanted to capture the evidence generated by the students. We have experimented with creating our own canvas over two batches, as we felt the Business Model Canvas (Osterwalder, 2004) and lean canvas by Ash Maurya (Maurya, 2016) did not have the answers us educators found important. A key focus of our canvas was evidence; exemplary blocks were ‘proof of willingness to pay’ and ‘value as reported by customer’. After two semesters, we experienced the canvas became more of an end rather than a means. Instead of having the canvas throughout the course, students are required to make an evidence slide deck at the end of each quarter. Here, they have one slide to put all evidence generated for each of the blocks, such as problem statement, job to be done, unit economics and business model. This evidence deck, combined with a regular pitch deck of a physically given pitch, makes up the team deliverables. The lack of guidance of explicit building blocks forces students to develop their own understanding of what is relevant and important. Combined with the implicit frameworks of the mentors, students are more challenged to develop their own

ideas. In a personal reflection, we ask students to engage with an article on ‘Top 20 Reasons Startups Fail’ (CB Insights, 2019), an idea adapted from a fellow entrepreneurship educator. We ask the students to reflect which of these reasons are apparent in their start-up and what to do to mitigate them. Furthermore, we ask them to add 1–3 reasons to this list, highlighting their own experience and synthesis of what makes building a start-up complicated. Also, we ask for five key learnings written in a blog post format. Throughout the 18 weeks we ensure that their learning is sufficient, and we reflect with them on the course in a debriefing evaluation.

5 Incubation through Design

The new venture creation approach is a combination of ‘through’ education and incubation (Ollila & Middleton, 2011). We believe the designerly behaviour of our students in this course contributes to educating of entrepreneurial behaviour in a truly entrepreneurial setting, as the students display entrepreneurial, designerly behaviour. Furthermore, we believe that designerly behaviour creates venture concepts that have a high fit in the market. The continuous immersing in the situation via the means of conversations, prototypes and other experiments leads to development of solutions that are desirable. In the latest batch (Fall, 2021), 8 out of 11 start-ups already achieved pre-orders within the first 8 weeks, and 100% of start-ups had sales/pre-orders by the end of the course. At that point, 5 out of 11 start-ups were able to realise actual revenue in bank with customers using the first versions of the solutions. That means turning an existing situation into a changed one by adding a new solution, generating and capturing value via a business model. They developed a venture concept that probably still has uncertainties, but at least much less than at the start. Over the decade-long existence of Build Your Startup, 105 start-ups were founded. In a 2021 survey executed by our teaching assistant, we discovered that 23 of these start-ups were still in operation (22% survival rate). This shows, for us, that designerly behaviour in the early stages of the new venture creation process not only allows to train entrepreneurs, yet also allows for real ventures to incubate. The course resonates well with students. In 2022, the course received ‘the most inspiring masters elective’ award as voted by all masters students and scores in the upper percentiles with 8.6 out of 10. We believe it is really ‘through design’ entrepreneurship as a student once summed up ‘the only course where the one to bullshit is yourself’.

6 Future Areas of Development

For developing ‘entrepreneurship through design’ education further, we should gather and compare existing ‘through entrepreneurship’ courses to see how many of these already have design components and compare the effects on the process. We

have experience with predominantly (90%) design students; however, we would like to see how our course setup fares with students from other types of education, such as business and engineering. Furthermore, it would be interesting to compare these types of courses to incubator/accelerator programs and see what these programs can learn from each other. If you wish to adopt our ‘through design’ approach, it is important to understand that creating a venture takes time. Being able to work on the start-up for 18 weeks contributes hugely to their learning experience. This allows for teams at all paces to experience what it is like to get traction (or to get none of it). On top of that, the 2.5 days per week enable actual venture building. Students need time to get out of the building and to anticipate and plan to get out of the building. If you reduce the time available to 1 day, students are likely to start focusing more on the deliverables rather than designerly acting. For teachers, the workload is relatively high per student. The 30-minute mentor session plays a big part in that, while we believe it brings a lot of value, it makes a course like this harder to scale to triple-digit student numbers (our current max is ±35). For the students, one of the key challenges of this type of course is motivation. If motivation drops, the entrepreneurial intent is gone; there is no entrepreneurship (McMullen & Dimov, 2013).

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Future Proof: Hackathons as Occasions to Experience Entrepreneurial Thinking



Sabrina C. Eimler and Carolin Straßmann

Abstract The pandemic has opened up room for a creative reinvention of traditional teaching and learning formats making entrepreneurial skills, as, e.g., described in the EntreComp framework, a more pronounced part of the curriculum. As part of the course “Positive Computing and Diversity in Human Computer Interaction,” which is offered to students of different study programs within the computer science department, a (coding-free) two-day online hackathon was organized as an occasion to experience and strengthen entrepreneurial skills. Two major goals were pursued with the work documented in this chapter: (a) providing students with an intense, challenging hands-on experience of different facets of their own entrepreneurial potential, and (b) describing example hackathon events regarding the content, technical and organizational structure as recommendation for practitioners. Consequently, besides outlining a pilot hackathon, the chapter describes essential elements of the course, in which the hackathon was embedded, and content as well as didactic orchestration of both, the course and the hackathon. Evaluation data from two hackathon rounds are presented and taken up in a discussion and reflection.

Keywords Hackathon · 21st century skills · EntreComp · Higher education · Sustainable development goals · SDGs · Online learning · Innovation · Diversity

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1 Introduction

University education in STEM fields, such as computer science, still often follows traditional formats and practices. Regularly it does not cover or foster important entrepreneurial skills like those comprehensively described in the EntreComp framework (European Commission, 2018), a European framework aiming to foster understanding and spread of entrepreneurship among citizens and organizations. EntreComp harmonizes different concepts of entrepreneurship and describes three competence areas (ideas and opportunities, resources, into action) with 15 entrepreneurial competences, attitudes or knowledge domains (learning through experience, working with others, creativity, vision, coping with uncertainty/risk, self-awareness, self-efficacy, etc.).

More familiar in the teaching context, though also often not considered, is the concept of twenty-first-century skills (World Economic Forum, 2016). Looked at more closely, this skill set has a lot of overlaps with skills discussed as important in entrepreneurship. Apart from basic economic skills, training creativity, familiarity with future trends, diversity and intercultural sensitivity, pitching, rooting one's ideas in science, (virtual) group collaboration, and working under pressure or identifying where a group has gaps in knowledge and needs expert advice are important skills to be trained in a sustainable education concept, laying foundations also for the creation of innovation and building a lasting business.

The pandemic has opened up room to challenge traditional ways of teaching and paved the way for totally new and different forms of digitally supported learning experience able to address the abovementioned topics and skills. The dynamic and rapidly changing circumstances have also created room for experiments and “outside the box” learning and teaching experience that are now on the test bench for a long-term implementation in curricula. We believe that (coding-free) hackathons are a way to allow students to discover and experience facets of an entrepreneurial mindset and activate essential elements of their twenty-first-century skill set.

Often hackathons are organized by companies as extracurricular activities in the “war for talents.” They are especially used to train specific skills, like programming skills (Awuni Kolog et al., 2016). However, due to the challenge-based learning approach of hackathons (Gama et al., 2018), they are an ideal occasion at which students can enrich their soft skills (e.g., thinking collaboratively or creativity; (Awuni Kolog et al., 2016)). Gama et al. (Gama et al., 2018) showed that hackathons are a valid teaching method in which time constraints as a structuring element can help students in idea generation, sorting, and prioritizing as well as with timely solution development.

The findings of Gama et al. (Gama et al., 2018) also emphasize the role of the teachers involved and the conceptual setup of the hackathon. In order to train skills and mindset, it is important to give students (or hackathon participants, respectively) enough freedom with regard to methods and approaches applied in their collaborative work. The challenge is to be present as a teaching person and assist whenever help is needed while letting the groups gain their own experiences. In this chapter we aim to show a best practice example of how students can experience multiple facets

of skills that are described in the EntreComp (European Commission, Joint Research Centre, et al., 2018) and twenty-first-century skill sets (World Economic Forum, 2016), meeting the sweet spot of making them use, experience, and develop their competence, providing assistance and challenging them.

The chapter covers insights from two rounds of an 8-week course each concluding with a two-day high-density hackathon. Besides the description and evaluation of a pilot hackathon as an initial inspiration, the chapter covers the framing course and the hackathon providing insights into content, concept, and didactics, digital tools, and an analysis of data collected from students reflecting on the experience as well as lessons learned for future implementations.

2 Pilot: #Semesterhack

Due to the pandemic, learning formats needed to be substantially changed and, more than ever, became socially relevant. As a mere switching of lectures, projects, and seminars from face-to-face to online formats was not considered productive, we decided to try a new way of teaching students and, in line with an entrepreneurial mindset of the teachers' side, to explore this new space of opportunities. An online course was set up, covering future trends (e.g., diversity, AI, positive computing, social robotics) inspired by, e.g., the Future of Jobs Report released by the World Economic Forum, using a mixture of synchronous (workshops, online lectures, expert inputs) and asynchronous formats (videotaped talks, TED talks, quizzes, reading material) as a preparation to take part in the hackathon. With the #Semesterhack, the Hochschulforum Digitalisierung, the German Academic Exchange Service, and the AI Campus called for a joint event in which solutions for studying and teaching in the digital summer semester were to be found in 36 hours. A solution was to be designed able to create mutual awareness among teachers and learners and promote the feeling of being competent, autonomous, and related (as predictors of well-being) in order to guarantee a successful semester for everyone. Students worked in three groups presenting different solutions: (1) The Awareness Aquarium represents participants of a learning environment as fish equipped with several awareness features covering personal traits but also technical details about participants. (2) InTREegration uses a forest to create awareness. Students are growing from small plants to knowledgeable trees with information boards in the trunk, providing personal and status information. Teachers are forest animals. (3) The Awareness Classroom is dedicated to live reactions, i.e., (mostly) emotional reactions to the current content of an event. Clapping, hearts, sad, or happy emojis fly across the screen (which is meanwhile standard, but was not at that time). Feedback collected from the participants ($N = 13$) in an online survey showed a positive evaluation regarding the overall experience ($M = 4.38$, $SD = 0.06$; max. 5, assessed using a Kunin scale with five faces from frowning to smiling), flow (Rheinberg et al., 2003) as a measure to assess the balance between a person's competence and the feeling of being challenged ($M = 3.81$, $SD = 0.44$; 17 items; also see Sect. 6), and factors like collaboration (e.g., "I liked working in my group,"

Table 1 Evaluation of the pilot hackathon [13 statements, 1 = not agree at all, 5 = fully agree]

Statements about	M	SD
The challenge [3 items]	3.92	0.84
The groups [3 items]	4.51	0.44
Support by teachers/group [2 items]	4.71	0.45
Recommending hackathon participation [2 items]	4.27	0.70
Self-efficacy [3 items]	4.03	0.74

“Communication in my group was good”), support (e.g., “Support by the coaches was helpful”), self-efficacy (e.g., “I had the impression to have essentially contributed to the success”), and course recommendation (e.g., “I would recommend participating in a hackathon like this”) (see Table 1).

Open field comments supported the quantitative data: People enjoyed the hackathon and liked the challenge, and they reported technical problems were hindering and considered brainstorming online difficult, felt time pressure, were satisfied with the support by the teachers and reflected on team conflicts and communication.

Experience and solutions of this pilot inspired the implementation of a hackathon in the next round with some changes made content-wise and with regard to the diversity of challenges. The final concept is covered in the following sections.

3 Course Organization and Content

The course as such is part of the mandatory curriculum of the study program Human-Machine Interaction at an advanced level. Students from other programs in the department (e.g., eCommerce, Applied Informatics, and Business Informatics), from masters studies or research interns as well as students from the Babes-Bolyai University in Cluj-Napoca, Romania, enrolled voluntarily. Course material is accessible via Moodle and comprises several thematic sections with individual learning goals and suggestions how to go through the material collection. Besides using a variety of different material (videos, research paper with guiding questions, group activities, research posters, etc.), each of the sections contains a multiple-choice self-test. Consultation hours are combined with workshops and are used to bring the students together, give the chance to ask questions, and commonly reflect with varying reflection tasks on the content. To receive credits, participants take a Moodle quiz with questions drawn from the self-test question pool (graded), take part in the hackathon (not graded), participate in the pitch (not graded), and hand in a more elaborate documentation of the idea (graded). On the content level, the course covered the following topics inspired by the UN Sustainable Development Goals (United Nation, 2022), the Future of Jobs Report (World Economic Forum, 2020), or the Essential Eight Report (PWC, 2020): (a) gender and diversity including concepts like stereotypes, the diversity wheel, and Hofstede’s cultural dimensions;

(b) positive computing as a human-centered and well-being-oriented paradigm in technology development; (c) virtual and augmented reality as tools for teaching, sensitization, future work environments, and research; (d) design and perception of social robots as assertive interaction partners; and (e) AI and circular economy and trending fields needing a high level of awareness.

4 Future Society Hack: Didactic Structure, Schedule, Content, and Communication Channel

Closing the course, the *Future Society Hack* took place after 7 weeks. Students were to apply the acquired knowledge and therefore asked to familiarize themselves with all course material in advance. Solutions should draw from and combine at least two thematic areas. While no programming was necessary, a prototypical demonstration of a digital solution leading to a well-being- and flourishing-oriented future society was required. The didactic structure of the course, but especially the hackathon, should train the students entrepreneurial mindset and twenty-first-century skills such as group collaboration, communication, intercultural and gender sensitivity, creativity, and endurance, but also risk-taking, working under pressure, etc.

5 Challenges

Challenges should represent real and relevant questions and covered a thematic variety based on project calls by the Federal Ministry of Education and Research that were shortened and adapted. (i) Innovative Women in Focus: Women are still underrepresented in central and high-profile functions as well as media coverage referring to innovation and science, although they have been essential in innovation and groundbreaking research findings. This lack of visibility must be structurally anchored through innovative approaches and strategies so that it can develop comprehensive and sustainable effectiveness. (ii) Science for All Citizen-Oriented Science: The aim of this challenge is to get the public more interested in science and to strengthen citizens' scientific literacy. This makes developments in research more transparent and accessible. In doing so, it is particularly important to reach target groups that have had little or no access to science. This requires innovative and participatory approaches that optimally address the needs of different target groups. (iii) Innovative Technologies for Live-worthy Surroundings and Quality of Life: The challenge aims to design livable spaces—smart, sustainable, and innovative—in order to create a better quality of life in urban and rural areas. Concepts are to be developed for physical and virtual assistance systems for private and public spaces, from interactive systems for everyday school and work life. Interactive technologies can make local life more comfortable, safer, more sustainable, and more independent—whether in the neighborhood, in the city, in suburban regions, or in the countryside.

5.1 Didactic Structure and Procedure

The hackathon was held in May 2021 and lasted 35 hours. For the organization of the hackathon event, a Webex channel was set up containing a main channel for general communication among all participants, a channel for the coaches, and channels for each of the teams. *Day 1* started with a joint kickoff with all participants in which the overall goal, rules, challenges, and schedule were presented in a 15-minute keynote. Afterwards, participants were activated by a check-in session using a Miro board (interactive digital pinboard; see Fig. 1) and asked to note down fears and expectations on sticky notes. The moderators commented on the notes to reduce the students' worries and spread a joint vision of the hackathon's procedure.

Moreover, students indicated their level of topic expertise and prior experiences with hackathons. This short check-in enhanced the overall open and benevolent atmosphere, since students were asked from the beginning to share their thoughts and feelings. After the check-in phase, the brainstorming and group finding phase began. This was also done on the Miro board (see Fig. 1) in combinations with group calls in Webex. The teaching team supported and moderated the process. All students were asked to collect their ideas, thoughts, and potential solutions on the board. For the challenge-related discussions, Webex group calls were used, where people brainstorm and discuss together different focuses and solutions within one of the three challenges. In the beginning, students could switch between all challenges and discuss their ideas for multiple challenges. Over time, the ideas became more specific and about two to four solution ideas per challenge emerged. With the help of the moderators, students discussed advantages and disadvantages of the solutions and the group finding process started. At this point, students were asked to decide which challenge they finally join. Within the challenges, the students then jointly

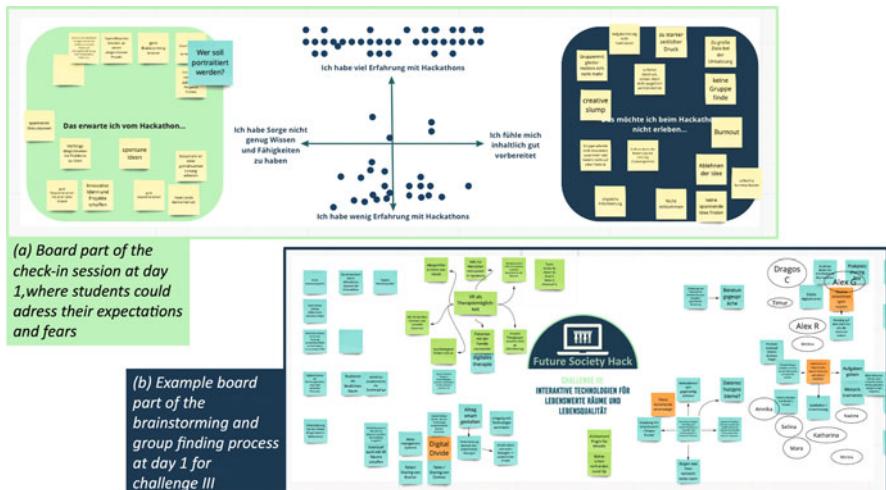


Fig. 1 Example of the used Miro board for check-in (a) and brainstorming (b) session

decided which of the solution ideas they would like to follow. The following seven groups consisting of about six students were built: challenge I (1 group), challenge II (3 groups), challenge III (3 groups) (for results, see Sect. 6). The whole brainstorming and group finding process took about one and a half hours. After that, the final groups started to develop their solution on their own. However, they had the opportunity to receive expert advice from the teaching persons on (a) content-based topics (e.g., AI, social robotics, VR) and (b) prototyping- and pitch-oriented topics (e.g., How to design a pitch deck? or How to develop a clickable prototype? or feedback on graphic design). In order to receive this feedback, the groups actively had to sign up for coaching sessions. We used Google Docs (www.google.com/docs) to coordinate the appointments with the coaches. Here, the coaches offered different time slots (presented in a simple table) and the sub-teams could choose slots by noting their names in the table. The coach then—at the chosen slot—joined the group call of the sub-team and gave the needed expert advice. This trains them to assess when and for what they need help and distinguish which skills and competences are already available in the group (since the groups were interdisciplinary and intercultural). At the end of day 1, a summarizing get-together has been offered to reflect on the first day, the students' experiences, and to give the feeling of shared detachment ("individual's sense of being away from the work situation"; Etzion et al., 1998, p. 579) of work. Nevertheless, the students were free to extend their work after the reflection get-together.

Day 2 started at 9 am with a joint check-in meeting (about 15 min), where the teaching persons again scheduled the day, gave general hints for the pitches in the evening, and spread a sense of unity. After that, students were free to work together in their groups and had the same opportunity to receive expert advice. At the end of the day (5 pm), the solution pitches took place, where all groups presented their final results within 3 min. For the pitch session further external judges joined, to enhance the official and meaningful atmosphere and honor the time that the students spend on their solutions. After each pitch, a short discussion, where all students, teaching persons, and judges could ask questions, was held. This was especially important for the groups to receive final feedback before they handed in the final course results. The whole atmosphere at the pitching session was meant to be benevolent and all teachers expressed their gratitude and pride about the students' work. At this point, no assessment or rating have been communicated, to keep the students motivated and leave a positive experience of the hackathon behind.

5.2 *Challenge Solutions and Hackathon Winners*

The judges evaluated (without grading) all pitches. In sum, they were enthusiastic about the maturity of the prototypes, since some groups already had created ready-to-use clickable prototypes with high-level details. Three winners were selected in a democratic process, where each judge listed their favorite and the teams that have been mentioned the most were selected to be the winners. All winners received a

certificate and a cup branded with the hackathon name as a price to honor the good and creative ideas. Winners were the following solutions, each described by a tweet written by the teams themselves (as part of the solution documentation):

The situation in the old people's home has never been as lonely as it is today. That's why we need to act – now! InnoHeim – the innovative solution with smart technologies and robots that revolutionize the home for the elderly and promote inclusion #inclusion #innovation.

Edutainment with a clear mission: Virtual Escape Room creates awareness for female entrepreneurs in a playful way and helps people interested in starting a business to network. #whowasthefounder #thefutureisfemale #womenintech #femaleentrepreneurship.

A smart city, has smart citizens, so start sharing. Lend your parking space when you're not using it, and in return you'll get a new one that fits your needs. This is where you stop standing in traffic and start moving! #smarttrafficlight #sharingeconomy.

6 Evaluation of Hackathon Experience

In order to get deeper insights into participants' perspective, an evaluation was setup with SoSci Survey, a free online survey tool. The landing page would explain that the evaluation intends to capture participants' course experience and how they felt about the hackathon, their group, and the project results. Subsequently, they were guided through questions about demographics (gender, study program, challenge number); overall experience of participants; statements measuring their flow; statements assessing aspects concerning their work in groups, support, etc. (Table 2); and statements about entrepreneurial skill training (Table 3) and prioritizing the top three of skills that have been trained. The questionnaire closed with an open field asking for positive/negative feedback, ideas, and recommendations for further hackathons. Besides the demographics (which used checkboxes), the overall evaluation (which used frowning to smiling faces), and the prioritizing task (which used drag and drop options), all statements in the questionnaire were to be answered using 5-point Likert scales in which a smaller number indicated a low level of agreement or relevance (e.g., not at all, does not apply, do not agree at all).

Table 2 Evaluation of the future society hackathon [13 statements, 1 = not agree at all, 5 = fully agree]

Statements about	M	SD
The challenge [3 items]	3.85	0.80
The groups [3 items]	4.59	0.45
Support by teachers/group [2 items]	4.20	0.50
Recommending hackathon participation [2 items]	4.04	0.96
Self-efficacy [3 items]	4.26	0.42

Table 3 Self-assessment of skills trained by taking part in the hackathon [13 items, 1 = not at all, 5 = very much]

Skills	M	SD
Critical thinking/problem solving	4.05	0.79
Creativity	4.00	0.87
Communication	4.36	0.66
Collaboration/cooperation	4.64	0.58
Curiosity	3.45	0.91
Initiative	4.18	0.73
Endurance	4.32	0.84
Adaptability	4.05	0.90
Leadership	3.59	0.85
Social and cultural awareness	3.68	1.04
Well-being-oriented technology development	4.09	0.97
Gender and diversity awareness	3.43	1.12
Risk-taking/courage	3.14	0.89

From all course participants ($N = 60$), 22 provided feedback ($m = 10, f = 10, 2$ no answer). The majority ($N = 16$) was enrolled in the study program Human-Machine Interaction. The overall experience that was assessed using a Kunin scale (1 = frowning face, 5 = smiling face) was positive ($M = 4.32, SD = 0.72$). Flow (i.e., feelings of joy, task concentration, obliviousness, and competence) was measured with 17 statements adapted from (World Economic Forum, 2020) (e.g., I was fully concentrated, I was absorbed in my task) and resulted in a high mean value ($M = 4.53, SD = 3.72$). Self-constructed statements were implemented to assess the evaluation of the challenge, working in groups, if people would participate again and recommend participation, if they felt supported and about the level of self-efficacy they felt (see Table 2). Since it was of interest in how far participants felt that the hackathon trained specific skills, participants were asked to indicate how intense the hackathon trained each of a list of skills and traits relevant in entrepreneurial thinking.

Taking a closer look at the twenty-first-century skills literature and literature on entrepreneurial mindset and skills, there is a high congruence between the skill sets (apart from the hard financial and legal skills on the entrepreneurial competence side). Creativity, endurance, communication, and leadership skills, as well as interpersonal awareness (social, cultural, and diversity awareness), curiosity, and ideation, are prominent elements of both concepts. Consequently, a self-constructed list of concepts was used, including personal skills, on the one hand, and aspects, e.g., well-being-oriented technology development and gender and diversity awareness, referring more to aspects that have been explicitly part of the teaching agenda on the content level.

Results are displayed in Table 3. Subsequently asked for a prioritization of a list of three of the aforementioned skills, participants chose the following: communication (10 indications), collaboration/cooperation (10 indications), and endurance (10 indications) where each named among the 3 most fields that people perceived

a learning gain by participating in the hackathon. Also important were problem-solving (9) and creativity (7). Initiative was mentioned four times, risk-taking twice, and the rest three times. Leadership and curiosity were mentioned once among the top 3. Nine participants left comments in the open fields with mostly positive comments on the experience as a whole while reflecting upon problems and challenges related to time pressure and creative processes under the given circumstances, chances to train existing skills and develop new ones, group communication, and scheduling. Suggestions included to involve more participants from other study programs, to provide a fixed and specifically prepared challenges beforehand and a schedule for both days.

7 Discussion and Lessons Learned

Embedded into an interdisciplinary curricular course offer that was transformed into a purely online version due to the pandemic, the chapter described the content as well as the implementation and evaluation of a two-day hackathon as a refined concept of an earlier pilot. The intense engagement in the challenge over 2 days appears to be a successful format to inspire students breaking with routines and expose them to new, uncontrollable situations while accompanying them in this new and state of insecurity with support offers. Challenge solutions and pitches varied in diversity and maturity. The participants reported to have trained important skills of an entrepreneurial mindset and are motivated to participate again as well as to recommend participation in the format to others. Both hackathons were evaluated positively, generally, but also with regard to the group and the level of self-efficacy experiences, support, and challenges to be solved. However, it needs to be mentioned that most of the participants knew each other before that hackathon, which might have made the online interaction more easy than that with strangers.

From a teacher's perspective, a number of lessons learned and recommendations can be outlined: The format requires a *high level of manpower* and a lot of experience, courage, and spontaneous responsiveness on the part of the teachers. The online-only situation allows a tailored personnel deployment, on-demand and without wasting time. It is possible to allow participants', e.g., with child supervision tasks, participation, which would be more complicated in an on-campus face-to-face situation. However, the housing situation needs to allow concentrated work, which cannot be ensured in every case. The *technical infrastructure is crucial* and has to work well. All participants need to be equipped with good devices and strong connections—otherwise, this turns out as hindering factors of the digital-only course. Students and teachers (as well as coaches that might contribute to the hackathons with their expertise) need a *high level of digital skills* in order to also spontaneously find alternative solutions if the infrastructure does not work as expected. Students (at least some of the group) have to be *familiar with prototyping tools, video/audio cutting*, etc. beforehand and have access to them if the requirement is to illustrate the idea using some creative media. If they are not experienced enough, this will distort them from working on their solution as such.

It is advisable to counteract the feeling of being overwhelmed or exhausted with *motivating intervention*. A longer duration is not advisable. A longer duration can promote exhaustion and people falling out of the flow. It would also demand more from teachers and coaches as guides on the students' side. The course can be seen as a *short but intense, positive experience* and may have a lasting effect on, for example, self-efficacy. A good combination of previous knowledge and new challenges must be ensured without creating pressure in order to enable a state of flow. Do not attach any grading to the hackathon itself and to the pitch at the end to motivate and encourage positively. *Give feedback and give them time to further elaborate* on their idea after the hackathon.

Pitch trainings and material on pitch composition are helpful to make expectations clearer regarding the maturity status the idea is required to have. The desire for the challenges to be published in advance that was mentioned in the evaluation is understandable, but contradicts the concept—it is not desirable that some might deal with finding a solution long in advance and others join in only afterwards; everyone has to start with what they bring to the table and contribute, based on the possibilities within the group, to the best result.

The two iterations have shown that there is a lot of potential for further research about hackathons as part of university curricular in a national or cross-national, interdisciplinary context: The success factors of creating an atmosphere that is both challenging and supporting and that makes use of individual competences still remain an open research question, especially when it comes to digital collaboration and distributed learning environments. It must be elaborated how many people can actually be looked after in such a format. In the next run, students will be more mixed with a stronger intercultural influence through the participation of a higher number of people from the Romanian university. Also, other than in the previous run, the majority of people will not or seldom have met each other in person before, due to the pandemic which might represent an obstacle in interpersonal communication standards and trust. Both circumstances, combined with a tight schedule, will show how diversity and a relative anonymity influence self-reported satisfaction, skills acquisition, and challenge solutions. In further iterations it is also to be considered how certain skills that are perceived to rather be in the background, e.g., courage and risk-taking, can receive a more pronounced role. It should also be considered which other skills of the entrepreneurial mindset are still missing from the list—how they can be trained and whether this can be meaningfully integrated in connection with the module. Against the background of a comparably small number of female founders, gender differences in communication and working style and preferences will also be a topic of analysis.

To conclude, based on the challenge solutions, pitches, and subjective evaluations of the participants, a two-day (coding-free) hackathon can be beneficially used to train entrepreneurial skills without addressing them actively in the course content. Using the active, open, and intense working situation of a hackathon and enrich it with the possibility of receiving expert advice can train participants' soft skills like risk-taking, curiosity, and self-regulated activity that is needed to be an entrepreneurial pioneer.

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Design Sprints: A New Tool for Social Entrepreneurship Education



Carina Volk-Schor and Antje Wild

Abstract The subject of social entrepreneurship has considerably gained traction in recent years. There is significant debate about the optimal teaching concepts for this subject, providing sufficient structure to students, supporting collaborative group work, and encouraging the students to follow up their respective projects after the course or even after graduation.

This study analyzes how the method “design sprint” can positively impact social entrepreneurship education. Design sprints combine several design thinking and lean start-up practices into a structured multiday format. For this study the authors created a university course in the field of social entrepreneurship. To evaluate the impact of the course, a variety of qualitative data sources was collected, ranging from learning diaries to surveys, interviews, and observations. Results indicate that design sprints provide much-needed structure to students, especially if supported by the right digital tools. They also support collaborative group work by reducing free-riding behavior and providing valuable practical skills to students.

Keywords Entrepreneurship education · Social entrepreneurship · Design sprints · Teaching formats

1 Introduction

During the last century development aid was the main way to address social challenges such as health, poverty, or education. In recent decades the importance of social entrepreneurship as an alternative has increased (Harding, 2007). Social entrepreneurs are commonly defined as entrepreneurs addressing social problems through market-based and innovative interventions while also seeking financial independence from external funds (Miller et al., 2012). Although it is difficult to calculate the exact impact of social entrepreneurship, reports from a variety of

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countries show that social entrepreneurs have achieved many successes, from reducing poverty to providing health care and protecting the environment (Ahrend, 2016).

Due to such successes, interest by students in social entrepreneurship education has increased in recent years. Therefore, more and more universities include it in their curricula (Miller et al., 2012).

Lackéus (2015) defines three areas of entrepreneurship education: Teaching **about**, **for**, and **through** entrepreneurship education. Teaching “**about**” entrepreneurship focuses on the theory of entrepreneurship. “**For**” reflects the learning of the basic knowledge and skills for entrepreneurial activity (Lackéus, 2015; Bartsch, 2019; Pache & Chowdhury, 2012). The approach “**through**” entrepreneurship education mainly concerns the methodology. It concentrates on the “doing” of entrepreneurial activities and less on the content learning goal (Bartsch, 2019). Teaching “through” entrepreneurship provides students with hands-on experience through project-based and experiential learning, allowing skills to be acquired during the process (Wihlenda & Brahm, 2020).

This case study combines teaching for (social) entrepreneurship and teaching through entrepreneurship. Specifically, we combine lectures on social entrepreneurship with a design sprint.

Design sprints are a method first developed by Jake Knapp at Google ventures. In a five-day format, a variety of design thinking methods are applied in a very structured format (Knapp et al., 2016).

Design sprints have gained widespread popularity among companies, institutions, and social enterprises. They have been used to develop new software applications (Magistretti et al., 2020), reform the way government services are delivered (Parallel, 2020), and develop innovative health-care approaches (Martinez et al., 2018). Design sprints have been applied successfully by a wide range of organizations which include the United Nations, Lufthansa, and LEGO among many others (Bacq et al., 2020). They are generally valued for the possibility to incorporate user feedback from the start, iterate quickly, and provide testable solutions with clear results after just a few days (Knapp et al., 2016; Magistretti et al., 2020).

These characteristics are also beneficial for social entrepreneurs, as they usually need to move quickly with limited resources while creating a solution that will truly benefit their users. At the same time, design sprints also provide a suitable teaching tool based on their clear structure, short time span, and high level of malleability (Bacq et al., 2020; Ferreira & Canedo, 2020).

Initially, design sprints have been used to teach software development (Magistretti et al., 2021) and entrepreneurial skills in general (Bacq et al., 2020; Neergard et al., 2022). Yet, only few studies have so far explored their use in education beyond the areas of technology and business studies. Notable exceptions are studies by Neegard et al. (2022) which have applied the method to teach nursing students about entrepreneurial methods and Bacq et al. (2020) which have organized a virtual “idea blitz” as a response to COVID-19, incorporating some elements of design sprints. We aim to contribute to this literature and explore how the method

can be incorporated in an interdisciplinary course setting focusing on social entrepreneurship.

1.1 *Design Sprints*

In the regular setup a design sprint starts on the first day (usually a Monday) by convening the team, clarifying roles, and choosing a long-term goal for the project, e.g., what should be achieved in 1–5 years. In his book Knapp (2016) provides an example of a start-up with the long-term goal to match more patients with clinical trial studies, thus providing more patients with access to the latest treatment and accelerating the speed of research. The team then decides on which question they want to focus on during the sprint, rephrasing potential obstacles into questions. In the clinical trial example, these were “can we find matches fast enough?” and “will clinics change their workflow.”

To incorporate existing knowledge and understand stakeholder as well as user opinions, the team then conducts 3–6 stakeholder interviews. The results are collected on Post-its and used to map the customer journey. Any arising questions are phrased in the style of “how might we question,” a common tool in the field of design thinking.

We kept this general approach, but asked teams to conduct the user interviews before the sprint, because we wanted to make sure that the teams were adapting to the schedule of their users. As several of the student teams were working with users in Africa, their users frequently did not have access to a personal mobile phone and were not available at all times. Thus, teams had to adapt and also plan more time for this step. We instructed teams to conduct interviews beforehand and included a review section on the first day, where teams could collect all the input they received from the interviews.

In a regular sprint, Tuesday is used to research best practices from other products, domains, and industries (Knapp et al., 2016; Ferreira & Canedo, 2020). How have others solved our problems before? Which inspirations can be gained here? These examples are presented in the style of “lightning demos,” where many different options are presented in a rapid speed. In the following, promising ideas are presented further and more detailed sketches are created for the best of them.

Participants then use the Wednesday to present the ideas by hanging them on a wall, similar to a museum gallery. Everybody notes which aspect of the different ideas they like best, by sticking little dots next to them.

We combined the activities for Tuesday and Wednesday together into our Day 2, as we found that students were rarely able to leave their courses for a whole week. By limiting our design sprint to 3 days overall (and scheduling them Thursday–Saturday), we could reduce the friction in the student’s schedule.

The Thursday of a design sprint week is usually spend creating the prototype (Knapp et al., 2016). We scheduled this for our Day 3. As we were conducting a completely digital sprint, our students had a variety of helpful digital tools to choose

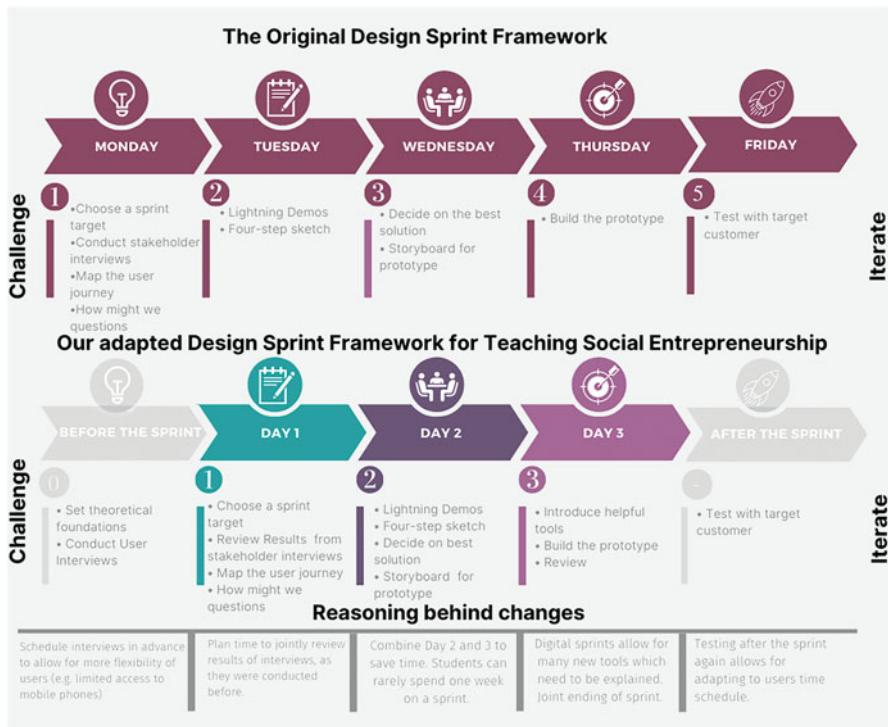


Fig. 1 Design sprints

from. Thus, we scheduled 5-minute input sessions for each tool before letting the students start with their prototyping. These tools included Canva for creating flyers, Storyboard for creating explainer videos, and Wix for creating homepages. Some of the tools were presented by the team of lecturers; others by experienced participants in the seminar.

Usually, the Friday of a sprint is spent on testing with real users. This is very helpful, as it increases the focus during the other days and creates a satisfying end to a sprint. Previous studies have sometimes skipped the requirement to test with real users (Neergard et al., 2022) or have replaced them with faculty and research assistants (Ferreira & Canedo, 2020). However, we considered it crucial to get feedback from actual users. Thus, we allowed the team two more weeks to coordinate schedules with the actual users of their proposed solution.

Figure 1 provides an overview about the main stages of a design sprint and how we adapted them for a social entrepreneurship course.

By adapting the design sprint concept to the teaching context within social entrepreneurship, we aim to provide a new method to practitioners and teachers. We combined this approach with a research project to establish its efficacy and answer the following research questions in Fig. 2:



Fig. 2 Research questions

Thus, we contribute to the existing research in the following ways: First, we follow the call for research by Brock and Steiner (2009) to examine the effectiveness of different in-class activities for teaching social entrepreneurship. By adding the design sprint methodology, we add to the method pool available to teachers in the field.

Second, we explore the use of design sprints in an area where they had previously not been applied. By comparing the methodology to traditional teaching instruments like service-based projects and case studies (Brock & Steiner, 2009), we are able to provide both practitioners and teachers with an implementation roadmap as well as an evaluation of benefits and challenges. Specifically, we focus on benefits for the collaboration between group members, which is a frequent issue in group-based projects.

As social entrepreneurship education is mostly taught in group settings, it is of special importance to achieve a successful collaboration between team members. Students point out that the problem of noncontributing team members is one of their main challenges in successfully completing projects (Brooks & Ammons, 2003). Previous studies have mostly focused on actions students themselves should take to prevent free riding (like peer assessments at the end of the course). We add to this literature by exploring whether changes to the course structure by the instructors can prevent its occurrence from the beginning.

In addition, we add to initial studies applying design sprints in educational settings (like software development) and identify necessary adaptations. For instance, Neegard et al. (2022) point out that students in interdisciplinary courses which include many non-tech and nonbusiness students will need more preparation time before conducting a sprint to introduce key concepts to them. Also, previous studies have skipped testing the resulting prototype with users (Ferreira & Canedo, 2020; Neergard et al., 2022) and replaced them with pitching events or interviews with faculty members, presumably due to challenges with course logistics. We aim to adapt the method in a way that it is possible to include real user feedback.

Finally, we transfer this method which was initially designed for in-person events to a virtual setting. A few previous studies have demonstrated that this is possible (Bacq et al., 2020). We add to this stream of literature by examining the positive and negative effects of a virtual setting and exploring suitable tools that can support this setup.

2 Literature Review

While many definitions of social enterprises exist, we follow Kruse (2019, 2021) (see p. 3, in Kruse et al. (2021)) and define a social enterprise as an enterprise that “(a) has a business model, (b) combines a social mission with the aspiration to generate financial profit, and (c) is innovative and involves considerable risk.” Social entrepreneurship is then considered as the process through which social entrepreneurs create social value by innovatively using and combining resources (Mair & Marti, 2006).

The growing general interest in entrepreneurship and the rising awareness of societal issues among students has led to an increase in social entrepreneurship education (Brock & Steiner, 2009). Yet, just as long as the topic has existed, there have been extensive discussions about the right teaching methods (Tracey & Phillips, 2007; McNally et al., 2020).

Previous studies have found that courses have moved away from instructor-oriented courses to student-centered courses (McNally et al., 2020). These often include a service-learning experience, where students conduct a project that benefits an NGO or other organization (Brock & Steiner, 2009). This is frequently done through some kind of group project, such as creating a business plan for a social enterprise, a marketing campaign, or writing a grant proposal (Brock & Steiner, 2009).

However, these types of projects have the constraint that they require a close match between student skills and organizational needs. In addition, if students feel that they lack the structure to reach their goal, they might feel lost during the project or deliver substandard results to their clients. Furthermore, they might need high levels of support from the teaching team, reducing the possibility of scaling the approach.

We explore whether the design sprint methodology explained in the introduction can be a tool for social entrepreneurship education that addresses these challenges. Specifically, we want to understand whether the detailed structure of an action-oriented learning methodology like design sprints can support students. Especially we focus on those students that are new to the field of entrepreneurship and might lack confidence in their own competence.

2.1 *Advantages Compared to Other Teaching Methods*

Previous studies on the use of design sprints in education have found that they helped teams to develop creative ideas quickly (Bacq et al., 2020), gain a deeper understanding of course content (Ferreira & Canedo, 2020), and empower students to act entrepreneurially (Neergard et al., 2022). In addition, the few studies having focused on their use in social entrepreneurship education have found that they can also accelerate social entrepreneurial actions (Bacq et al., 2020).

Adding to this list, we theorize that design sprints can also help reduce free riding of some group members – one of the challenges hindering many project-based learning activities.

As discussed, social entrepreneurship courses are strongly based on service-learning activities, where students solve a real societal need, usually conducted as part of a group project (Brock & Steiner, 2009). However, student group works are frequently plagued by free-riding behavior from some team members (Brooks & Ammons, 2003; Ashraf, 2004). As this problem occurs in many group-based settings, various remedies to this problem have been proposed. They range from early and frequent peer evaluations by students (Brooks & Ammons, 2003) to let group members “fire” the free-riding group members (Abernethy & Lett, 2003).

Researchers have identified a variety of reasons for free riding (beyond the frequently assumed laziness), such as feelings of insecurity about the task at hand, differing opinions with regard to how quickly work needs to be completed, or even purposeful exclusion of weaker team members by stronger ones (Hall & Buzwell, 2012).

During a design sprint, all team members work on the problem at the same time and frequently reconvene with each other and the lecturer to discuss their findings (Knapp et al., 2016). Thus, intentional free riders would have to return after a working session with nothing to show for. This would not only be immediately visible to their teammates but also to instructors who have permanent access to all team results through the shared digital boards. Unintentional free riders, on the other hand, receive frequent opportunities to clarify potential questions and are less likely to be excluded as all tasks are completed on a joint time frame.

2.2 Disadvantages Compared to Other Teaching Methods

At the same time, the highly structured format of a design sprint can also be a disadvantage. Within a design sprint, students operate in an environment where expectations and next steps are clearly articulated. On the one hand, one could argue that this is never the case in a true entrepreneurial setting, leading to an experience that is too far removed from the reality of starting a social enterprise, not preparing participants sufficiently for the messy world of entrepreneurship.

On the other hand, exactly this structured format can provide students with feelings of mastery, as they are able to develop, implement, and test their own ideas within a very short time frame. This initial feeling of mastery could then help with kickstarting follow-up activities that would otherwise have appeared too daunting. Bacq et al. (2020) found a similar effect in their study, where many participants of their idea blitz (which was based on the design sprint methodology) conducted independent follow-up projects after the end of the project.

2.3 Need for Adaptation of the Method Compared to Previously Used Settings

Compared to previous studies where design sprints have been used for teaching software development and nursing (Neergard et al., 2022), using design sprints in social entrepreneurship poses some additional challenges. In many cases users of the potential solution are located far away from the teams conducting the design sprint. This complicates the gathering of feedback that is essential.

Also, cultural differences and differences in socioeconomic circumstances might make it harder to truly understand users' needs, a frequent challenge in the field of UX research (Lee & Kun-Pyo, 2007).

We addressed these challenges with a variety of different remedies: First, the design sprint format was changed to allow for more flexibility in coordinating interviews and feedback sessions with users. Second, we provided teams with mentors from the respective user communities. These mentors offered the necessary connections to the users, were able to build trust between the users and the team, and could mediate in the case of cultural challenges. Third, we addressed the challenges caused by this setting in the course and teams exchanged their experiences and best practices.

2.4 Effects of a Digital Setting

Finally, due to COVID-19, the design sprint was conducted in a completely virtual setting, whereas the concept was originally developed for in-person meetings (Knapp et al., 2016). We theorize that this has mixed effects on the successful use of the method. On the one hand, a completely virtual setting allows the instructors to check in on students' progress in regular intervals without having to disturb the group work, as all work is being done on a shared virtual whiteboard.

It also avoids the frequent problem of not having consistent access to the same rooms and having to switch rooms, disrupting the progress (Knapp et al., 2016; Bacq et al., 2020). At the same time, previous studies (in in-person settings) have found that mobile phones and digital devices can be a significant distraction for students (Ferreira & Canedo, 2020). During in-person sprints, all digital devices are banned from use during the sprint. In our case, their use as a research tool was explicitly encouraged. We will use the case study to explore the effects of this policy.

3 Case

The intention of the course was to convey the theoretical foundations of successful social innovations and enable students to take the first steps towards the implementation of their own ideas. Students were recruited from all degrees offered at the university, including Bachelor as well as Masters degrees and the course was offered as an elective. The course was divided into two parts: four classroom sessions and a three-day block seminar. Students were encouraged to develop their own projects in the field of social entrepreneurship and to start implementing them. In particular, they were supposed to learn to work in a customer- and user-centered way, build prototypes quickly, and gather feedback.

The entire lecture, including the block seminar, took place completely digitally. This involved alternating between discussion and presentation of results in the Zoom plenum and working in group rooms, using different tools like a digital whiteboard (Miro).

The first session included digital keynote speeches from stakeholders in the field of social entrepreneurship. These lectures were intended as a source of inspiration for possible project ideas. For example, an initiative promoting sustainability in the region, a representative of Amnesty International, and a former founder were guests. At the same time, students were also able to contribute their own ideas. In the end, the projects chosen by the students covered a wide range of topics and the 11 students split across three groups:

1. Creation of a women's shelter in rural Kenya to protect women fleeing from domestic violence. This project was started based on input from a local Amnesty International representative from Tanzania. The goal is that the shelter can support its own operation. How this should be achieved (through the offering of services, selling of goods, etc.) was to be explored during the course.
2. The creation of a fairly produced gin, which supports high-quality jobs in South Africa. This project was developed based on the idea of a participant with ties to the area.
3. The development of an app that supports customers with a wide range of food allergies by letting them know which meals are safe to eat in a restaurant. This project originated from the experiences of a team member with a severe food allergy.

The course was structured to support the groups in moving forward with these projects. They first learned the basics in the field of social entrepreneurship, such as the design of business models in the social sector. They also gained in-depth insights into different methods and frameworks such as design thinking, lean start-up, and business model canvas as well as the impact model canvas.

Towards the end of the semester, a three-day block seminar followed. This block seminar was based on the concept design sprint developed by Knapp et al. (2016), as described in the introduction.

After completion of the design sprint, the groups had 3 weeks to gather user feedback on their results and prepare a presentation. These were then presented at a pitch event to a jury. The course grade was based on the presentation, divided between pitching the respective solution and reflecting on progress during the course. All presentations took place digitally via Zoom. In addition, each student prepared a learning diary, reflecting on their own learning progress. Based on this form of examination, we were able to record and recognize individual learning progress. This was important as students from different semesters and majors had participated in the elective.

4 Methodology

The focus of this study, combining social entrepreneurship and design sprints, has not been covered extensively so far. Thus, we decided to adopt a case study methodology (Yin, 2012), allowing a deeper understanding of the data compared to a quantitative study (Magistretti et al., 2021).

During the course, we collected a range of different data sets and used them as input for our study:

1. The students created learning journals reflecting on their projects.
2. They filled out anonymous questionnaires about the experience. A total of 11 participating students received a half-structured questionnaire, which was based on the previously made observations and on the research questions that had been established. The principles of creating a qualitative questionnaire were taken into account (Mayring, 2016). The questions were formulated according to the target group and kept open in order to best reflect the behavior and experience of the students. Closed-ended questions were also incorporated in order to use filtering functions, e.g., by asking more in-depth questions from students with more experience (Döring et al., 2016).
3. A selection of students took part in half-structured qualitative interviews. A half-structured interview was based on an interview guide with open-ended questions (Döring et al., 2016). According to the principle of openness, unexpected information and new aspects on a topic could be captured (Gläser & Laudel, 2010).
4. The instructors, together with a separate researcher, observed group interactions during the course and collected their results.

The learning journals and surveys were already available in a written format. The interviews and observations were transcribed in order to be coded. The collected data was evaluated interpretatively with an inductive coding system using the MAXQDA program (Döring et al., 2016).

In this process, the documented data sources were analyzed in a systematic procedure and a category system was formed (Mayring, 2016). Information was then assigned to the different categories, in order to reduce the complexity of the data, and key insights were extracted (Gläser & Laudel, 2010). Following the

approach by Magistretti et al. (2021), information was first analyzed separately by the authors and then discussed jointly to extract the most insightful information.

5 Findings

In Fig. 3 we showcase our findings regarding the different research questions.

5.1 *Advantages and Disadvantages Compared to Other Teaching Methods*

Combining the insights from the learning journals, the questionnaires, the interviews, and the observations, we find a range of advantages of design sprints compared to other teaching formats like traditional lectures and more unstructured project-based learning formats.

The design sprint format provided a very clear understanding of which tasks were required from students. This significantly reduced task ambiguity and reduced fears from students with low levels of previous exposure to entrepreneurial activities. At the same time, it allowed for the creative expression of student ideas. Students felt that they could quickly turn their ideas into something real.

This structure helped me a lot because it provided a concrete goal towards which we were heading as a team. [...]. The design sprints gave that missing structure, which is why I think the results were better here, too. Everyone knew where the journey was going and of course, everyone had to do their part. (Learning diary, course participant 1)

The prototyping made the whole product feel real. (Survey D)

Through the method, students had a clear understanding on how they could make progress on their idea, which was perceived as highly motivating. Students also gained a better understanding why concepts like prototyping and user research are important to create good ideas:

We moved along faster. We were not stuck as long as usual and we had more creative ideas. (Survey B)

In those (previous courses taken at university) there was mainly a lot of research and only few aspects were confirmed or refuted with interviews and questionnaires. Therefore, I will use the design sprint approach in future projects to get feedback as early as possible! (Learning diary, course participant 5)

These results exhibit a progression that students do not experience in a traditional lecture. Traditional project-based learning usually provides a problem and some guidance to students, but it is a lot less detailed than during a design sprint. This can

	key results learning journal key results questionnaire key results interviews	Which advantages does this method bring to (social) entrepreneurship education?	What disadvantages does this method bring to social entrepreneurship education?	How does the application of design sprints differ when it is used for social entrepreneurship instead of other disciplines?	What impact does a completely virtual setting have?

Fig. 3 Findings (if a finding was based on several data sources, this is indicated by the small additional Post-its)

be beneficial for highly independent students, but detrimental for those who are initially overwhelmed.

Another advantage was that the format helped to reduce lengthy discussions about the merits of potential ideas, which frequently slow down efficient decision-making in group projects. Students specifically praised the voting mechanism, which allowed them to move forward quickly and without negatively connotated discussions while also incorporating each group member's opinions. This was also noted by the observers, which noticed a much higher progression rate of the teams than expected, based on other traditional course formats.

[The method] helped to move forward fast from idea to implementation, there were no lengthy discussions. [...] Through democratic decisions, we came to decisions quickly and discussed for a shorter time. (Survey A)

What I found very helpful about this method is that after listing the possible goals, you then vote democratically. (Learning diary, course participant 4)

The democratic decisions were helpful, as everybody could and had to contribute. (Interview, course participant 1)

Finally, our results showed that the design sprint phase almost eliminated free-riding behavior within the groups. Whereas the learning journals and observations indicated that free riding was a significant problem prior to the sprint, the 3 days during the sprint showed the teams working as a cohesive unit. This is attributed to the fact that teams worked in parallel in comparatively short time units. They frequently had only 30 min or an hour to complete a task and all activity was visible to all other team members and the teaching staff on the virtual whiteboard.

Thus, a design sprint format seems to be able to prevent free-riding behavior during the activity:

The team worked intensively together and developed a prototype together. Especially the close exchange and the long time spent together on the elaboration of the idea promotes progress enormously. The objectives of the individual phases also forced everyone to get to grips with the subject matter. In retrospect, it can be said that the teamwork worked best here. Everyone contributed and developed new ideas on how to move our idea forward. Positive criticism was also voiced, which was almost unheard of before. (Learning diary, course participant 1)

In addition, previously discussed reasons for involuntary free-riding behavior such as feelings of uncertainty about the task at hand, differing opinions about how quickly the work must be completed, or even the deliberate exclusion of weaker team members by stronger ones (Hall & Buzwell, 2012) were also prevented by the design sprint format.

The structured timeframe required the results. You had to deliver and could not procrastinate. (Survey G)

However, it could be observed that after the design sprint phase, productivity and group affiliation leveled off and complaints of free-riding behaviors returned.

It can be so tiring to wait for reactions and input from others who are obviously not interested in the topic. (Learning diary, course participant 2)

Regarding the disadvantages, students mainly noted that they initially felt stressed by the time pressure created by the sprint format. Interestingly, many also noted that they came to appreciate this aspect later on and are even considering to implement time boxing in other projects outside the class. Also, it was noted that for teams interacting with users in Africa, the time frame for interviews was still considered too short. The team would have liked to interview more users and get an even better understanding. In this case, the design sprint might have cut short beneficial user interactions.

Finally, it remains to be seen how teams fare outside the classroom, after being used to a highly structured environment, as entrepreneurial settings rarely provide clear-cut directions how to proceed. After receiving a lot of support and structure during the sprint, the gap to the entrepreneurial world outside the classroom might be perceived as larger than in a regular project-based course (Braukmann et al., 2009).

5.2 *Necessary Adaptations*

We noted that a few important adaptations are necessary to a design sprint if students from nonbusiness or non-tech majors participate. First, students from degrees like “Health Management” have less initial knowledge of entrepreneurial activities in general. Thus, more introductory lectures are needed, before they can start with their sprint. These students might also harbor fears whether they possess the right competencies for such a course. We included initial lectures on social entrepreneurship before starting the sprint, which proved to be beneficial.

In addition, the resulting ideas from a social entrepreneurship course might need more support if students want to follow up. These ideas are less geared towards profit maximization and more towards a positive societal impact. Students thus expressed worries about finding sufficient funding to follow their ideas further.

If I had financial support, I would be more likely to keep working on the idea and the start-up. A seed-funding from the universities or something similar would be helpful. (Interview, course participant 2)

5.3 *Impact of a Digital Format*

The design sprint was conducted completely virtually. Previous studies have used tools like Google Docs (Bacq et al., 2020). We find virtual whiteboard tools like Miro to be even more suitable, as they are a good fit for the highly visual nature of a design sprint. Every group received a previously prepared digital whiteboard with all

the relevant questions and sample answers as well as an introduction to a variety of tools for prototyping. Students perceived this as very helpful:

It [the digital whiteboard] was a great overview and can only be recommended. (Survey E)

It was the first time that I worked with it [the digital whiteboard], but I had heard a lot about it previously. I really liked it and will definitely use it for future projects. Survey F)

During their digital design sprint, students also built competencies in other digital tools while they were creating their prototypes (webpage builder, design tools, video tools). This was perceived as a highly transferable skill, which the students considered very useful.

In the course of the design sprint I got to know different tools that I wasn't aware of before. Tools like Wix, to create websites, or Canva, which we used to create our flyer. I will enjoy using them in the future for my further projects at university, but also in my professional life. I especially liked Miro, because even complicated issues can be recorded in a structured way on the board. (Learning diary, course participant 5)

6 Conclusion

This work provides insight into how the design sprint methodology can be used effectively in the education field, particularly for teaching social entrepreneurship. We confirm findings by McNally et al. (2020) and Brock and Steiner (2009) that social entrepreneurship education benefits from experiential learning formats and project-based approaches.

Specifically, we find the use of a three-day virtual design sprint in combination with some preliminary lectures to be a highly suitable teaching tool. We agree with the findings by Ferreira and Canedo (2020) that sprint sessions should be concentrated and not dispersed across the semester. If this is the case, we found the three-day format to be a sufficient amount of time.

The challenges described in the study by Ferreira and Canedo (2020) regarding student shyness, delays in returning to the course, and lack of motivation were not confirmed by our study. Instead, motivation and contribution from participants peaked during the design sprint section of the semester and participants were highly punctual. Potentially, this is due to the more intrinsically motivating topic of the course, compared to traditional software engineering.

We also assessed the potential of design sprints to reduce free-riding behavior, as this is seen as highly detrimental to group-based service-learning projects. So far, a reduction of free-riding behavior had mostly been addressed from an assessment perspective (e.g., through peer assessment) or by excluding free-riding group members (Abernethy & Lett, 2003). We add to this literature by proposing a change in course structure as an alternative tool and find first promising results. Thus, we come to the conclusion that a course structure that incorporates a highly structured format, maximum transparency with the help of digital tools, and immediate group feedback through the use of voting tools can be a suitable alternative to reduce free riding.

However, we also find that free-riding behavior returns after the end of the design sprint. Hence, a combination of different methods might be needed to reduce it as much as possible.

Finally, we also assessed the impact of a digital format. Our data shows a strong positive effect of conducting the design sprint in a digital format, as the digital tools have shown to be highly efficient in informing students about the task at hand, providing transparency and a practical collection point for the group's findings. This structured environment also alleviated fears among students who have had little exposure to entrepreneurial activities beforehand. In addition, the use of digital whiteboards reduces the usually tedious work of documenting design sprint results for future reference. Thus, we can recommend this approach for future courses.

The results of our study are applicable beyond the university context as well, for instance, for social impact incubators. These incubators assist social enterprises with financial and nonfinancial support (Hirschmann et al., 2021). Our abbreviated design sprint format can be a useful addition to the available toolkit of these incubators. Due to its digital format, it can even be conducted with internationally dispersed teams or in situations where no expert is available onsite to support a team.

With regard to the limitations of the study, it should be noted that it is hard to generalize from the studies' conclusions, due to its qualitative nature and small sample size. Also, we are aware that the creators of the course are likely to be biased regarding its effectiveness. Consequently, we have included an outside collaborator to conduct a joint evaluation of its results.

For future research, we propose follow-up studies with a quantitative approach, especially with regard to the findings on free riding, in order to generalize them to a wider population and transfer the results.

Also, it would be helpful to conduct a controlled experiment, comparable to Camuffo et al. (2020). In such a study, one group of founders (or students) is trained in the design sprint methodology and a control group receives a standard entrepreneurial training. By randomly assigning founders/students to each group, it would be possible to examine the effects of the design sprint methodology on the subsequent success of social entrepreneurs and the learning success of students.

In addition, we aim to continue this program in upcoming semesters to collect more data points on the topic. This will also allow to follow up on groups from the current cohort to determine whether projects are continued beyond the end of the term.

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Creativity in Entrepreneurship Education: Insights from Online Ideation Courses



Stephanie Schumacher and Sabrina C. Eimler

Abstract Creativity is an important resource for driving innovation. The authors show how entrepreneurship is made usable as a key competence for application-oriented adaptation in digital higher education and how new formats of virtual courses for training creativity are designed and implemented. They outline how EntreComp is used as a quality-ensuring framework and how aspects of computer-mediated communication are incorporated.

Keywords Ideation · Creativity · Entrepreneurship education · EntreComp · Digital higher education · Computer-mediated communication · CmC · EXIST-Potentiale

1 Creativity as a Resource for Innovation

Creativity and innovation are driving forces for personal growth, economic development and social progress (Tang, 2017). Not only circumstances such as the COVID-19 pandemic, which have led to disruption in almost all areas of everyday life, but also the accelerated development of digitalization confront the “knowledge society” (Anderson, 2008) with changes and challenges. Creativity, a skill that distinguishes humans from machines and systems with artificial intelligence, makes humans an essential resource for innovation. As an element of entrepreneurship education, it must be given a place in the curricula of higher education institutions to ensure future viability. Additionally, the various associates must be inspired to think creatively and to translate this into the continuous development of new and innovative products or services (Kuckertz, 2013). Suitable teaching

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methods and content must be developed, tested and researched. Like other universities, Ruhr West Hochschule of Applied Sciences (HRW) has set the goal of becoming an Entrepreneurial University as part of its vision for the year 2030. As an element of EXIST-Potentiale – an entrepreneurship-specific funding to support German universities – the HRW designs various education and awareness-raising offers (e.g. *HRWEducate*), which are intended to inspire and qualify all associates at the university to think and act entrepreneurially. The practical conception and implementation of virtual curricular and extracurricular courses for the promotion and development of creative competences – specifically *Ideation*, the focus of this article – is also part of the programme.

2 EntreComp, Creativity and Ideation

The EntreComp Framework (EntreComp) (European Commission et al., 2018) was launched in 2015 with the aim of providing European citizens and organisations with a toolkit to improve their entrepreneurial capacity. It serves as a quality guideline and orientation for the design of the courses described here. EntreComp summarises entrepreneurship as the “ability to use opportunities and ideas to create social, cultural, or financial value for others”. A total of 15 competences (e.g., *Motivation* or *Spotting Opportunities*) in three competence areas (*Ideas and Opportunities*, *Resources*, *Into Action*) represent the building blocks of entrepreneurship (Bacigalupo et al., 2016). Five aspects are assigned to each competency to show what the corresponding competencies can mean in application. The aspect *Develop Ideas* of the competence *Creativity* with promoted learning outcomes corresponds to the *Ideation* learning objectives to be defined and the quality-giving standard on which the courses are to be based. An 8-level progression model is also provided for each aspect (Bacigalupo et al., 2016). With the levels *Basics*, *Intermediate*, *Advanced* and *Expert*, different knowledge and competencies as well as a growing autonomy of learners can be addressed. In line with this, the courses’ aim is to make its content accessible to a diverse group of participants consisting of Bachelor and Masters students with assumed little to no experience in the field of creativity and ideation, as well as lecturers and researchers at the university. Based on that, the learning outcomes are defined as *Basics*. Here, participants should be able to “independently and as a part of a team, develop creative and purposeful ideas that create added value for others” (Bacigalupo et al., 2016).

Ideation is derived from the terms idea and generation and means the creation of new ideas (Cambridge University Press, 2014). In general, an idea can be described as a (creative) thought, insight or a concept of something at a high level of abstraction (Bibliografisches Institut GmbH, 2020). Ideation is associated with and is a part of creativity (Amabile et al., 1996). A variety of definitions of creativity along with their conditions can be found in assorted resources. Runco and Jäger (Runco & Jaeger, 2012) formulate that creativity requires *originality* and

effectiveness. Originality can mean new, unusual or surprising; effectiveness can mean useful, valuable or appropriate. Accordingly, skills for generating original ideas as well as for testing and developing their effectiveness need to be developed to fill those requirements for creative (and purposeful) ideas as defined before. The classic “4P model of creativity” (Rhodes, 1961) offers useful concepts of creativity-related skills and structures which can be deduced by the creation of related courses. The model summarises creativity as the interaction between *person*, *process*, *product* and *press*. Findings point to the importance of *person*-related factors, which could influence promoting creativity (Runco & Kim, 2017): cognitive factors, like flow of thoughts and ideas, sensitivity to problems (Guilford, 1950), divergent thinking (Guilford, 1968) in idea generation, convergent thinking in the selection and further processing of ideas (Kozbelt et al., 2010). From a non-cognitive or personality-related perspective, (intrinsic) motivation can be mentioned, which is described as relevant with regard to creative performance (Amabile, 1983; Csikszentmihalyi, 1990). Affects or personality-related characteristics, like openness (Fehr, 2006), are also considered relevant aspects. The *process* a person creatively thinking goes through can be described, for example, by the “4-phase model” (Wallas, 1926) with the stages preparation, incubation, illumination and verification (Kozbelt et al., 2010). It is also emphasised that individual knowledge in a domain can have an impact on creative performance (Csikszentmihalyi, 1990), though there is no consensus about to what degree knowledge ends up being conductive or obstructive. No to little knowledge could hinder access to a problem or cause rather superficial solutions – too much knowledge could also hinder creative thinking. The *product* reveals the state in which a thought, an idea, takes shape (Rhodes, 1961), as it can be a word, an image, an object or some other form of expression – as an initial idea or as a complex construct. The *press* represents the relationship between the person and the environment (Rhodes, 1961), which is related, for example, to internal factors such as the situational state of mind, and provides a framework for starting points for support. Fredrickson (Fredrickson, 2004) describes the influence of positive emotions on creative performance and mentions joy as one of the components that can increase the urge to be creative (Isen et al., 1987).

3 Structure and Content of Digital Ideation Courses

As part of the HRW training program, three course concepts – considering the elements outlined earlier – with a focus on creativity and ideation were developed and digitally realised. The courses vary in terms of duration, content and objectives and are adjusted for different numbers of participants. Course one represents the two-day extracurricular *HRWEducate* format *Ideation*, which includes the development of ideas with a focus on reflecting on one’s own creative competences. The one-day module *Ideation* – which was offered extracurricular as part of the multi-day *HRW Summer School* – as well as the two-day curricular module of the *HRW Start-up Project* as courses two and three address creativity integrated into a

Table 1 Examples of digital ideation courses at HRW (own illustration)

HRW Educate format Ideation, extracurricular	HRW Summer School module Ideation, extracurricular	HRW Start-up Project module Ideation, curricular
2 × 6 h, planned for 20 participants, 1 instructor, 1 technical support	1 × 4 h, planned for 30 participants, 1 instructor, 1 technical support	2 × 4 h, planned for 30 participants, 1 instructor, 1 technical support
Testing, reflection of creative skills	Developing (business) ideas	Developing (business) ideas
Session 1 <ul style="list-style-type: none"> • Onboarding • Intro (entrepreneurship, creativity, ideation) • Break and energizer • Input, testing and reflection • Break and energizer • Intro (creativity techniques) • Input, testing and reflection • Retrospective and checkout Session 2 <ul style="list-style-type: none"> • Warm-up • Input, testing and reflection • Break and energizer • Input, testing and reflection • Break and energizer • Input, testing and reflection • Retrospective and checkout 	Session 1 <ul style="list-style-type: none"> • Onboarding • Intro (entrepreneurship, creativity, ideation) • Break and energizer • Input, testing and reflection • Presentation of results. • Retrospective and checkout 	Session 1 <ul style="list-style-type: none"> • Onboarding • Intro (entrepreneurship) • Input, testing and reflection • Break and energizer • Presentation of results • Intro (creativity) • Retrospective and checkout Session 2 <ul style="list-style-type: none"> • Warm-up • Intro (ideation) • Break and energizer • Input, testing and reflection • Presentation of results • Retrospective and checkout

methodologically guided innovation process. Here, it must be ensured that (business) ideas can be systematically generated and further developed in subsequent modules. All courses consist of different, alternating *phases* (Table 1) with specific functionalities, all designed with the aim to digitally qualify participants to develop creative, purposeful ideas with added value.

The central unit of the courses represents the phases of *Input*, *Testing* and *Reflection*. Their basic structure is based on overarching principles that can be used to design units to promote creative performance (Scott et al., 2004) and are adapted for the digital context. The unit is (1) designed based on cognitive aspects of creativity (2) which are explained at the beginning and related principles or heuristics and their possible impact on creativity and the generation of ideas are introduced. (3) The theoretical examples are illustrated with real or contextual cases to give participants the opportunity to (4) independently apply and test the principle or heuristic in the context of real problems. Also relevant is the inclusion of (5) regular reflection and correction loops (Gruszka & Dobrocyński, 2017) (e.g. “*How did idea generation work alone/in a team?*”) so that participants recognise their progress and learn to increase their creative self-efficacy (Mathisen & Bronnick, 2009). With a view to the competencies to be developed and derived from the 4 Ps of creativity

(Sect. 2), principles and heuristics are tested and reflected on with the support of creativity techniques. In order to select specific techniques to fit these requirements, it must be concluded that in their entirety they neither have been researched in an all-encompassing manner nor have their effects been sufficiently investigated or proven empirically (Smith, 1998; Wang, 2019). Their conceptualisation is based, e.g. on the assumption of the relevance of different cognitive aspects in the context of creativity and are designed differently from simple instructions to tightly structured procedures (Smith, 1998). Selections can also be made by the assignment to different phases of the creative process, as verbal or silent techniques, based on the type of stimuli, for different problem approaches or individuals or groups (Smith, 1998; Van Aerssen & Buchholz, 2018; VanGundy, 1988; Wang, 2019). For the HRW courses it is tried to offer a variation of different techniques to do justice to different stakeholders and to be able to show their diversity and different approaches. The techniques should also be applicable digitally. In the *HRWEducate* format, the focus is on the testing and reflection of different techniques. STEM education typically does not focus on creativity. Therefore techniques are selected that allow easy access to creative thinking to be able to introduce participants step by step to those thinking styles. Based on this, techniques are explored, first with guidance and then more and more independently. The arrangement of the techniques alternates during the module and needs to be adapted to the participants' experience. In the *HRW Start-up Project* as well as in the *HRW Summer School*, the focus is on the selection of techniques in the context of specific problem approaches and respective need for ideas. Techniques such as *brainwriting*, *why*, *6-3-5*, *reversal*, *morphological analysis*, *SCAMPER* or *nonlogical stimuli* (Van Aerssen & Buchholz, 2018) are part of the portfolio. With the *why method*, the focus is on the analysis of problems (VanGundy, 1988). By asking the question *why* five times, the problem should be abstracted step by step, and thus, the perspective on it as well as the understanding of the solution should be increased. The method is more suitable for statements with a low to medium level of abstraction. The *morphological analysis* is assigned to the analytical-systematic techniques for idea generation. Through an organised decomposition and recombination of, i.e. existing products or processes (Smith, 1998; VanGundy, 1988), it can be used for more complex problems with less inspirational approaches (Wang, 2019). *Nonlogical stimuli* is based on external stimuli such as unrelated pictures, which is intended to inspire idea generation through forced connections (Smith, 1998; Wang, 2019). It is suitable for problems in which unusual ideas are desired or allowed (VanGundy, 1988). As described above, problems are used that have a realistic connection to the participants' lived experience. The offer of choices or the development of personal problems is conceivable to be able to increase an individual fit to the expertise, the interest and thus a possible (intrinsic) motivation (Sect. 2) of the participants. The development of own problems is part of the previous modules of *HRW Start-Up Project* and *HRW Summer School*, so that this can be accompanied and ensured here. In the *HRWEducate* course, it is more relevant to fit those requirements. Since the course involves participants from different disciplines and a bigger number of problem statements are needed. In order to implement real problems (Scott et al., 2004), generally accessible topics

from the higher education agenda or related programmes (e.g. idea awards organised by the university), the 17 sustainability goals of the EU or aspects of trend research can be included. Problem statements with a more general approach can be, e.g. “*Cities are overflowing. Living space is becoming scarce and rents are getting expensive. The situation is also difficult for students. How might we improve housing in cities for students?*” or “*You work in a company and the collection for the new season is to be planned. Your boss asks you to develop new products based on existing ones. Choose an item and develop new product ideas. How might we design...?*” The first problem will be processed with the *technique nonlogical analysis* and the second one with *morphological analysis*. In addition, from Sessions 1 to 2 in the *HRWEducate* format, participants can also be given the task of collecting challenges in their own living environment, which also contributes to the competence *Spotting Opportunities* in EntreComp (Bacigalupo et al., 2016; European Commission et al., 2018).

Besides the phases *Input*, *Testing* and *Reflection*, further phases of the modules must be designed. In *Intros* (Table 1), relevant aspects of entrepreneurship, as well as practical aspects of creativity, ideation and rules of creative cooperation, are presented to contextualise the content and goals of the modules and to give orientation and connection possibilities. Media changes and (positive) tension-generating activities (Plucker et al., 2011) are also planned to stimulate the participants and arouse their attention or curiosity. This in turn should increase the intrinsic motivation to want to be creative. These activities could be integrated, e.g. as *Energizers* or *Warm-ups* during *Onboarding*, after a *Break* or before *Input*, *Testing* and *Reflection* (Table 1), e.g. to get to know each other, to increase attention or to be able to introduce a topic or technique. Examples are *Energizers* such as *Touch Blue* (here, participants must look for objects and show them in front of the camera), *Count up* (participants have to count to ten together without talking) or *Storytelling* (participants have to tell a story together). Finally, learning content, i.e. the phases, must be divided into cognitively processable units. Based on the cognitive load theory (Chandler & Sweller, 1991), it is assumed that a learning unit in a digital context should not be longer than 60 to 90 min, that *Breaks* between 15 and 45 min depending on the participants’ needs should be planned and that participants should be consulted repeatedly about their state of attention and exhaustion in order to integrate shorter breaks of 5–10 min (Table 1).

4 Learning Environment and Atmosphere of Digital Ideation Courses

A supportive, positive environment in which participants feel joy instead of fear or competitiveness (Fredrickson, 2004; Paulus, 2000) is relevant in the delivery of digital courses in the context of creativity and ideation. This should have a positive impact on the creative performance. Likewise, the design of the learning experience

Table 2 Implications in the context of digital learning environment (Johnson & Johnson, 2005; Johnson & Johnson, 2009; Kröger & Reisky, 2005; Lave & Wenger, 1991)

Positive social interdependence	Individual accountability	Interpersonal competence	Requirements for instructor
<ul style="list-style-type: none"> Defining common goals Sharing tasks, resources, role responsibilities: e.g. timekeeping Defining e.g. common identity, group workspaces 	<ul style="list-style-type: none"> Strengthening individual responsibility through, e.g. making individual performance in a group transparent 	<ul style="list-style-type: none"> Strengthening interpersonal competence by, e.g. getting to know each other, trusting each other, support, accurate communication, mutual acceptance, constructive handling of conflicts 	<ul style="list-style-type: none"> Moderation as well as knowledge and optimisation of group processes Motivational skills Planning, organisation, coordination, evaluation Technical support Individual support, reflection

in a group is relevant. To promote collaboration and cooperation, *positive social interdependence*, *individual responsibility*, *beneficial interaction*, *interpersonal competence* and *optimisation of group processes* (Johnson & Johnson, 2009) should be established within a digital learning environment (Table 2). *Working with others* is also part of EntreComp (European Commission et al., 2018). Creative teamwork promotes not only the development of *Creativity*, but also addresses the aspects *Working Together* or *Accepting Diversity* at the same time. This points to the benefit of diverse disciplines for solving multi-faceted issues that represent real-world business teams better. Therefore, it is worth taking a closer look at the framework for further suggestions. In this context, the role of instructors is particularly important, as they should have knowledge about moderation, group processes and motivation as well as planning, organisation, coordination and evaluation of the teaching content and learning experience (Köhler et al., 2008) in a digital environment. As mentioned above, *positive social interdependence* describes that the achievement of an individual goal is only possible through cooperation. This can lead to *beneficial interaction* within a group, for example, sharing thoughts or information and reducing anxiety or stress, which the courses are intended to achieve. *Individual accountability* describes the support of other group members in addition to the fulfillment of one's own tasks. It emphasises the appropriate use of *interpersonal skills* in the context of cooperation, which are to be emphasised and supported by the instructor. Finally, *optimisation of group processes* should serve to reflect on actions in terms of their usefulness as well as to decide which action should be continued or changed to achieve group goals more effectively (Johnson & Johnson, 2009). Personal, preferably individual guidance, support and assessment by lecturers as well as professional competences are also important during the learning experience (Kröger & Reisky, 2005; Lave & Wenger, 1991) and relevant for establishing a supportive, enabling environment. To contribute to the reduction of anxiety, stress or competition, the

Onboarding phase (Table 1) addresses these and presents the courses as judgement-free experimental spaces where mistakes are not perceived as such and where participants can try things out. It also seems important to articulate the difficulty learning and understanding new content while simultaneously performing creatively, and no highly creative results can be expected. This seems to have a positive effect on the participants' expectations. For the comparison of expectations and experiences before and insights after the completion of the modules, a query is useful in *Onboarding* as well as in final *Retrospectives* (Table 1). The evaluation of experiences also contributes to the assessment of how much guidance the participants might need in testing the techniques (Sect. 3). In addition to at least one instructor, it is suggested to involve another person who can provide technical support.

In recent years, digital workshops have shown that the use of a webcam in the context of computer-mediated communication (CmC) is a cause for discussion and that lately a certain "camera fatigue" has set in – presumably due to digital learning in full time. Since CmC is associated with expanded possibilities but also with restrictions compared to face-to-face communication (Döring, 2013), it is supposed that the use of a large number of sensory channels – and thus also the visual one – in the digital context contributes to the success of creativity-promoting modules. Visual contact between lecturers and participants enables, i.e. non-verbal reassurance as to whether the content presented is pointed or the speed needs to be adjusted. In addition, it can support the development of social presence – which is considered important to achieve. Social presence as a degree of salience between communicators (Short et al., 1976) or as co-presence with the perception of the presence of interaction partners (Biocca et al., 2003) in CmC is said to promote a feeling of well-being (Aragon, 2003) or satisfactory interaction between participants (Aragon, 2003; Biocca et al., 2003) and can also be relevant for the achievement of learning goals (Aragon, 2003). Likewise, connections are shown between establishing social presence and solving problems, making decisions and generating ideas (Biocca et al., 2003), which in turn is a central aspect of the courses to be designed. It must be emphasised that especially lecturers are responsible for establishing social presence in digital settings and should have the corresponding knowledge (Table 3).

In the context of media communication behaviour, the results of Walther and Bunz (Walther & Bunz, 2005) are also used for cooperation in virtual groups. Six rules can be established that are important for the structuring of digital courses: (1) starting directly with content or tasks; (2) initiating a regular and frequent communication and (3) immediate and obvious acknowledging of read messages; (4) starting organisational activities and content tasks simultaneously; (5) explicit and verbal communication of thoughts, activities, or actions; and (6) setting and meeting deadlines for tasks.

Table 3 Requirements and implication in the context of social presence (Aragon, 2003)

Course design	Requirements for instructor	Participants
<ul style="list-style-type: none"> • Send welcome message. • Include student profiles. • Limit group size to no more than 30 people. • Integrate and structure activities in the context of collaborative learning. • Incorporate audio. 	<ul style="list-style-type: none"> • Conveying familiarity (Argyle & Dean, 1965), e.g. positively understood facial expressions, eye contact, personal communication. • Establishing immediacy (Wiener & Mehrabian, 1968), e.g. non-/verbal communication, e.g. appropriate style of dress, form of expression (Short et al., 1976). • Responding promptly to mails (Newberry, 2001)/contribute to discussion boards/provide frequent feedback. • Individualised address (Hackman & Walker, 1990)/provide options for addressing instructor/strike up conversations. • Sharing personal stories/experiences/humour (Hackman & Walker, 1990)/emojis. 	<ul style="list-style-type: none"> • Responding promptly to notifications (Newberry, 2001). • Sharing personal stories/experiences/use of humour (Hackman & Walker, 1990) and emojis. • Contribute to discussion boards.

5 Use of Tools in Digital Ideation Courses

Content is taught using digital media and computer-mediated communication. The focus is on creating an environment that promotes, e.g. creativity, social presence, positive social interdependence and application-oriented conditions. Due to their fit with the factual and social requirements of communication tasks mentioned above, the combination of *WebEx* as a video conference tool and *Miro* as a digital whiteboard (Table 4) is chosen for the course design. The video conference tool enables different sensory channels (video, text, sound) to be addressed and synchronous communication to one or more people. This activates, e.g. the exchange of information (e.g. for *Intro*, *Onboarding* or *Retrospectives*), the sharing of thoughts or ideas (e.g. for *Testing*) or immediate feedback (e.g. *Reflection*). Using many sensory channels could also be relevant for establishing social presence. Sharing a screen allows the text- or image-based communication of knowledge (e.g. *Intros*) or work results. An important functionality of the tool is the allocation of participants in small groups to enable teamwork. Digital testing of creativity techniques requires an additional tool. In face-to-face contexts, it can be realised via whiteboards and sticky notes. It is assumed that this should also be reproduced digitally. In this context, e.g. *Miro* complements the video conference tool as a common surface for testing creative skills of the participants, for recording and visualising information, thoughts and ideas, e.g. during *Testing* or *Retrospective*. The individual phases of the courses

Table 4 Guideline for implementing the individual phases of digital ideation courses (own illustration)

Phase	Content	Requirements	Media
Onboarding	Who is who? Competences, expectations, experiences in ideation, creativity, entrepreneurship	e.g. building personal trust, social presence, establish interaction and positive environment, reducing fear, learning about knowledge, intrinsic motivation	WebEx and Miro
Intro	Creating context, preparing working phase, defining goals	e.g. building creative self-efficacy, expertise, raising awareness of 4 Ps	WebEx
Input, testing	Define principles, illustrate heuristics via examples and testing on real problems with creativity techniques	e.g. testing and reflecting personal competences, building trust and creative self-efficacy, enabling positive social interdependence	WebEx and Miro
Reflection	Focus on different aspects, e.g. techniques, cognitive aspects, group work, creative process	e.g. reflecting intrinsic motivation, creative self-efficacy, group processes, individual accountability, or interpersonal competence	WebEx and Miro
Energizer, warm-up	e.g. after breaks	e.g. motivation, activating, optimising and initiating group processes and interaction, reducing fear, establish positive atmosphere	WebEx or Miro
Retrospective, checkout	Overview and connection options to further formats	e.g. reflecting learning progress/path, evaluating expectations and results	WebEx and Miro

are visualised as a learning path as a supplement to the content presented via *WebEx*, which is intended to provide orientation for the participants and to show their progress (Fig. 1).

6 Evaluation

Within the framework of the course evaluation, a comprehensive picture of the participants' experience and the impact of the module on the participants' qualification in the context of creativity and ideation was to be collected, which also serves the further development of the courses' structure and content. After completing the courses, the participants were asked to answer an online questionnaire that was made available to them via SoSci Survey. The questionnaire contained 36 statements assigned to eight indices, most of which had to be answered on 5-point Likert scales (1 = strongly agree, 5 = strongly disagree), as well as two general, four sociodemographic and three qualitative questions. An excerpt from the item battery

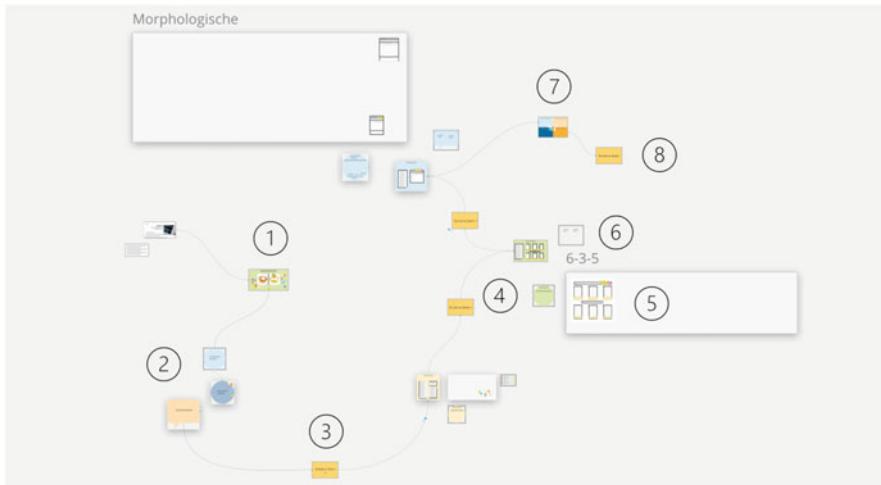


Fig. 1 HRWEducate format. Session 1 with learning path on Miro: (1) Energizer, (2) Onboarding, (3) Media change, (4) Problem statement, (5) Testing and (6) Reflection on 6-3-5, (7) Retrospective, (8) Checkout (own illustration)

is shown in Table 5. The quantitatively collected data of the evaluation were first analysed descriptively with SPSS. The one-sample t-test was then to be used whether there is a significant deviation from the scale centre in one direction of the scale ends. Qualitatively collected data were evaluated with a qualitative content analysis, which is categorised in terms of the theoretical constructs or indices mentioned in Table 5.

7 Conclusion and Prospects

In general, the content of the courses seems to have a positive impact on the creative qualification of the participants referring to EntreComp (Bacigalupo et al., 2016; European Commission et al., 2018). This can be inferred, e.g. from the reported creative self-efficacy of the participants. However, as this is a subjective assessment, further analysis needs to be undertaken to assess creative performance along larger samples. In particular, the difficulty is measuring creativity and therefore being able to say whether a measure is effective or not. Thus, factors that influence an increase in creative performance need to be further researched. Participants seemed to evaluate the generation of ideas better in a team than alone. In addition, the participants were rather reserved about the general digital realisation of courses in the context of creativity and ideation. Feedback shows that the participants had the expectation that ideation would work better in an analogue setting than digitally. Interestingly, Jensen et al. (Jensen et al., 2018) show that both digital and analogue settings can support ideation and collaboration which may indicate that digital as

Table 5 Item battery (excerpt) (own illustration)

Theoretical constructs/ indices	Items	Example	M	SD	p
Qualification of the participants, EntreComp, <i>Basics</i> level (2) (Bacigalupo et al., 2016; European Commission et al., 2018)	4	How did the course help you develop your competencies and skills to generate ideas on your own?	4.6	0.65	<0.005
Creative self-efficacy, 7-point Likert scale (Mathisen & Bronnick, 2009; Tierney & Farmer, 2002)	3	I have confidence in my abilities to solve problems creatively.	6.13	0.69	<0.002
Motivation	3	The module made me want to continue working on ideation.	4.8	0.18	<0.000
Structure	8	The instructor has balanced theory and practice well.	4.58	0.53	<0.003
Content (interestingness, relevance)	4	The instructor made the module interesting.	4.6	0.38	<0.001
Content (difficulty and scope)	2	The scope of the module was	3.00	0.00	
Learning environment and atmosphere	6	I felt comfortable during the entire duration of the module.	4.87	0.30	<0.000
Digital tools and realisation	6	I liked working with the Miro board.	4.13	0.25	<0.001
Recommendation of the course	1	Probability to recommend the course to others.	4.6	0.55	<0.003
Overall course rate	1	Grades 1.0–5.0	1.4	0.55	<0.003
Sociodemographic information	4	Age, gender, subject area, profession	e.g. age 25.4	e.g. age 3.78	
Qualitative questions	3	I liked on this module....			

well as analogue ideation can work. The starting point here would be to conceptualise and test hybrid and face-to-face formats in comparison to digital courses. The use of digital tools, the interestingness and relevance of the content and the structure of the modules were emphasised. Only the general module length and self-experience phases tended to be questioned: some found them just right, others too long, and others too short. Here it would be interesting to find out which factors influence the different perceptions to be able to derive options for improvement: breaks, duration of learning units, interest and motivation, or embedding of modules? Besides, the learning environment and atmosphere in the courses was positively highlighted. It was rated as important for the success and well-being of the participants and was created through interaction with and by the facilitators. In addition, the courses were taught by female lecturers, which was also highlighted as positive by the participants. Gender characteristics and competency-based development in the context of entrepreneurship are relevant and widely researched fields

that can receive more attention. Looking at the embedding of the learning content, ideation is mostly located in the early phases of innovation. In this phase problems and initial ideas are defined, and the way is paved for further developments. In the *HRWEducate* format, this could be done independently of other modules. Integrated, e.g. in the *HRW Summer School*, this poses a challenge for the instructor and participants: problem definition, idea generation, team building and content maturation have to run simultaneously and a defined connectivity for subsequent modules need to be achieved. Especially here, the instructor should have sufficient professional and creative competence to support the development and deepening of individual ideas to such an extent that a qualitative connection to subsequent modules can be guaranteed. In conclusion it can be said that participants with little to no experience in the topic area had an increased motivation after completion of the courses, e.g. to want to take part in further courses. It would be interesting to investigate how this motivation can be promoted in the long term in a university context, e.g. by designing further formats such as network or idea platforms. Although only a selection of courses in the context of entrepreneurship education is presented here, starting points for the further development of learning offers as well as for research activities can already be identified. There is great potential to integrate creativity and ideation more strongly into institutionalised processes and curricular topics of higher education institutions. This would be a contribution to the development of innovations, enabling the participants to deal with change and even to initiate it on one's own for personal growth, economic development and social progress (Tang, 2017).

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Belonging in Entrepreneurship: The Cascading Benefits of the Accelerator Rap Approach



Betsy Campbell

Abstract Drawing upon Accelerator Rap – the course that won the 2020 Academy of Management Innovation in Entrepreneurship Pedagogy Award – this chapter explores constructionism before describing the rationale and process of the course. It then suggests ways to bring a constructionist approach to the structure and content of other entrepreneurship courses in order to foster greater diversity across the entrepreneurial ecosystem. It is designed for readers who are interested in issues of diversity in entrepreneurship and who would like entrepreneurship education to be more inclusive.

Keywords Constructionism · Diversity · Reflective practice · Innovative entrepreneurship · SchoolHouseRock

1 Introduction

More than 30 years have passed since Seymour Papert minted the term constructionism, a way of building knowledge through the construction of artifacts in social and reflective contexts (Papert & Harel, 1991). While once a radical stance, constructionism has become commonplace in educational settings. Entrepreneurship education has embraced the idea of learning by making in social contexts primarily by providing scaffolding for students who are creating new ventures. These courses foster learning by giving students experiences that approximate the actions of founders. Socially informed acts of prototyping and pivoting, for example, are often significant aspects of the curriculum (Roy et al., 2020). Students intent upon starting ventures can find immediate benefits from such educational experiences. However, students who do not see themselves in entrepreneurial careers may not enroll and may miss out on the opportunity to discover and develop their entrepreneurial abilities.

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The Accelerator Rap course differs from most entrepreneurship courses. This course, which won the Academy of Management Innovation in Entrepreneurship Pedagogy award in 2020, attracts undergraduates who are more interested in the arts, liberal arts, and education than they are in entrepreneurship. The course guides these undergrads in the construction of educational media designed to help 8–12-year-old girls and children of color see themselves in innovative entrepreneurial careers. The students learn about entrepreneurial practices and the demographics of the entrepreneurial ecosystem while working on the fundamentals of educational media, animation, and beat-making. They demonstrate their mastery of entrepreneurial concepts by developing short, educational, animated, music videos for children. In the process, the students learn about entrepreneurial practices, and they recognize that they, too, could embark on innovative entrepreneurial careers. In addition, the inclusive media works that they have created are offered as open-source learning materials for K-12 settings.

As the creator of the Accelerator Rap course, I start this chapter by describing the rationale for the course before highlighting the pedagogical anchors for it. After presenting an overview of the course, the chapter suggests several ways to re-envision the structure and content of other entrepreneurship courses in order to promote greater diversity in entrepreneurship. It concludes by underscoring the value of constructionist learning opportunities in entrepreneurship.

2 Rationale Behind the Accelerator Rap Course

Entrepreneurship is gendered and racialized (Jones & Warhuus, 2017). It also is discipline-specific, with the tightest alignments existing with business and engineering (Huang-Saad et al., 2020). These broader societal and cultural cues about the gender, race, and primary interests of entrepreneurs together form a discourse of entrepreneurship that can be a barrier to some students (Sarasvathy, 2004). Some entrepreneurship coursework is a part of this discourse that inhibits students outside of the dominant group(s) from participating in entrepreneurship education.

Entrepreneurship education has evolved since the 1990s when very few universities offered either formal or informal entrepreneurial learning opportunities. It has transformed from teaching how to start a business by writing a mostly fictional business plan in a classroom setting to cultivating entrepreneurial skills in experiential settings (Ferreira et al., 2018; Kickul et al., 2018; Nowinski et al., 2019). Experiential learning opportunities that approximate the tasks and practices of entrepreneurial work are considered especially efficacious (Honig, 2004; Brush et al., 2015). Despite the changes, entrepreneurship education primarily aims to prepare students to start ventures. This is a boon for students who are aspiring founders, but it is a barrier for students who do not resonate with the cultural discourse about entrepreneurship.

Designing a course that embraces all students requires meeting students where they are (Bartolome, 1994) and providing ways for students to exercise the skills that

they want to develop while exposing them to entrepreneurial essentials. Such a course needs a classroom environment that enables learners to build new insights about entrepreneurship while engaging in projects that overlap with their core interests. These learning activities necessitate a project-based approach that connects the conceptual learning of individuals with a diverse community of learners (who may or may not resonate with the dominant identities of entrepreneurship). Constructionism (Papert, 1993) offers a theory of learning and a strategy for education that invites people to build personally meaningful artifacts in conversation with a wider community.

3 Pedagogical Anchors for the Accelerator Rap Course

Constructionism's main idea is that the most effective leaning experiences include the active creation of meaningful artifacts, interactions with others, and reflections on one's own learning and thinking. In other words, conceptual learning occurs when learners construct personally meaningful artifacts that are shareable within a community of reflective learners (Papert, 1993). Constructionist learning, then, is deeply situated, practical, and dynamic (Ackermann, 2001). As Papert (Papert & Harel, 1991) put it: "Constructionism—the N word as opposed to the V word—shares Constructivism's view of learning as 'building knowledge structures' through progressive internalization of actions... It then adds the idea that this happens especially felicitously in a context where the learner is consciously engaged in constructing a public entity, whether it's a sand castle on the beach or a theory of the universe."

Unlike Piaget's constructivism, which places learning in the mind, Papert's constructionism prioritizes the concepts of engagement and externalization (Papert & Harel, 1991). Constructionism is not just experiential learning or learning by doing. It involves conscious engagement, personal and communal reflection on activities and insights. Both the creation process and the artifacts created need to be embedded in practices of social sharing and review. The possibilities for the artifacts, or "public entities," are bounded only by the creativity of the learners. They only need to have personal meaning for the learners. In many entrepreneurship courses, the public entities under construction are ventures, but these are only meaningful for students who yearn to be founders. The artifacts under construction can take many forms, including media works. The purpose of these artifacts is to give students "objects-to-think-with" – "objects in which there is an intersection of cultural presence, embedded knowledge and the possibility for personal identification" (Papert, 1980) that catalyze new insights and knowledge for the student.

Constructionism prioritizes student-centered, discovery-based learning where students use their existing interests and knowledge to build new insights and abilities. Learning happens as students engage in project-based activities that help them make connections between different ideas. While these connections are developed in the mind of an individual learner, they are dependent upon interactions with

others, including peers, teachers, and people in the wider community. Consequently, constructionism is not only a means for an individual to build knowledge by creating artifacts; it also is a way to cultivate a social context (Ackermann, 2001).

Because interactions within a social setting forge a sense of belonging and create a community of learners (Papert, 1980), the role of the constructionist teacher is more facilitator than lecturer. As a kind of coach, a teacher helps students consider challenges in fresh ways and learn how to productively critique and support each other's work. Teachers need to accommodate different learning styles, paces, and ways of presenting knowledge (Turkle & Papert, 1991) as students bring an array of abilities and interests to a project. Constructionist teachers create a productive context for learning and look for teachable moments. They orchestrate opportunities for students to discuss, share, and interactionally collaborate on the formation of new ideas while working on their projects (Resnick, 1996).

Projects that use media as artifacts to learn with are well aligned with constructionist priorities. People engage deeply with core topics in order to craft media that communicate key points. This process of engagement leads to a strong understanding of the subject (Jonassen et al., 1999). By creating media (as opposed to just consuming prepared media), students actively communicate their new ideas and insights as they develop visual and audible content. The media also can be shared with others and discussed in an iterative cycle of design and learning. As students represent their new understanding in multiple forms and over a few iterations, they develop metacognitive, reflective, and communication skills (Chen & McGrath, 2003; Garthwait, 2007).

Whether students construct media or a different artifact, the main principles of constructionism (Papert, 1990) apply:

- Student learning is optimized when learning activities are connected with something each learner finds relevant and meaningful.
- The artifacts that students construct are dynamic materials (or technologies) that invite interaction, reflection, and discovery.
- Projects are designed to be intrinsically enjoyable for learners in order to inspire the sustained concentration required.
- Projects are organized to help students learn how to learn.
- Teachers serve as facilitators of self-directed learning rather than as instructors.
- Mistakes are occasions for learning over time.
- Competence with technologies and communication skills are fundamental abilities.

The complexity of constructionist projects means that students will be engaged in the work over an expanse of time. Given the self-directed nature of the learning process, students need to have or develop time management skills. They also need to have or develop a perspective that any mistakes or false starts are simply occasions for learning, for gaining a richer perspective. Fluency with digital technologies and with communication are essential, and students will build their abilities in these areas during the project.

Using media as the artifact under construction is rare in entrepreneurship education. However, this approach is central in the Accelerator Rap course. The next section describes how media creation organizes the constructionist nature of the course.

4 Structure and Flow of the Accelerator Rap Course

The Accelerator Rap course is orientated around constructionism (Papert & Harel, 1991; Papert, 1993). Students create short educational animated music videos designed to teach entrepreneurial concepts to 8–12-year-old children in inclusive ways. As such, the course attracts undergraduates who want to render animations or make beats and may not be interested in innovative entrepreneurship. The curriculum encourages students to examine their assumptions about founders and to consider aspects of diversity in entrepreneurship while they explore entrepreneurial cases and concepts. Students reflect on their ideas about entrepreneurship as well as about race, gender, and age as they render the videos for the course project. The course concludes with a public showing of the completed works.

Each session of the class over the arc of a semester begins with students engaging in a thinking routine (Ritchhart & Perkins, 2008) designed to help students synthesize knowledge. They are given a prompt (e.g., what are you sure you know about entrepreneurial work right now, and what would you like to know more about?) and 2 min to record their private responses. Students are expected to keep their responses to these exercises in a single paper notebook or a single digital file across the entire semester. At the midpoint of the semester and in the next-to-last class session, students reflect on the development of their thinking and share pivotal moments in the development of their ideas with classmates.

After completing the thinking routine, a typical class session includes a section focused on discussing relevant topics and a section focused on developing relevant content. Students arrive in class having watched or read content, shared reactions to that content in an online forum for the class, and responded to each other's contributions. In the class session, we pick up the conversation and grapple together with puzzles that the students have identified. On occasion, a guest expert joins the class session to bring additional perspectives or to offer advice on the development of the students' media projects.

Class sessions call on students to bring their full focus to the time together. While parts of the class have students seated around a table, every session also gets them in motion. Some activities have everyone at the whiteboard or moving in a circle around the room. These embodied exercises often ask students to tap into creative forms of expression. For example, they quickly draw a tableau or write a short rhyme related to our entrepreneurial topic on the whiteboard. The time limits prevent students from over-investing in the improvised exercise, and they enjoy rotating to another student's quickly-rendered work where they add to it, again within tight time limits. The group then discusses what surprises they found in each other's work and

how these different interpretations will help them construct their formal media projects.

Some class sessions are held in contexts outside of the usual classroom. We would visit the campus accelerator and discuss matters of entrepreneurship and diversity with the person who runs it. We would visit the university's media commons and learn about the concept of rapid prototyping by using robotics kits in teams. We would visit an on-campus recording studio and workshop beats and lyrics with an expert in music composition and recording. The final minutes of each of these miniature field trips are devoted to reflecting on the experience and articulating how it could contribute to each student's educational animated music video.

Class sessions also are devoted to the development of students' formal media projects. In these sessions, students could ask each other for guidance and critiques. The interactions from these sessions inform a class-designed rubric that students use to evaluate their own and other students' media works.

The final class session is designed to be a public showcase. Faculty, friends, and even members of the local media are invited to see the media pieces designed by the students. With each student positioned at their own large screen around the room, they take turns describing the learning that they have done over the semester and present their videos to the guests.

While the content and guest experts change from semester to semester, the flow of the course remains constant. Whether the topics we explore are lean startup, lead user innovation, or some other entrepreneurial practice, the students are challenged with creating inclusive media pieces that can help children see themselves in innovative entrepreneurial careers. In addition to introducing entrepreneurship to undergraduate students who had little interest in entrepreneurship at the start of the semester, the Accelerator Rap course also generates artifacts that can be used to inspire girls and children of color. The next section builds on these possibilities for impact.

5 Extended Impact of the Course

The constructionist orientation of the Accelerator Rap course enables it to influence the diversity of the innovative entrepreneurial ecosystem in three ways. First, it brings students into a course about innovative entrepreneurship who would otherwise not take such a course. Second, it helps these undergraduates recognize misperceptions that they have been holding about entrepreneurs and entrepreneurial work. This means that students can begin to identify with innovative entrepreneurship and see the ways that their skills could contribute. And finally, the inclusive animated music videos that the students create are made available as open-source learning materials for K-12 settings, after-school programs, and families.

Undergraduate students can receive credit in Art, Education, English, Music, or the Entrepreneurship Minor in Communications by taking the Accelerator Rap

course. This ensures that students from diverse disciplines enroll in the course. Consequently, many students may be more interested in the artful nature of the course project than the topic of entrepreneurship. Some are motivated to have a polished media piece in their portfolio before graduation to show off their creative ability to future employers, for example. Nevertheless, these students who are not initially very interested in entrepreneurship begin to see themselves as potential innovative entrepreneurs as the semester unfolds.

At the beginning of the course, students are asked to describe who entrepreneurs are and what entrepreneurs do. This exercise reveals that many students come to the class with preconceived ideas based on popular culture and common myths. For example, some students think that an entrepreneur is “sunglasses-wearing guy with an attitude in a nice office” or that entrepreneurship is “only about making money” or “telling people what to do.” When students at the start of class are asked to name innovative entrepreneurs, they tend to name only white American men (e.g., Steve Jobs, Bill Gates, etc.). The course actively challenges these perceptions of entrepreneurship and builds cultural consciousness by asking students to begin to recognize the limitations of their own assumptions. It also exposes them to examples of successful innovative entrepreneurs who represent nondominant population groups.

Over the arc of the semester, students share that they had once thought only people majoring in business or engineering could start innovative ventures or lead companies. Entrepreneurship in their academic homes tends to be focused on self-employment (i.e., making money as a freelancer). Only through the construction of the educational animated music videos designed to help 8–12-year-old girls and children of color see themselves in innovative entrepreneurship do some of the undergraduates recognize their own capacity to become innovative entrepreneurs.

The media artifacts that the students create are made freely available to the wider public. Students who wish to share their videos can place them in an online gallery that is promoted to K-12 teachers. Entrepreneurship education in the United States starts in elementary schools in some states (Junior Achievement USA, 2015), and inclusive learning materials are needed. Today’s 8–12-year-olds are familiar with electronic devices such as smart phones and digital services such as YouTube for Kids. Even 5–8-year-olds (in pre-pandemic conditions) spend an average of 3 hours a day looking at a screen of some kind (CommonSense Media, 2021). Having online entrepreneurial learning materials that represent female founders and founders of color is important.

The artifacts also lend themselves to research. Studies are in design phases to examine the impact the artifacts have on children’s impressions of entrepreneurial identities and entrepreneurial work. Special interest lies with the ways that the videos may influence the ways that girls and children of color, in particular, think about entrepreneurship.

While the Accelerator Rap course models several ways that entrepreneurship education, and in particular, constructionist entrepreneurship education, can address the lack of diversity in innovative entrepreneurship, it is just one course. Other constructionist contexts also can spark this kind of deep learning and cultural change. The next section explores additional ways that entrepreneurship education

can embrace constructionism and help more learners discover innovative entrepreneurship.

6 Reinventing Courses to Promote Greater Diversity in Entrepreneurship

The Accelerator Rap course is based on several key ideas about learning:

- Knowledge and competence are created by students as they develop new and situated ways of understanding entrepreneurship.
- Ideas, information, and insights are made meaningful as students integrate them into their existing frames of knowing and communicate them in the media projects.
- Learning is a social process that involves explanation, (re)negotiation, sharing, and evaluation in many forms.

As students craft their educational animated music videos about entrepreneurship, they conceptually and practically (re)organize their ideas about entrepreneurs and entrepreneurial work. As they share their emerging and then finished artifacts with peers and others, they yet again need to reflect on and make sense of their learning process and project. An essential feature of the course is that the learning is connected to the interdisciplinary and social creation of the videos. However, the artifact under construction does not need to be an animated music video. It can be nearly anything that requires the practices and skills of disciplines beyond business.

An important challenge for educators who orchestrate constructionist learning contexts is the identification of artifacts for students to craft. Depending on the departments within a particular university, the artifact could call on students to choreograph a ballet or other forms of dance to convey an entrepreneurial concept. Alternatively, the artifact could require students to design a board game or a video game based on an entrepreneurial case. Or the artifact could focus students on writing a play or shooting a movie (documentary or fact-based fiction) about entrepreneurship. In each of these options, the final session for the course could be a public display of the artifacts through a performance, a community game event, or a screening.

Related to this challenge of defining the artifact is the need for the educator to identify the tools and structures that can support students as they engage in the construction of their artifacts. Faculty members across the university and community members with relevant expertise can be part of the coaching team. They can speak in class or react to emerging artifacts with constructive feedback. Various student services available on campus – such as a recording studio or a media commons, in the case of Accelerator Rap – provide physical tools and software that contribute to the construction of the artifacts.

Because constructionist educators are facilitators more than instructors, each class session needs to be designed as a workshop or lab. Lectures have a role, but only as a way of framing discussions. Similarly, assignments between classes need to be structured in ways that prime in-class discussions and ideally include interactions between students in advance of class sessions. Students actually can participate in the creation of assignments; they can be asked to find learning materials to critique and discuss. Such assignments can tap into students' sincere interests and help them render their unique artifacts.

One of the tenants of constructionism is the importance of learning how to learn, and reflection offers a way to encourage this. Reflection can come from introspective thought and private journaling (Schön, 1987). It also can emerge from reflective dialogue in person or in online contexts. Using learning routines in class sessions and structuring assignments to include reflective dialogue give students ways to synthesize information while both individual and group learning. However, that is just one option. Educators must design learning experiences and assignments that guide students to reflect on knowledge, activities, puzzles, and discoveries while communicating ideas and feedback with each other.

By working across disciplines and constructing inclusive artifacts designed to be consumed by others, constructionist entrepreneurship courses are poised to make the entrepreneurial ecosystem more diverse. They offer a welcoming on ramp for undergraduates to explore entrepreneurship who are based outside of business or engineering. The artifacts reach others in the wider community and, again, serve to attract more people from more diverse backgrounds to entrepreneurship.

7 Looking Forward

The lack of diversity in the innovative entrepreneurial ecosystem is a recognized problem. Simply making more opportunities for people to experience traditional entrepreneurship education does not necessarily engage women, people of color, and other people who are underrepresented in innovative entrepreneurship. Instead of offering more instances to teach traditional courses, we need to design and facilitate different learning experiences.

Constructionist courses promise a path to greater diversity throughout the entrepreneurial ecosystem. Such courses leverage the different skills and real-world experiences of students. Because they build on the interests and abilities that students prioritize, constructionist courses attract new students to entrepreneurship. The range of perspectives, needs, and experiences that these new students bring to the course make the learning experience richer for everyone, including the educator.

The educator's role in constructionist courses is to help students learn how to learn – and discover how their authentic interests and skills are aligned with innovative entrepreneurial work (Papert & Harel, 1991). Students can participate in the creation of assignments and evaluations. The learning experience emerges

through in an ongoing conversation, online and in person, and in exhibitions of student thinking through the creation of artifacts.

In the Accelerator Rap course, students gain a working understanding of innovative entrepreneurship and develop skills they had hoped to polish as well as some they never expected to have. This was the result of a bringing constructionist approach to entrepreneurship education. The course attracted new and different students to entrepreneurship. It also offered sufficient learning materials, support structures, interactional opportunities, and reflection prompts to help students to learn how to learn and to see themselves as future founders. The Accelerator Rap course demonstrates one way to embrace constructionism in contexts for entrepreneurship education that value diversity. However, the ways that entrepreneurship education can make use of constructionism are limitless.

Note: More detailed information about the Accelerator Rap course has been available at <https://sites.psu.edu/cape> and <https://sites.psu.edu/challenge>.

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“If You Want to Work Fast, Go Alone. If You Want to Go Far, Go Together: A Case for Shifting Entrepreneurship Education Towards Team-Based Trainings”



Theresa U. Zimmer and Nida ul Habib Bajwa

Abstract Building up entrepreneurial ecosystems has become vitally important for higher education institutions across the world. Be it to tackle high numbers of unemployment amongst the youth, to drive innovation or leverage upon the strengths of particular individuals, it is key for a long-term transformation of societies to build support structures that would enable entrepreneurial thinking and acting to flourish. Therefore, nowadays, it is rare to find higher education institutions across the world that do not offer some sort of entrepreneurship education program. Be it in the form of elective or mandatory courses, short courses on individual topics at incubators, or specialized degree programs, such programs have become an integral part of higher education institutions' strategy to equip their students with the transversal skill of entrepreneurship that is deemed relevant for all students, irrespective of their professional background. Especially entrepreneurship education approaches have gained a lot of interest from researchers, as with an increasing number of programs there is a need for systematically understanding the pros and cons of different approaches. Apart from the plethora of approaches, starting a business is not a straightforward project. Much more often it is a long-term process with many twists and uncertainties that need to be tackled. Aspiring entrepreneurs face different challenges that are related to different developmental stages of their business ideas. Therefore, entrepreneurship education also needs to address the students' needs that arise in these different stages.

Keywords Team-based entrepreneurship trainings · Entrepreneurial teams

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1 The Importance of Entrepreneurship Teaching and Training

Apart from different stages of starting a business that one could try to work on, fundamentally the first step in entrepreneurship education that needs to be achieved is to actually create and/or increase the intention to start a business. It is a common consensus amongst entrepreneurship researchers that the intention for starting a business drastically increases the likelihood to actually start a business. Therefore, the aim of entrepreneurship education activities that are linked to the first stage of starting a business has to focus on raising the entrepreneurial intentions amongst students (Nabi et al. 2017). This is especially important for countries with lower overall intentions to start a business (Bosma et al. 2020), but it is also relevant for higher education institutions' strategies on how to raise awareness about entrepreneurship being a viable alternative to standard employment after graduation. The extent to which such awareness-raising formats for entrepreneurship are embedded within higher education institutions' teaching and training varies a lot across institutions and countries. It seems plausible that if raising awareness is the goal, then such courses need to be offered to not only business students, but need to be attractive to students from all disciplines. Recently, some countries, such as Jordan, have gone even a step further and have legislated that higher education institutions have to offer mandatory introductory entrepreneurship courses targeted at giving a broad overview over almost all aspects of establishing a business, e.g., market analysis, business planning and marketing strategies, and creativity methods. Therefore, students should get an overview of the field of entrepreneurship and start to develop an entrepreneurial mindset.

Even with entrepreneurship education formats that aim at creating or raising intentions to start a business, there is a case to be made for more competency-based education that goes beyond traditional teaching approaches of entrepreneurship that focus more on theories than on application. After all, remembering theories on entrepreneurship and its different stages might just have the opposite than intended effect on students' thinking about starting an own company. In order to develop an entrepreneurial mindset and actually start an own business, the knowledge of strategies and tools can be helpful; however, it is at least as important to also focus on emotional and behavioral aspects (Kuratko et al. 2021). These findings seem plausible, having in mind that starting a business is a dynamic and often stressful process. Therefore, some example competencies to be trained are proactivity, as well as motivation and perseverance (Bacigalupo et al. 2016). Research findings show that such competencies can be developed in applied project-oriented courses (Lange et al. 2014). For example, a lot of project-oriented courses focus on entrepreneurial experiences, through which entrepreneurial competencies can be developed. Such experience-based approaches can, for example, help students get an immediate feedback on their business idea and thereby assist in the development of entrepreneurial competencies. Studies show that these courses

are likelier to increase the chances of establishing a successful business (Frese et al. 2016; Galvão et al. 2018).

Apart from entrepreneurial competencies that are usually taught and trained in entrepreneurship education formats, there are researchers that have started focusing on training individual psychological factors that might impact the success of a business (Frese et al. 2016). For example, one of the most predictive factors for following through with a business idea is self-efficacy. Rauch and Frese (2007) have shown that business creation and success are likelier if the entrepreneur believes in the success of his own entrepreneurial activities. Based on these findings, a six-step training concept was developed and tested that incorporated students' learning of entrepreneurial knowledge and demanded the performing of activities to start a business(Rauch and Frese 2007). This training was tested with over 400 Ugandan students in an experimental-control group design and results indicate that indeed business creation could significantly be increased. Although these formats do a very good job focusing on individual future entrepreneurs and their practical as well as psychological skills, there is the important factor of teams that has not been considered in entrepreneurship education formats so far. This is astonishing as new businesses are rarely founded by a single person and mostly require a team effort (Kamm et al. 1990; Klotz et al. 2014; Schjoedt and Kraus 2009). But the aspect of teams not only gains relevance at the final stage of actually starting and maintaining a new business. There is no specific point in time for starting to cooperate with others in the entrepreneurial process. Some entrepreneurs are walking alone for a long time before they realize that a cofounder or more team members might represent an enormous pool of new resources and therefore increase the probability of business success. Thus, the ability of working together with people from different backgrounds only becomes more and more important.

2 The Importance of Training Entrepreneurial Teams

It is worth to note that successful teamwork, not only in entrepreneurial teams, is often seen as a given, yet there is a plethora of evidence that suggests the opposite (de Mol et al. 2015). Apart from just forming a team, it is necessary to work on team development for entrepreneurial teams, especially because most team members might be focused solely on external environmental factors, such as market demands or financial resources, and might neglect the challenges within the team. And there are many challenges a young team faces, e.g., a lack of knowledge about each other's strengths and weaknesses, a lack of role clarity, AND a lack of standardized procedures and processes for effective teamwork. Given these challenges, it comes as no surprise that many young businesses do fail because of their team (Knight et al. 2020) and it seems plausible that focusing on improving teamwork might reduce many misunderstandings and conflicts and help entrepreneurial teams to establish a productive and effective organizational culture. In addition, it is not only a productive organizational culture that leads to entrepreneurial success. A big challenge for

entrepreneurs is adapting to fast changing circumstances and taking decisions in an environment characterized by high risk and uncertainty. The potential of developing creative problem-solving strategies increases when an entrepreneur does not have to solely rely on his/her own ideas. An evidence-based entrepreneurship education format that focuses on teams might assist in reducing the number of entrepreneurial teams that fail and enable them to make use of their joint potential.

Interestingly, many studies have focused on reasons for why some entrepreneurial teams are more successful than others. There is common consensus amongst researchers that entrepreneurial teams should perform successfully, once they have developed a collective cognition about each other's personal characteristics and their collaboration within the team for the business project itself. Therefore, uncertainty about characteristics and behavior within the team would be reduced. This so-called entrepreneurial team cognition is "[...] the product of team experiences and team processes [...]" and is defined as an "emergent state that refers to the manner in which knowledge is mentally organized, represented and distributed within the team [...]" (de Mol et al. 2015). Thus, an entrepreneurial team collects information about the ability of the whole team during the time they are working together and the information gained is shared across the team members. Recent findings go even one step further and indicate that not only knowledge about the team's abilities are key for successful performance, but the belief in the abilities themselves. This collective belief is also called team efficacy and findings assume that team efficacy might be a very important predictor of entrepreneurial success on the group level just as self-efficacy is on an individual level (Chowdhury 2005; de Mol et al. 2015; Dimov 2007; Ensley and Pearce 2001). Therefore, similar to entrepreneurial self-efficacy, entrepreneurial team efficacy is related to corresponding business activities. However, team efficacy also includes the complex interplay of social interaction processes that are critical to success.

Building on psychological research, we identified Gibson and Earley's (2007) model of the "development and operation of group efficacy" in which relevant team processes are linked to team efficacy and subsequent team performance (Gibson and Earley 2007). To date, findings on team processes that influence successful team performance – particularly that of an entrepreneurial team – have been manifold, but mostly unstructured. One of the possible reasons for this could be different understandings of what successful team performance actually is (Klotz et al. 2014; Knight et al. 2020). In their model, Gibson and Earley (2007) assume that team performance is mediated by team efficacy. This assumption is based on findings from research about information processing, group development, and communication. According to the different phases of information processing within the team, different social interactions play a key role for successful performance. The first requirement to develop team efficacy according to Gibson and Earley (2007) is, for example, to accumulate information about the team's characteristics itself. Team members should know each other's abilities and self-efficacy beliefs. In addition, knowing the own affective response to a situation as well as the awareness of others' effect in the same situation is supposed to have a positive influence on the emergence of team efficacy. Moreover, another crucial step to increasing team efficacy is examining

accumulated information. This requires a team structure where regular interactions allow exchange of different perceptions and negotiation of different meanings. Role clarity and strong routines are suggested to offer such a frame for interaction and examination. Taken together, these antecedents that Gibson and Earley (2007) describe in their model of team efficacy represent a range of trainable teamwork components. Therefore, we suggest to include these team training components in existing project-based entrepreneurship education programs in order to have more successful entrepreneurial teams in the long term.

3 The Importance of Evidence-Based Entrepreneurial Team Training

To this purpose, we designed a concept of an awareness-raising entrepreneurship program at higher education institutions that includes the aforementioned components affecting team cognitions and team performance. Concerning course contents about basic entrepreneurial knowledge and skills, we have followed the suggestions of the aforementioned program by Frese et al. (2016), as well as contents proposed by the EU in the EntreComp framework. In addition to those entrepreneurship basics, we added one of team components that follow the structure of the model proposed by Gibson and Earley (2007), and which can be found in Table 1, to each of the 11 sessions of the course. As some elements require a more intense training and have an effect on different team efficacy antecedents, we used the element of repetition in learning and included them more than just once into a session. The first element to be trained is role clarity. In two sessions, we explain to participants the importance of exchanging information about the team member's strengths and abilities, as well as interpersonal team roles. The second element to be trained is the importance of routines and how to establish them. For example, meetings could be a way of creating routines in a team, which is why we included recent findings from meeting research. The third element to be trained is communication. As communication is a rather complex field to be trained, we have designed two sessions for this component. The sessions contain explanations about theoretical communication models, as well as exercises for efficient communication and active listening. We assume that training communication skills will help students to share information about themselves, but also about tasks and processes. In addition, we assume that a communication training would have a positive impact on the interaction and examination of different perspectives. The fourth element to be trained is self-efficacy. Until now, established entrepreneurship programs include this element rather as part of the methodology of the training, for example, through the involvement of role models, who share their entrepreneurial experience. In addition to the use of methodological aspects, we also want to enable students to increase their own self-efficacy through, for example, considering their personal resources when confronted with a challenging task or regular reflection of mastery experiences.

Table 1 Group efficacy development: example of entrepreneurial team training elements, based on the model of Gibson and Earley (2007)

Team-efficacy antecedents in the model				Team training component	Learning objectives	Examples in the literature	
Accumulation of information	Members	Member abilities	Identification of abilities and interests, role clarity	Students know the competencies of all team members	Pearce (1981) and Rizzo et al. (1970)		
			Self-efficacy	Students know and are able how to increase their own self-efficacy	Gist and Mitchell (1992)		
Group	Cohesion	Conflict management	Students know different types of conflicts and are able to use strategies (i.e., Harvard concept) on how to solve them	Ensley and Pearce (2001) and Tekleab et al. (2009)	Beal et al. (2003) and Lee et al. (2002)		
			Group norms	Students know important norms in their teams and respect them	Beauchamp et al. (2002), Mulvey and Ribbens (1999), Pearce (1981), and Sawyer (1992)		
Process	Cooperation/competition	Feedback	Students know the feedback rules and are able to use them in communication	Beauchamp et al. (2002), Chen and Bliese (2002), Rizzo et al. (1970), and Taggar and Seijts (2003)	Pearce (1981) and Rizzo et al. (1970)		
Task context	Task importance	Leadership	Students know tasks of a leader (moderation, delegation, controlling)	Beauchamp et al. (2002), Chen and Bliese (2002), Rizzo et al. (1970), and Taggar and Seijts (2003)	Becker (2004), Gersick and Hackman (1990), Lin et al. (2017), and Vough et al. (2017)		
Interaction and examination	Group structure	Roles	Role clarity	Students know the roles of team members and are able to assign tasks corresponding to their competencies	Becker (2004), Gersick and Hackman (1990), Lin et al. (2017), and Vough et al. (2017)		
		Routines	Establishing routines	Students know about the importance of routines and are able to develop them for the example of team meetings	Becker (2004), Gersick and Hackman (1990), Lin et al. (2017), and Vough et al. (2017)		

The fifth element to be trained is about giving and receiving feedback. It contains an introduction to established feedback rules and subsequent exercises. The sixth element to be trained is conflict management. Again, this element is trained in two separate sessions. They contain theoretical findings about effective conflict management, as well as practical exercises about managing and solving a conflict. The seventh element to be trained is leadership skills. From our understanding of current entrepreneurship programs, this aspect is mostly trained to enable individual entrepreneurs to effectively lead a team. However, in most teams there is only one who is going to lead so that we looked for skills that are more transversal in an entrepreneurial team. Therefore, we identified leadership skills, such as moderation, delegation, and controlling, as tasks that every team member should benefit from. The eighth and last element to be trained is about establishing norms and a team culture, based on joint values, goals, and beliefs. According to Gibson and Earley's (2007) model, subsequently, information will be accommodated and team performance will increase.

Given the COVID-19 pandemic, we used the opportunity to test out whether such a course format would work in a digital teaching approach as well and therefore designed an E-learning course. Twelve weekly sessions were designed, with the first one being solely focused on team formation, which involved teams of three members each being formed. Throughout the duration of the course these entrepreneurial teams are asked to develop their own business idea. Each session has five explanatory videos (10 minutes each) that contains basic entrepreneurial knowledge and skills (Bacigalupo et al. 2016; Frese et al. 2016). In addition to that, students have to reflect upon the acquired knowledge in an exercise including past success stories of entrepreneurs. To test students' knowledge, each session also contains a multiple-choice quiz. After passing these three theoretical course elements, student teams are supposed to work on different practical tasks each week. For these tasks, knowledge from the videos is required. For example, students are to implement a design thinking strategy to define a problem they want to address with their business idea. For this practical task, students are supposed to meet with their teams once a week. They write minutes about their work, which afterwards build the basis for weekly feedback in online live sessions. As a final task, students upload pitch videos and a business model canvas that are then supposed to be rated by experts.

The training was piloted in multiple countries, e.g., Pakistan, Jordan, Uganda, and Kenya, from 2020 to 2022, with more than 1200 students registering for the training. First iterations of the training resulted in high dropout rates over the course of the training, which resulted in multiple iterations of improving the program. These iterations included, for example, the involvement of local entrepreneurship experts who gave their input to improving the delivery of different topics thereby making them more culture-sensitive. Some individual factors related to institutions' semester timelines needed to be considered as well, in order to adapt the delivery of the format. After five iterations of the program in different countries, we reached a point of saturation, where student feedback as well as trainer's feedback was overwhelmingly positive.

4 The Way Forward to Training Entrepreneurial Teams: Challenges and Opportunities

Entrepreneurial team development seems to play a crucial role in starting a business. With this training, we tried to answer the call for more team-based training approaches in entrepreneurship (Erikson 2003) and developed an evidence-based entrepreneurial team training that we implemented in numerous countries across the world. Although we have not yet implemented the training in countries of the Global North, we are certain that our approach of piloting the training in multiple countries has resulted in a solid foundation for the training, so that an implementation in the Global North should provide a similar quality of results. However, the implementation of such programs brings a number of challenges, which is why it is necessary to talk about these challenges as well as recommendations for the future.

As with all teaching and trainings, the most important factor is to keep the commitment of participants high. Starting a business is characterized by failure and a lot of ideation loops so that the practical experience in a team-based entrepreneurship course should echo that as well. One way of increasing the commitment of students to the course and its objectives can be through additional support from mentors. Direct contact persons, who can react to team-specific issues, could increase the long-term commitment. We are aware of the increased human resources this would involve; however, this risk could be mitigated by involving student ambassadorsassistants with a sound understanding of entrepreneurship, thereby limiting resources needed. Ideally, course facilitators should not focus on transferring knowledge and explanations of tools only but rather focus on providing specific feedback and motivation for the students to have a full-fledged entrepreneurial experience. Furthermore, including peer feedback and network events between the different participating teams are recommend as students might benefit from each other's errors and mutual support related to the teamwork mode.

An additional challenge is the team formation process. We realized that promoting an extracurricular entrepreneurship course where students develop their own business ideas mostly attracts students who already have an idea in mind. Apart from creating conflicts between team members about which idea should be further developed and participants dropping out if their idea was not selected, the course would not do justice to its aim of raising awareness and increasing entrepreneurial intentions for those who have not had a business idea yet. Therefore, ideas need to be developed on how to promote a team-based entrepreneurship course that also attracts students with non-attitudes or lower intentions of starting a business. One of the possibilities to tackle this could be open sessions at the beginning that could be used as platform for the teams to be formed as well as interest raised with students who will not commit to something longer. Incidentally, in one of the piloting countries, i.e., Jordan, the government made a bold decision to create mandatory awareness-raising entrepreneurship education formats, which dramatically assists in reaching the aforementioned groups as well.

A major challenge in the piloting of the entrepreneurial team training was the digital format. Given the COVID-19 pandemic, we felt that there were “ideal” environmental conditions for E-learning approaches to flourish, as there was no educational alternative being offered apart from digital education. Some aspects, such as knowledge about the importance of teams or teaching theoretical concepts, can easily be taught in an online format. Yet working only in virtual teams is still a major challenge. For example, the execution of team tasks was severely impacted by the physical distance and virtual meetings of teams did not provide enough room for “watercooler” talk that would otherwise have helped with the development of team identity. To a certain extent, these disadvantages can be compensated (e.g., having live virtual sessions as an integral part instead of static E-learning material only). But when it comes to training of interpersonal competences, we certainly recommend developing a face-to-face format equivalent to this course, as many of the team facets are likely to come out stronger in a face-to-face format. Thus, depending on the purpose of the team training, teaching knowledge or training interpersonal competences should impact the choice for the appropriate course format. We have already started to implement a hybrid format, hoping to leverage the best of both worlds.

Finally, we designed the training with a research platform in our mind. From the outset, we rigorously designed a training that could be scrutinized using state-of-the-art empirical research methods. Therefore, we believe that the benefits of such an entrepreneurial team training approach should ideally be understood using an experimental study design. For example, indicators of a successful completion of the course could be seen in the area of entrepreneurial intention, entrepreneurial team performance, or specific entrepreneurial behavior that is displayed after the course. Obviously, it makes sense to understand these outcome variables not only immediately after the training has been completed but also in a longitudinal approach. To this purpose, the training presented here could be compared with a training that does not include the team elements described above. This could be easily achieved by focusing on the more traditional entrepreneurship contents and leaving out team contents. Ideally, such a study design would show the benefits of the team-based training approach.

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