Future Skills – The Key to Changing Higher Education

#lead-in

Future Skills has contributed to a decisive change of the public discussion about higher education, which we refer to as the *Future Skills Turn*. To examine this *turn* and its implications for the future of higher education is the purpose of this book. As a concept, *Future Skills* has gained an importance similar to that which emerged in the seventies of the last century from ideas such as *equal opportunities* or *science orientation* in European education. Such guiding principles usually do not appear as precisely tailored and empirically operationalized concepts, but rather as conceptual condensations of broadly diversified bundles of arguments and objectives – equally in the public, the political and the scientific discourse.

The starting point for the enormous career of the *Future Skills* concept is the insight that current concepts of higher education do not meet the urgent needs of our societies with convincing future concepts. Neither they are fit to help sustain our environment nor associated social or economic challenges. While social challenges are exacerbated by an accelerating process of globalization and digital advancement, at the same time these are the very forces that enable a multitude of new options for human development. In this situation of digital acceleration, the characteristic feature is that of uncertainty and the inevitable necessity is that of creative responsibility. It is a platitude that the future is unpredictable, however we must be prepared to shape it.

In ten to twelve years' time, children who attend primary school next year will be entering vocational training or higher education, and in fifteen years' time they will be the new professionals who as young citizens take over the responsibility in our society. We know little about this future. In the year 2060-2065 they are likely to retire, end their employment and/ or cease working. About this future we do not know anything. Our schools must prepare them for jobs that do not yet exist, for technologies and applications that have not yet been invented, for living in a society

whose social structures we cannot foresee today, and for dealing with challenges that are not yet discernible. It is our shared responsibility to make the most of the opportunities and find ways to deal with this uncertain future. It is about nothing more and nothing less than the preservation of our planet and our livelihoods.

Solving social problems, such as those associated with climate change, the challenges of migration, which will continue to increase in the future, the conflicts arising from populist social and political drafts and the associated question of the future of our democracies – all this requires the ability to develop new and so far unknown approaches, to tread new paths and to relate the hitherto unconnected to one another in a new way. In education and science, this will only succeed if we work inter- and transdisciplinarily in the best sense of the word, to compile solutions and contributions of each of the disciplines and sciences, to reflect critically on them and to relate them to one another. This, however, is a big challenge. Higher education Institutions are struggling with it because they all share a common handicap: The history of science, research and thus also of higher education is a history of "silo-ism", specialisation and differentiation of disciplines – the almost 18,000 degree programmes offered at German higher education institutions alone are proof of this. The old institution of higher education is faced with the challenge of having to reinvent itself – in a time when academic education is experiencing an enormous growth process and is projected to reach 70 percent plus of an age cohort worldwide by 2050. It's like having to replace the pilot in a car race, right in the middle of a steep turn and during a risky overtaking manoeuvre.

#futureskills

The research project *NextSkills* aims at finding models and descriptions for future relevant skills, so-called *Future Skills*, within the framework of a multi-methodological research design and through international consultations.[1] *Future Skills* should be the skills that enable university graduates to master the challenges of the future in the best possible way. The results show that to deal with future challenges, students must develop curiosity, imagination, vision, resilience and self-confidence, as well as the ability to act in a self-organised way. They must be able to understand and respect the ideas, perspectives and values of others, and they must be able to

1 More and up to date information about the *NextSkills* project can be found here: http://www.NextSkills.org

deal with mistakes and regressions, while at the same time progressing with care, even against difficulties.

In numerous conversations, interviews and analyses, it became clear to us *that Future Skills* must also strive to raise awareness for local and global challenges; to raise awareness and become mindful of how climate change impacts on nature and the environment – and to focus with greatest attention on how students can acquire skills to participate in societal contexts in order reduce or reverse these impacts. It is also about shaping social issues such as demographic- or migration challenges.

Promoting *Future Skills* also means to strive for creating an educational system that enables future citizens to deal with the challenges involved and to care for greater coherence in society, to value openness, tolerance and an awareness of differences and diversity, and not to succumb to populist explanations. It became clear to us that the question of how young people can be empowered to participate in social systems and processes, and how we can strengthen justice, peace and the integrity of creation and community as values in a future society, will determine the relevance of our higher education Institutions in the future.

At the same time, today's specialist and expert knowledge will only represent a small part of what future generations will be able to draw on in their search for solutions to complex problems. Next generations will be driven by more than career prospects, a good job and a high income. They will also strive for the well-being of their friends and families, their communities and the planet as a whole. Empathy, mindfulness and passion will become explicit educational objectives of the higher education institutions of the future. It will be about realising educational concepts that equip learners with strength, energy and conviction and with the ability to communicate them in an appreciative and effective way. The skills they need must enable them to shape their own lives and contribute to the well-being of others.

Higher education institutions would do well to turn away from the goal of imparting knowledge that is primarily concerned with self-contained and easily verifiable relations for which there are right and wrong answers. In the future it will be important to study on the basis of questions for which there are no immediate correct answers, but in which it is a matter of weighing, plausibly arguing and representing value attitudes and orientations. The *NextSkills* project was launched to find out what these skills are and how they can best be developed. The aim of this project is to provide universities, their management and their teachers with answers on the direction in which educational goals, structures and processes need to be shaped. The focus is on three questions:

1. What skills will people need in the future to shape their world and environment as citizens in an increasing globalised context? What skills do employees need

in order to cope with the constant development and constant adaptation to new situations in organisations and working life? We call these skills *Future Skills*.
2. How can organisations help their staff to acquire these skills and what organisational forms and structures are needed to develop the optimal organisational cultures for this?
3. What can higher education institutions do to promote these skills among students? How should studies and teaching be structured, and which forms of higher education didactics and learning designs are suitable?

In this book we describe the results of this work. The concepts presented are backed up by in-depth interviews, expert assessments and international Delphi Studies.

If *Future Skills* are placed at the centre of considerations for higher education, then the need to rethink higher education as a place of research, teaching and learning becomes apparent at many points. And the following applies: Everything that is easy to teach and easy to assess is also easy to digitise – and thus also to automate. *Future Skills* such as creativity, self-organisation-abilities, self- and reflection competence or Design Thinking Competence, however, require ingenious forms of learning, teaching and development. It is therefore a question of how the promotion of *Future Skills* can be anchored in higher education curricula. This involves concentrating on active, creative forms of teaching and learning and educational objectives that require complex assessment scenarios, and that go beyond the mere transfer of knowledge and focuses on the development of specific competences.[2]

#stateofplay

The *NextSkills* studies does not take place in a vacuum. The question which skills should form the basis of learning concepts is highly relevant in any higher education system for current and future generations – and one that has already been discussed in many different ways and places. After research on graduate attributes was in the foreground in the eighties and nineties of the last century, there is currently a veritable renaissance of scientific work on this topic. These are, firstly, labour

2 The terms competence, skill as well as agency need a careful consideration since they are the conceptual core of the *Future Skills* concept. We have therefore devoted several entire sections to describe, define and deliminate the concept of competence which we understand as ability to act in unknown complex contexts, an understanding which is based on works of Erpenbeck (e.g. Erpenbeck 2012). See chapter A2 (and following) for a comprehensive elaboration.

market studies that raise the question of what the future of increasingly digitised workplaces will look like. Secondly, these are studies of societal scope which pose the question what society will look like in 2030 or 2050. These are questions like: Will work continue to be the sense giving element in our common lives? What are the risks that individuals in a society have to cope with and what are the best strategies to cope with them? Here, too, the digital penetration of the entire private sphere plays a major role. And thirdly, the question which educational concepts are suited best to prepare students for unpredictable futures. And finally, there are numerous approaches emerging in the field of international organisations starting with the famous report by Jacques Delors in 1996 to the European Union (EU) stressing "living together" as a central educational objective, the Organisation for Economic Co-operation and Development (OECD) or the United Nations Educational, Scientific and Cultural Organisation (UNESCO), all raising the question how societies can learn and live together in such a way that global challenges can be adequately and effectively addressed. All these different perspectives, which have been increasingly discussed since the 1990s, are moving into focus through international cooperation, global networking and digitisation. The discussions are reflected in concepts such as the seventeen Sustainable Development Goals (SDG) and further international, cross-border education and society future scenarios.

The question which skills young people of generations to come will need to cope with the challenges described above is therefore a highly topical one. It is much discussed and is currently one of the hot topics, not only in educational science, but also in economics, organisation- and labour market studies. Most of the approaches are empirically analytical and attempt to predict the future by analysing existing developments, projecting them into the future, for example by taking the development of new occupations and occupational fields as a basis or by (linearly) updating the speed of technology development and its application to automation in work processes, thus creating new professional profiles. From these, requirements are derived, which are then developed into competence profiles in schools and universities. This approach has limits that are now becoming increasingly foreseeable.

#emergence

It is clear that the debate on the future capabilities needed to meet the societal challenges of present and future generations must take into account one thing in particular: An ever faster and non-linearly changing context of action. This characteristic is finding its way into more and more educational concepts – initially

on a purely descriptive level. The question is how higher education can deal with situations in which the very nature of knowledge is changing, and knowledge is becoming one amongst many different ingredients of meaningful higher education – and not the most important one. When unpredictability and uncertainty in future professional and private contexts become the rule of the day. Future-ready students need to exercise agency, in their own education and throughout life. Agency implies a sense of responsibility to participate in the world and, in so doing, to influence people, events and circumstances for the better. Agency requires the ability to frame a guiding purpose and identify actions to achieve a goal. Recently, more systematic and scientific-theoretical concepts have been elaborated, in which the question of unpredictability is put into the centre. At present, these include drafts from ecosystem theory, physics in the field of research on emergent systems and self-organisation, and cybernetics in behavioural research and biology. They are based on the realization that developments in systems often lead to new states that cannot be derived from the previous states. The so-called emergent development has the distinct characteristics: irreducibility, i.e. the impossibility of linearly extrapolating a development into a future development, since the future development, as a new status, can no longer be reduced to the previous one; secondly the characteristic of unpredictability, i.e. the impossibility of predicting the next, subsequent state. Applied to social, political and economic processes, as well as communication processes, this means that individuals will have to deal with situations in the future that can neither be predicted nor calculated in advance.

More and more a sense of urgency within the higher education governance community is developing. The question is clear: how to deal with the unforeseen? Contributions to *Future Skills* must provide answers to this question. At present, there are only a few competing approaches that really address this question systematically and go beyond the pure and already known concept of competence. With this book we aim to close this gap. In the present work a model for *Future Skills* is designed. It combines theoretical aspects of education with competence concepts and concepts of self-organisation.

#triplehelix

This is a book about the future. Our current university education concepts are still strongly oriented towards knowledge transfer. Building up and accumulating knowledge in order to then call it up in future professional action contexts is – to put it pointedly – the current game of higher education, studies and the labour market.

However, it seems that we have reached the limits of this way of working. Our study shows that especially in those fields of work that can be regarded both as highly agile and at the same time knowledge-intensive, simple retrievable knowledge is less and less the currency of future labour market success, but *Future Skills* are. In the context of the *NextSkills* Studies, the *Triple Helix-Model* of the capacity to act[3] in emergent contexts will be developed and presented in Chapter A 1 Objektives & Methodology of the *NextSkills* Studies.

We see the higher education system worldwide in the midst of a transformation process. In structural terms, all industrialized societies are on the verge of becoming a "Bildungsgesellschaft" (an *educational society)* in which the pressure on individuals to obtain academic education is constantly increasing. This goes hand in hand with an ever-stronger networking demand due to the availability of communication media and the rising competition in globally available information and knowledge. The resulting acceleration of the development and decreasing half-life of knowledge resources necessitates a constant lifelong updating of the knowledge of the individual. However, knowledge is not enough, it merely forms a basis for *Future Skills*. While not all skills are new, the extent to which performance in *future organisations* depends on them gives them a completely new relevance.

Future Skills is a dazzling term that is based on a variety of understandings. The existing approaches are often exhausted in bare listings of future-laden concepts and terms that carry importance for *Future Skills.* List follows list. Beyond this fresh but purely additive view, there are currently only the older and already familiar but barely really implemented *competence-oriented* learning scenarios. It is often emphasised that educational science has always been concerned with *Future Skills*. After all, what, if not *future* capacity to act should educational concepts actually contain? Admittedly, *Future Skills* is therefore a dazzling and (today) popular term which, from an educational science point of view, certainly already contains construction challenges.

If these challenges are left aside, it also offers opportunities. It stands out from the already somewhat entrenched debate about the introduction of competences as constructs of knowledge, skills and attitudes, does not at first glance immediately refer to the discussion about key qualifications and competences and is internationally connectable. The term is therefore attractive but requires a good deal of conceptual sharpening and delimitation.

---

3 English "Agency": "Future-ready students need to exercise agency, in their own education and throughout life. Agency implies a sense of responsibility to participate in the world and, in so doing, to influence people, events and circumstances for the better. Agency requires the ability to frame a guiding purpose and identify actions to achieve a goal."

#agenda

With this book we pursue two main objectives: On the one hand, we want to report in detail on the results of the three-year *NextSkills* project and its content for German and English research on *Future Skills*. On the other hand, our aim is to use the book to establish a theoretical frame of reference for *Future Skills* in higher education and to classify existing research related to the topic within it. The following infographics (Figure 1) illustrate the structure of the book conceived for this purpose.

The book is divided into three large parts, preceded by a foundational chapter on the *Future Skills* Turn (Chapter II. The Future Skills Turn). The *Future Skills* Turn is described by means of various real-life organisational examples, which show the increasing importance of *Future Skills* as a future guiding orientation for higher education. In this chapter it becomes clear that *Future Skills* is not so much about a new concept of education or competence, but about the description of those competence profiles that gain importance as *Future Skills* under the conditions of highly emergent contexts in advanced future organisations.

Part A is then dedicated to the very nature, definition and elaboration of *Future Skills*. Chapter A 1 Objectives & Methodology of the NextSkills Studies first describes the study design of the *NextSkills* Studies. Chapter A 2 The *Future Skills Triple Helix-Model* develops a basic theoretical framework for *Future Skills* as an educational concept. The so-called *Triple Helix-Model* of capacity to act in highly emergent contexts is developed. The model is based on the recognition of three shifts taking place, three major changes in the basic structure of the world of work, to which the *Future Skill* concept responds. Within the research on *Future Skills* and the *Triple Helix-Model* for *Future Skills*, the *NextSkills* project offers as the first study ever a theoretical frame of reference for *Future Skills*. In Chapter A 3 *Future Skills* for the World of Tomorrow, the seventeen *Future Skills* Profiles are worked out, defined and described. Chapter analyses the results of the international *NextSkills* Delphi Study in terms of the maturity of current higher education and its ability to support the development of *Future Skills* among students.

Part B of the book is dedicated to the task of reviewing the state of the art in *Future Skills* research. There are currently no comprehensive literature reviews on this subject in either German-speaking or English-speaking countries. Chapter B 1 State of Research – Old Bottle, New Wine? presents the state of research, starting with related research on graduate attributes. Chapter B 2 Foundations of the *Future Skills* Revolution: The Theory of *Future Skills* constructs and describes the essential theoretical frame of reference for *Future Skills* research. The so-called "drift to self-organisation" plays a decisive role connecting different theoretical contributions.

Part C of the book is devoted to the question of what the university of the future will look like. First, Chapter C 1 Ten Seconds of the Future of Higher Education describes ten main drivers of the future of universities. Chapter C 2 Rethinking Learning, Teaching and Research: An Agenda for Higher Education of the Future then describes how higher education Institutions will develop on the basis of these drivers from both a pedagogical and an organisational perspective. Chapter C 3 Four Scenarios for the University of the Future concludes by formulating four possible scenarios for the university of the future.

In the glossary, the book develops an important system of cross-references for the partially terminologically complex work. A comprehensive bibliography of German and English literature on the subject is also documented.

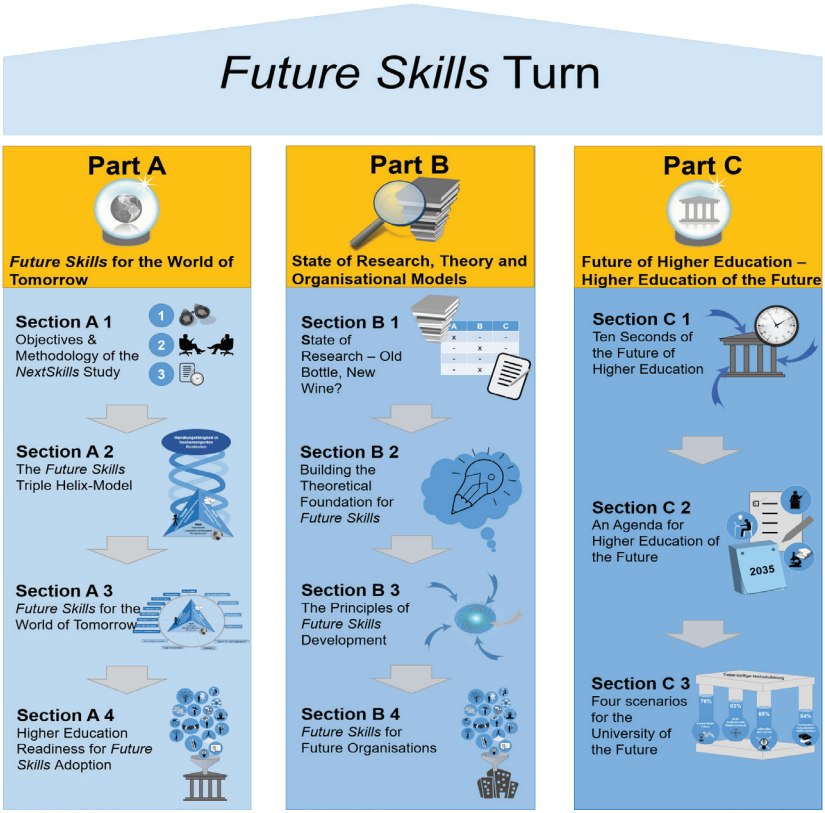

Fig. 1 Agenda – the bigger picture