



Albert-Ludwig-University Freiburg
Faculty of Environment and Natural Resources

Learning to learn: Action-oriented research approach to incorporating learning processes in the municipal administration DATEN:RAUM:FREIBURG project

Master-thesis submitted in partial fulfillment of the requirements for the degree of Master of
Science Environmental Governance

by

You Rui Yeo

Matriculation number: 5161428



First supervisor: Dr. Philipp Späth, University of Freiburg
Second supervisor: Dr. Niko Schäpke, University of Freiburg

Freiburg i.Br. / Germany

Date of submission:
25 Nov 2022

Table of Contents

Acknowledgment.....	4
Overview of tables and figures.....	5
Abstract.....	7
Section 1 - Introduction and Background.....	8
Social relevance: The need for learning and reflection in municipal administrations towards new governance approaches.....	8
Research gaps: Practical-knowledge gap, population gap, and empirical gap.....	11
Research strategy: Action-oriented case-study exploratory research.....	12
Research objectives and research questions.....	13
Potential contributions this study can have for research.....	15
Outline of the thesis.....	15
Section 2 - Literature Review and Analytical Framework.....	16
Introduction to the literature review section: Goals, process, structure.....	16
Conceptualization of learning and reflection for organizational change.....	16
Project teams as generative learning spaces for organizational learning.....	21
Experiential learning as enabler for project-based learning.....	24
Social reflection and shared meaning-making as facilitator between individual, team and organizational learning.....	27
Analytical framework: Group reflection sessions as a social reflective practice for organizational change through project-based learning.....	32
Reflections on the literature review and analytical framework.....	36
Section 3 - Methodology.....	37
Introduction to the methodology section: Goals, process, structure.....	37
Research strategy: Incorporating elements of transdisciplinary and action-oriented research approach.....	37
Case study: DATEN:RAUM:FREIBURG project.....	38
Positionality: My role in and relation to the project team.....	47
Overall design.....	48
Data collection.....	53
Data analysis.....	54
Reflections on the methodology.....	55
Section 4 - Findings and Discussion.....	56
Introduction to the findings and discussion section: Goals, process, structure.....	56
Update on the analytical framework.....	56
Plan: Understanding the context and problem definition.....	58
Participants' conceptualizations of learning within the project, perceived challenges, and enabling factors.....	58
What can be learned from the Plan phase?.....	72
Methodological observation, reflection and lessons.....	73
Act: Group reflection session as intervention.....	74
Challenges in the design and implementation of a group reflection process within the prototypical phase.....	75
What can be learned from the Act phase?.....	78
Methodological observation, reflection and lessons.....	79
Observe: Role of group reflection session in learning process.....	80
What can be learned from the Observe phase?.....	89
Methodological observation, reflection and lessons learned.....	91
Section 5 - Reflect: Overall Discussion.....	92
Putting it all together: How do the findings relate to the research questions?.....	92

Summary of key findings: How this study addresses the research objectives.....	94
Potential role of learning through prototyping as a project approach in enabling organizational transformation in the municipal administrations.....	94
Challenges to learning from project-based prototyping approaches.....	95
Reflective learning: Learning to reflect on learning for improved learning.....	99
Limitations and future research avenues.....	101
Section 6 - Conclusion.....	104
Implications for practice.....	104
Implications for research.....	106
In a nutshell.....	107
Post-Script: Self-Critical Reflections - The Quality of this Research Process and the Thesis as an Outcome.....	108
References.....	111
Appendices.....	125
Appendix A: Further Information for Section 2 - Literature Review and Analytical Framework.....	125
Appendix B: Further Information for Section 3 - Methodology.....	128
Appendix C: Relevant Raw Data.....	135
Appendix D: Complementary Information for Data Analysis.....	156
Testimony.....	164

Acknowledgment

Although I was told that writing a master's thesis is challenging, and was warned that taking an action-oriented research approach would be demanding, I was not expecting to go through a Hero's Journey¹ and go through the depths of despair that I sometimes encountered along the way (melodramatic as I am). But as I come towards the end of the journey (at least with regards to the thesis), I would like to thank everyone and every non-living, non-entity that made it possible for me to survive this ordeal.

I give my sincerest thanks especially to the following people (in no particular order), without whom this thesis may not have materialized or at the least, the journey would have been unbearable.

To Philipp – I am not sure that you knew what you were getting into when you agreed to be my first supervisor (clearly *I* did not know what I was getting into), but I thank you for your (seemingly) boundless patience, time, supportive encouragement, and helpful feedback, all of which I deeply appreciate and greatly admire.

To Niko – thank you for your thoughtful reply on my idea of pursuing an action-oriented approach, without which I may not have taken the step to try it out. Thank you especially for your time in providing support and constructive feedback, despite the academic structure not officially recognizing your effort as a second supervisor.

To Nils – behind every desperate and relapsing perfectionist is a long-suffering partner. Thank you for staying with me and supporting me even when I broke promises, literally left you out in the cold, bore you with all the thesis talk (with friends and at all other times), and made you read and review incomprehensible drafts.

To Ramshid – sometimes when struggling through self-created difficulties, we find solace with other co-sufferers. Thank you for listening to my rants, sharing your struggles, giving me the permission to quit MEG, for laughing at ourselves, and for offering to help me get past my brick walls even when facing your own.

To MEGpie Early Fliers and Hanna Healander – thank you for the regular accountability sessions and group therapy.

To Pachu – thank you for your “thesis therapy“ through messages and in sessions late into the night.

To Inge – thank you for spending your hard-earned post-retirement time to send me encouraging thoughts and agreeing to read incomprehensible drafts.

To my friends, my families, and everyone who I have neglected during this time, I am sorry and thank you for your patience.

To I.A., C.B., R.H., D.K., K.K. – thank you for your engagement with the research project and for your input, moderation, proofreading, etc. besides taking part in the study. And to M.B., M.H., G.S. P.K., D.T. - thank you for going on this *Entdeckungsreise* with me and for experimenting with me.

In addition, I am grateful for the generosity of the following individuals who took time out of their schedule to help a stranger (me) with my thesis and/or provide support in other ways - Prof. Dr. Ulli Vilsmaier, Tom Maxwell, Sophia Silverton.

I am grateful as well to the people behind the freely-available technologies that supported this process: Zotero, Joplin, LibreOffice, Deepl.com, Linguee.de, oTranscribe.com, QDA Miner, BigBlueButton, Conceptboard, Jason Lewis from Mind Amend, and the list goes on...

As I take stock at the end of this painful journey, the non-living, non-entity that I am most grateful for is the thesis process itself. Although I have cursed you at many points of the journey and questioned the point of your existence, I have (mostly) never lost sight of the immense learning and growth that I have achieved through you (and through the creation of your counterpart, my Anti-Thesis).

1 Referring to this idea of the Hero's Journey: https://en.wikipedia.org/wiki/Hero%27s_journey

Overview of tables and figures

List of Tables

Table 1: Overview of Research Motivation, Research Objectives and Research Questions.....	14
Table 2: Potential Contributions to Research.....	15
Table 3: Organizational Learning and Organizational Knowledge Perspectives.....	17
Table 4: Levels of Learning.....	19
Table 5: Descriptions of Raelin's Social Reflective Skills.....	31
Table 6: Conceptual Understanding and Relations between Concepts.....	33
Table 7: Analytical Framework with Supporting Research Questions.....	35
Table 8: Requirements for Action Research and Attempts to Address Them.....	37
Table 9: Project Structure: Work Streams and Departments of Project Members.....	41
Table 10: Types of Knowledge Learned as Reported by Participants.....	46
Table 11: Final Research Process.....	51
Table 12: Elements of Group Reflection Sessions for the Intervention Conducted in this Study....	52
Table 13: Research Participant List.....	53
Table 14: Data Collection.....	54
Table 15: Updated Analytical Framework.....	57
Table 16: Participants' Learning Goals and Expectations.....	62
Table 17: Learning Mechanisms as Perceived by Participants and Corresponding Concept.....	64
Table 18: Categorization of Concepts by Theory or Field.....	65
Table 19: Important Factors for Project-based Learning.....	69
Table 20: Important Factors for Learning Through Prototyping.....	70
Table 21: Challenges that Arose from the Design Process of the Group Reflection Session.....	76
Table 22: Joint Meaning-Making as Outcomes of Group Reflection Sessions.....	81
Table 23: Example Outcome of Group Reflection Session categorized by Mezirow's Object of Reflection.....	82
Table 24: Synthesis of Findings from the Phases in Relation to the Central Research Questions....	92
Table 25: Self-Assessment of the Incorporation of Action Research Requirements per Zuber-Skerritt & Fletcher (2007).....	108
Table 26: A Summary of the Organizational Learning Concept and Practices from Wang and Ahmed (2003, p. 10).....	125
Table 27: Definitions of Organizational Learning from My Literature Search.....	126
Table 28: List of Departments Involved in the Project in German and English.....	128
Table 29: Original Research Plan in the Research Proposal.....	129
Table 30: Participant List with Attendance.....	134
Table 31: Original quotes in German and Data Source for Learning Goals and Expectations.....	156
Table 32: Original quotes in German and Data Source for Learning Mechanisms.....	157
Table 33: Original quotes in German and Data Source for Important Factors for Project-based Learning.....	158
Table 34: Original quotes in German for Important Factors for Learning Through Prototyping....	159

List of Figures

Figure 1: Organizational Learning as a Dynamic Process.....	21
Figure 2: Structural Dimensions Underlying the Process of Experiential Learning and the Resulting Basic Knowledge Forms.....	25
Figure 3: The interrelationship of individual and collaborative reflection.....	28
Figure 4: Reflective practice enabling 4I learning processes.....	28
Figure 5: Overview of Dialectic Dimensions of Conversation as Experiential Learning (Baker et al., 2005, pp. 414-425).....	31
Figure 6: Relationships between Core and Action Research Projects.....	48
Figure 7: Relation between My Research and the Project's Phases as per Action Research Cycle...	49
Figure 8: Iterative Action Research Cycles.....	50
Figure 9: Research Project Schedule as Communicated to Participants at First Workshop.....	129
Figure 10: Documentation of Design Decision for Reflection Sessions in Confluence.....	130
Figure 11: Input for August 15 Workshop Regarding Dialogue.....	133
Figure 12: Selected Survey Responses for the May 23 Workshop.....	138
Figure 13: Selected Workshop Documentation from the May 23 Workshop.....	139
Figure 14: Selected Survey Responses from June 27 Workshop.....	140
Figure 15: Selected Survey Responses for the August 29 Workshop.....	150
Figure 16: Selected Documentation in Conceptboard from the August 29 Workshop.....	155

Abstract

With the increasing rate of urbanization, municipal administrations face complex socio-ecological challenges. New approaches to governance are necessary in order to face these complex challenges. In line with that, there is a movement within the public sector to learn to become more flexible. Yet, many municipal administrations face difficulties engaging in organizational learning, particularly in pursuit of organizational transformation towards new and adaptive modes of governance. Consequently, some municipal administrations have started engaging with prototyping or the agile methodology, particularly in their digitalization projects, reflecting the influence from the technology industry. However, research in this context is lacking. Research in organizational learning has shown that project-based learning can be an important mediator between individual learning and organizational learning towards strategic renewal, but does not show the role of learning through prototyping as an approach to learn new ways of working. On the other hand, experiential learning theory clarifies the process of learning-by-doing, but does not adequately address its relation to team and organizational learning. Using an action-oriented research strategy, this study aimed to explore the learning process of a project team that is engaged in learning through prototyping within a municipal administration. By studying a group that is having this explicit focus on the learning-by-doing approach, it contributed to the understanding of its potential for enabling organizational learning towards transformation. In addition, this study sought to contribute to practice by exploring the challenges in such learning approaches and the possibilities to improve this learning process. Findings suggest that the project still lacked an explicit focus on learning, despite the acknowledgment of the importance of learning by selecting a learning-based approach. This lack of focus led to challenges such as a lack of conceptual clarity of learning and a lack of ownership of the process. Without this focus on learning, it was difficult to navigate the inherent tensions of the learning process. This suggests that reflective learning (*reflection on learning for learning*) would be necessary to improve the learning processes of project teams engaging in such approaches. For example, by asking the “who, what, when, where, how” questions of learning and by tracking learning as explicit project goals. This is especially important in order for project-based learning within municipal administrations to be able to contribute to organizational learning, specifically, the kind that would be necessary to transform their governance approach into one more suitable to tackle the challenges of the New Urban Age.

Section 1 - Introduction and Background

Social relevance: The need for learning and reflection in municipal administrations towards new governance approaches

In order for municipal administrations to operate effectively in an environment of change, uncertainty, and ambiguity, they need the ability to learn alternative approaches to governance, where continuous learning and reflection plays an important part.

Municipal administrations are important actors in the global sustainability transition

“Our struggle for global sustainability will be won or lost in cities.” declared Ban-Ki-Moon, Secretary-General of the United Nations in 2012 (UN Press, 2012)². This illustrates the growing recognition of the importance of the urban sustainability transition in working towards global sustainability. Urbanization is expected to continue at a rapid pace, leading to some labelling this as The New Urban Age (United Nations, 2017). Despite only occupying 2% of total land today, urban areas produce 70% of global GDP as well as 70% greenhouse gas emissions, highlighting their role as key sites for transformation if we are to transition successfully into a more sustainable future (United Nations, 2017). Many actors have an influence in urban sustainability transitions, such as the different levels of national, state and local governments, as well as actors from the private sector and civic society. However, The New Urban Agenda adopted at the United Nations Conference on Housing and Sustainable Urban Development (Habitat III) in Ecuador in 2016 also highlighted the major role that city or municipal government or administration (hereafter referred to as municipal administrations) plays in this process (United Nations, 2017). These administrations can play different roles in either supporting or hindering the transition to a more sustainable future (Kronsell & Mukhtar-Landgren, 2018).

Complexity of social-ecological problems requires new forms of governance

However, the social-ecological problems facing municipal administrations are increasingly complex, persistent and interdependent, the so-called “wicked problems”. No clear solutions exist, and current urban governance approaches by municipal administrations are seen as ill-equipped to handle the uncertainty and ambiguity inherent in these challenges (Castán Broto, 2017; da Cruz et al., 2019; Hendriks, 2014). Various alternative approaches to governance have been proposed in the sustainability literature, approaches that are supposedly meant to be more effective in tackling these challenges (see, e.g., adaptive governance; Chaffin et al., 2014; experimental governance; Eneqvist & Karvonen, 2021; complexity-based governance; Ansell & Geyer, 2016; reflexive governance; Simrnons et al., 2018). Although these approaches have different claims on how governance should look like, what they have in common is the implied need to learn to do things differently than before. In particular, the field of new urban governance is increasingly active (da Cruz et al., 2019). Although (urban) governance is a concept with various definitions, my meaning here broadly aligns with Hendrik’s (2014) definition, “urban—governance refers to the more or less institutionalized working arrangements that shape productive and corrective capacities in dealing with—urban—steering issues

involving multiple governmental and nongovernmental actors” (p. 555). As argued by da Cruz et al., urban governance is an appealing concept as it allows for the focus beyond the city hall towards the relationships and interactions between various actors, as well as the conditions and rules that frame those relationships and interactions. This is necessary, as municipal administrations “do not exist in vacuum” (da Cruz et al., 2019, p.1). I thus refer to a municipal administration’s governance approach as the way in which the organization’s relationships and interactions between various actors are viewed within and shaped by the organization, as well as the understanding (and potential manipulation) of the conditions and rules that frame those relationships and interactions. This understanding thus encompasses the practices and actions of the municipal administration in urban governance, as well as the underlying normative understanding within the organization of the administration’s role. The former refers to the way they do things, specifically their behaviours in the institutionalized working arrangements, whereas the latter refers to how the organization ought to approach governance and what ought to be their role in relation to other actors. By forms or modes of governances, I refer broadly to the different prescriptive ideas on how these institutionalized working arrangements should be organized (see, e.g., the concept of modes of governance in Bäckstrand et al., 2010). These modes suggest what roles municipal administrations are supposed to play in urban governance and what practices they need to engage in or capacities they need to build, in order to be able to contribute to sustainability transitions. Although this research does not explore which modes of governance are appropriate, I assume that municipal administrations have some level of agency in shaping their governance approaches (re-aligning the mode of governance they should strive for) and that the current ones are inadequate in addressing the current socio-ecological challenges in the urban context.

Learning and reflection as a key enablers for adopting alternative urban governance approaches

Learning and reflection can play different roles in enabling municipal administrations to engage in alternative approaches of governance (van den Dool & Schaap, 2020). Beyond the necessity of learning these new approaches to governance, there also needs to be the capacity to manage difficult organizational change, given that municipal administrations are often seen as being slow, bureaucratic, and resistant to change (Gilson et al., 2009). Municipal administrations must learn how to become more adaptable, in order to become better at managing change (da Cruz et al., 2019; Simrnons et al., 2018). In fact, Schein (1995) argues that organizational change management is essentially “managed learning” (based on Kurt Lewin’s Change Theory, as cited in Schein, 1995). Furthermore, learning and reflection play a central role in some of the new governance models (see, e.g., Transition Management Cycle by Loorbach, 2010). Given that the problems are too complex to be solved by existing knowledge, learning to learn and learning to be reflexive in problem-solving are crucial. Thus, learning plays different and interrelated roles in enabling municipal administrations to better address the challenges they face. First, learning how to become more flexible as an organization (managed learning to *enable* organizational change). Second, learning as a means to *acquire the skills and knowledge* required in the new approaches of governance. Third, learning and reflection as *embedded* part of the new approaches to governance themselves (Loorbach, 2010). On the other hand, reflection can relate to learning in two ways. First, as an enabler of learning (learning through reflection). Second, as a skill that needs to be learned (reflective capacity). This research does not aim to provide a comprehensive view of the relations between learning and reflection, however, these concepts will be explored in more detail in the literature review, focusing on the aspects relevant for this study.

Learning-by-doing or doing without learning?

Given the importance of learning (and the capacity to learn) in governance, many municipal administrations are beginning to employ new approaches to working, based on new governance approaches, *while* learning how to do so (learning-by-doing). For example, through urban experiments, prototyping, pilot projects, etc. The underlying belief behind these approaches is that municipal administrations could learn to become more innovative as an organization by scaling up projects and initiatives with innovative approaches. In fact, the experimental approach to governance is becoming more popular both in theory and in practice (Bevilacqua et al., 2020; Fastenrath & Coenen, 2021). This is especially true in the technological realm, where the idea of innovation, start-ups, and agile methodology have spilled over into other sectors, especially within the Smart City discourse (see, e.g., public innovation labs). Many projects within municipal administrations are thus starting to experiment with experiment (see, e.g., Eneqvist & Karvonen, 2021; Evans et al., 2021; Fastenrath & Coenen, 2021; Fuglsang & Hansen, 2022; Kronsell & Mukhtar-Landgren, 2018; “Model Projects Archives,” n.d.). Despite the increasing popularity of such projects, there are insufficient empirical studies of whether these approaches achieve their promises of agility and flexibility. In fact, findings from Evans et al. (2021) suggest that *learning* is not a given just by *doing* something, as implied in the term “learning-by-doing”. Instead, they suggested that certain conditions need to be in place in order for learning to truly take place when engaging in “doing”.

Thus, if new and more adaptive forms of governance are necessary for municipal administrations to adequately address the wicked problems facing them, and these governance approaches could be “learned” by “doing”, then some important questions can be raised. Namely, how can the learning process in such learning-by-doing approaches be supported? How can the efficacy of learning be increased for project teams involved in such innovative projects within the municipal administrations?

On a more critical note, does being more innovative (as conceptualized primarily by the private sector and the IT industry) within a municipal administration necessarily lead to an increased capacity for “good urban governance” (Hendriks, 2014)? And does that ultimately lead to benefits to the society?

It is beyond the scope of this research to comprehensively evaluate the possible impacts of “learning to be innovative” within municipal administrations. However, this study aims to contribute to knowledge by shedding some light on this relatively new trend of adopting more prototyping approaches in municipal administrations. Specifically, by taking an action-oriented research approach with a project team within the Municipal Administration of Freiburg, this study aims to explore the learning processes of the project team and how it relates to organizational learning within the organization. This is done by examining the conceptualization of learning and the learning process within the case study, with a particular focus on the challenges to learning and the potential to improve the process.

In summary, the normative orientation of this thesis is that learning and reflection within the municipal administration is a necessary capacity in order to learn alternative approaches to urban governance. These new approaches are, in turn, necessary for the transition to a sustainable future. This raises the following questions. Can this organizational capacity be built through learning-by-doing approaches in projects? And will this learning lead to better governance capacity within municipal administrations, or specifically, to governance approaches more suited to handling wicked problems? This study seeks to gain a better understanding of this phenomenon of learning-by-doing as a project approach by exploring the process, challenges and possibilities of improving it within a case study in a municipal administration.

Research gaps: Practical-knowledge gap, population gap, and empirical gap

Referring to the taxonomy by Miles (2017), I identified three main types of research gaps that I aimed to address in this study: Practical-knowledge gap, population gap, and empirical gap. I provide a summary here and will further elaborate on it in the Literature Review section.

Practical-knowledge gap: If learning is so important, why do municipal administrations still insufficiently focus on it?

A practical-knowledge gap is defined as a “conflict [that] arises when the actual behaviour of the professionals is different from their advocated behaviour. In this case, research could seek to determine the scope of the conflict and to uncover the reasons for its existence” (Möller-Bloch & Kranz, 2014, as cited in Miles 2017, p. 4). Despite the proliferation of literature emphasizing the importance of learning and reflection for governance, there are few examples of public organizations that are considered to be excelling at learning. In fact, Gilson et al. (2009) even argues that “acting as a learning organization is likely to be costly for organizations in several ways, chiefly because change always involves risks and because organizational cultures tend to become conservative, especially in long-lived or successful organizations“ (p. 14). What challenges do practitioners in municipal administrations face that prevent them from engaging in the advocated behaviour from research (i.e. placing importance on learning and reflection)?

Population gap: What do we know about project-based and organizational learning in municipal administrations instead of other contexts?

Miles (2017) defines population gap as a gap arising due to a population that is “not adequately represented or under-researched in the evidence base or prior research” (p. 4). One potential factor for the practical-knowledge gap is due to the evidence base lacking in empirical studies within the population of municipal administrations. Research in organizational learning within municipal administrations is lacking. Typically, the focus has been on organizational learning in the private sector or in the public sector at different levels of government, usually the national level government (Evans et al., 2021; Gilson et al., 2009; Olejarski et al., 2019). More research is necessary to explore the learning processes within municipal administrations, as they face different conditions than in the private sector or in the public sector at higher levels (Evans et al., 2021). Relatedly, another population gap is the lack of focus on the learning from project teams within municipal organizations, although project-based work is becoming increasingly common in this context, for example because of funding programs with limited scope and timeline (Crawford et al., 2003). Some authors argues that projects offer key spaces for learning (DeFillippi, 2001; see, e.g., Sense, 2011), however, most literature on organizational learning and knowledge management provide insights and recommendations for incorporating learning at the organizational level (e.g., the concept of the learning organization; Easterby-Smith et al., 1999). This does not address the significant barriers and challenges that exist in enabling organizational learning through project-based learning (see, e.g., Schindler & Eppler, 2003). Thus, the recommendations from these studies are unhelpful for project teams who do not have capacity nor authority to change the institutional logic of their organizations within the scope of the project.

Empirical gap: Learning-by-doing approaches within city administrations

According to Miles (2017), an empirical gap is defined as when “research findings or propositions need to be

evaluated or empirically verified” (p. 3). Many municipal administrations are undergoing change to become more “agile“ by taking in concepts and methods from the technology industry, such as to learn iteratively by doing (Kronsell & Mukhtar-Landgren, 2018). This is often done in technological-related projects such as Smart Cities initiatives (see, e.g., “Model Projects Archives,” n.d.). Although Kolb’s Experiential Learning Theory (2015) is an established learning theory (Morris, 2020), the empirical base of experiential learning is lacking in studies in the public administration, especially municipal administrations. In addition, one criticism of experiential learning is that it is too focused on individual learning (see, e.g. Loeber et al., 2009), even if it can theoretically be applied in the team setting. Thus, it raises the question of whether the idea of learning-by-doing as depicted in Kolb’s Experiential Learning Theory (ELT) applies within this context. In particular, one key aspect for learning through experiences is the role of reflection, as noted by Kolb (reflective observation as part of the learning cycle), as well as by other authors such as Donald Schön (2008). However, most literature on reflective practice is also focused on the individual level, even though organizational learning literature suggests the importance of learning through social interactions and group reflection, given that reflective practices within groups can be seen as an enabler for organizational learning (see, e.g., Boud et al., 2006; Crossan et al., 1999; Hilden & Tikkanmäki, 2013; Senge, 1994). Therefore, an empirical gap exists on the role of individual vs. group reflection in learning from experiences within projects, and on the applicability of the experiential learning theory in such a group setting. I could not find a study that addresses the role of social reflective practices in learning-by-doing² project approaches within municipal administrations. However, similar studies exist, such as those by Edmondson et al. (2001) and Schippers et al. (2015) in healthcare sciences, Decuyper et al. (2010) in management studies, and Allen et al. (2018) in various settings. This illustrates the connection of this empirical gap with the population gap.

In summary, to address these practical-knowledge, population and empirical research gaps, more research on project teams in municipal administrations is required, in order to explore their learning processes and the challenges in learning through prototyping (learning-by-doing).

Research strategy: Action-oriented case-study exploratory research

Given the research gaps outlined above, a case-study approach can be appropriate, especially one incorporating elements of a transdisciplinary and action-oriented research strategy.

A case study approach is appropriate to address the population and empirical gap by focusing on a case in the under-researched population and phenomenon - in this case learning through prototyping in a project environment in a municipal administration. The DATEN:RAUM:FREIBURG project in the Municipal Administration of Freiburg offers an insightful case study opportunity for this purpose. The project was specifically designed with an explicit focus on learning-by-doing. That is, a phase of prototyping was planned prior to the actual implementation phase of the project. Thus, it can offer insight to address the practical-knowledge gap as a “critical case” (defined as “having strategic importance in relation to the general problem” by Flyvbjerg, 2006, p. 229). More details will be described in the Methodology Section under “Relevance of this Context”).

² I use the term “learning-by-doing”, “experiential learning”, and “learning by prototyping” interchangeably for the purpose of this research.

In addition, a transdisciplinary and action-oriented approach is particularly useful to address the practical-knowledge research gaps. As stated by Flyvbjerg (2006), “it is often more important to clarify the deeper causes behind a given problem and its consequences than to describe the symptoms of the problem and how frequently they occur” (p.11). By involving the participation and the rich contextual knowledge of practitioners, an approach that incorporates elements of transdisciplinarity can more adequately explore the obstacles hindering the practitioners from behaving as advocated in the literature. By incorporating an intervention as part of the study (action-orientation), it can lead to a richer understanding of hidden obstacles in the context that may not be revealed from merely asking the practitioners for self-evaluations. There are many different forms of action research, but for this study I refer to the definition by Altrichter et al. in issue 3 (p. 125-31), as cited in Zuber-Skerritt and Perry (2002, p.173):

- (1) a group of people at work together;
- (2) involved in the cycle of planning, acting, observing and reflecting on their work more deliberately and systematically than usual; and
- (2) producing a public report of that experience (such as a thesis).

This research process and parts of the thesis are organized based on the Plan, Act, Observe, Reflect stages of action research. It starts with a Plan phase of problem definition by gaining a deeper understanding of the phenomenon and the context of the project team. Based on that understanding, three iterations of an intervention were conducted in the Act phase, namely the implementation of group reflection sessions. In the Observe phase, the learning effect of such a social reflective practice is observed. Finally, the Reflect stage is presented as the Overall Discussion section of the thesis. Further details regarding incorporation of elements of action research for this thesis, as well as the advantages and disadvantages of such an approach, are included in the Methodology and Overall Discussion sections.

Research objectives and research questions

The following research objectives and research questions provide a basis to gain a better understanding of the topic in order to achieve the research purpose.

An action-oriented research strategy aims to inform both practice and research (Craig, 2009). The purpose of this research is ultimately to inform practice by increasing understanding of prototyping project approaches within municipal administrations. That is, to understand how these learning-by-doing processes can be improved in practice. To that end, the research objectives are to 1) address the research gaps by exploring the potential role of learning through prototyping as a project approach in enabling organizational transformation in municipal administrations and 2) to explore the challenges of learning from such approaches and what can be potentially done to improve the learning process. In order to address these research objectives, the central research questions can thus be formulated as such: What role can learning-by-doing project approaches play in enabling organizational transformation in municipal administrations? What can be major challenges of learning through such approaches for the project team? And finally, what role can group reflection sessions play in enhancing the learning process of such approaches?

To recap, the following table summarizes the motivation of this research, the research objectives and the research questions guiding this thesis.

Table 1: *Overview of Research Motivation, Research Objectives and Research Questions*

Topic	Guiding question(s)	How this relates to my research
Societal problem and relevance	What is the specific societal problem and why is it important to solve it?	Current governance approaches by municipal administrations are ill-suited to address the complexities of socio-ecological problems. This has severe implications, given increasingly rapid urbanization rates.
Underlying premise / broad theoretical perspective	Based on theory and practice, what could be one approach to address this societal problem?	Municipal administrations need to change their governance approach, which requires organizational learning. In response to that, some administrations are experimenting with new ways of working within projects, as a way to enable organizational learning.
Research “puzzle”	Given this underlying premise, what is the broad research puzzle (discrepancy between my expectations and the reality)? (Schwartz-Shea & Yanow, 2013, pp. 26–34)	If organizational learning in municipal administrations is so challenging (given the intention-implementation gap), to what extent can project approaches that emphasize learning-by-doing address this gap and what barriers do they face?
Research purpose	Why is it important to address this research puzzle (to make this puzzle “less puzzling”)? How does it relate to the societal problem?	By increasing our understanding of the role of project-based experiential learning in organizational learning (especially the potential challenges and possibilities to improve the process), we could increase the capacity for municipal administrations to engage in organizational transformation through organizational learning. This could lead to the adaptation of governance approaches to ones more suited to addressing complex urban challenges.
Research objectives	How can this research address the research purpose? What does this research aim to achieve in order to fulfil the research purpose?	This research aims to explore the role of project-based experiential learning in enabling organizational learning, to identify some challenges in the learning process and potential ways to improve it.
Central research questions	What are the central research questions necessary in order for this research to achieve its objectives?	RQ1: What role can learning-by-doing project approaches play in enabling organizational transformation in municipal administrations? RQ2: What can be major challenges of learning through such approaches for the project team? RQ3: What role can group reflection sessions play in enhancing the learning process of such approaches?

In order to operationalize the research objectives and central research questions, a literature review is first necessary to answer the following question: How can I conceptualize the role of project-based experiential learning approaches in enabling organizational transformation in municipal administrations? Based on the understanding gained from this, the operationalization of the research objective is then provided in the form of the analytical framework at the end of the Literature Review section. This work is characterized as exploratory, mostly due to the lack of existing knowledge in this particular context, as outlined in the research gaps (p. 11).

Potential contributions this study can have for research

To address the research gaps mentioned above, this study aimed to contribute to empirical and conceptual understanding of learning in the context of project-based learning in municipal administrations, thus contributing to the organizational learning literature. In addition to the conceptual understanding from the literature review, by gaining empirical evidence, this study sought to contribute to a deeper understanding of the process of learning-by-doing in project teams within municipal administrations, and the role that social reflective practices can play in the learning process. The following table summarizes the potential contributions based on the research gaps.

Table 2: *Potential Contributions to Research*

Research gap	Attempts to address	Potential contribution to research
Practical-knowledge gap	Incorporated elements of transdisciplinary, action-oriented research	Provide deeper insights into potential hidden challenges facing practitioners in municipal administrations that hinder organization learning for organizational transformation
Population gap	Focused on one case study within the population (project team engaging in learning-by-prototyping in a municipal administration)	Provide insights into factors that are potentially important in this population group
Empirical gap	Intervention-based action research	Provide insights into the potential role of social reflective practice in connecting individual and group learning and reflection with learning from experiences

Outline of the thesis

I structured this thesis in the following manner. Section 1, the Introduction and Background section, provides a background to the study with an overview of learning in municipal administrations towards new approaches to governance. This section also introduces the research objectives and the research approach. This is followed by Section 2, the Literature Review and Analytical Framework section, which provides an overview of the relevant concepts from the literature, elaboration on the research gap, and the operationalization of the research objectives in view of the literature. Section 3, the Methodology section, describes the research design, the case study context, and the potentials and pitfalls of the action research approach. Next, Section 4, the Findings and Discussion section, present the findings organized along three of the four phases of the action research cycle – Plan, Act, and Observe. Section 5, the Overall Discussion section, corresponds to the fourth phase, the Reflect phase of action research. This section presents a summary of the key findings and revisits research objectives. In addition, reflections on the limitations of the study and suggestions for possible future research avenues are included. Finally, Section 6 provides the conclusion, highlighting key implications to practice and contributions to scientific knowledge. Given the interpretive, iterative and process-based nature of action-oriented research, I included my reflections on the process in specific subsections at the end of each section from Section 2 to 5, describing my learning process along the way and the potential implications of the methodology on the research findings and interpretations.

Section 2 - Literature Review and Analytical Framework

Introduction to the literature review section: Goals, process, structure

The goals of this literature review are to 1) provide an overview of relevant literature and placing the research within the literature, including delineating aspects of the phenomenon under consideration, and 2) to develop an analytical framework for aspects of the case study based on relevant theories.

In line with the process and concept of interpretive research design as described by (Schwartz-Shea & Yanow, 2013), my theoretical understanding of the phenomenon changed iteratively as I navigated between the empirical data I have collected and my return to literature, thus I have adapted my research design continuously with both input from the empirical data and the data collection process, as well as from iterative literature reviews. However, not all aspects of the analytical framework developed after the beginning of my research can be adequately explored within my research, as the reflections of these concepts occurred concurrently with the research, and a redesign was not possible to adequately address them. These reflections will mainly be addressed in the reflection subsections throughout the thesis.

This literature review covers the following topics in this order: 1) Conceptualization of learning and reflection for organizational change towards new governance approaches, 2) project-based learning as a component of organizational learning, 3) experiential learning as a process of learning in projects, especially in learning-by-doing approaches, and the 4) role of social reflective practices in facilitating learning.

First, by deriving the concepts of learning and reflection from the need for organizational change, I seek to delineate the concepts of learning and reflection for this study, in particular as it relates to the capacity for municipal administrations to change their way of working and adopt new approaches to governance. Second, this is followed by the exploration of project-based learning as a component of the organizational learning process, providing some justification for the need to address the research gap on learning in project teams, due to their role in enabling organizational change. Third, in order to address the research purpose, an understanding of the process of learning-by-doing (such as through prototyping) in project teams is necessary. In particular, theories of experiential and organizational learning are especially relevant within the project team environment. Finally, the last topic on the role of social reflective practices relates the scientific literature to the practical problem of how to facilitate learning processes, specifically providing a theoretical basis for the planned intervention of this action-oriented research. The goal of this literature review is mainly to provide an orientation on how the theories and concepts relate to the study, given that this study is not a conceptual paper and thus cannot expand upon this topic in more detail.

Conceptualization of learning and reflection for organizational change

Due to the conceptual diversity in theory and in practice, it is necessary to first start with a brief conceptualization of learning for this study, specifically of organizational learning. Although primarily in the domain of management and organizational studies (for literature reviews, see e.g. Bapuji & Crossan, 2004; Basten & Haamann, 2018; Easterby-Smith et al., 2000; Wang & Ahmed, 2003), the concept of

organizational learning does span across other disciplines and is underpinned by different learning theories such as cognitivism, behaviourism, social constructivism, etc. (for an overview of the history of learning theories, see Illeris, 2018). As Olejarski et al. (2019) note in their literature review, “at the most fundamental level, questions exist surrounding the learning process itself and the dynamic between individual and organizational learning” (p. 71). This conceptual diversity leads to some conceptual confusion, whereby different ideas are referred to when referring to organizational learning and how it works (Easterby-Smith et al., 1999; Wang & Ahmed, 2003). This corresponds to criticism regarding the concept of learning within environmental sciences and adaptive governance as well. For example, Armitage et al. (2008) argue that, “despite widespread support of learning as a normative goal and process, core concepts, assumptions and approaches to learning have been applied in vague and sometimes uncritical ways” (p. 86). To further illustrate this point, an incomplete list of definitions for organizational learning from various sources during my literature review is presented in Appendix A1: Definition of organizational learning from literature (p. 125), including a table from Wang and Ahmed (2003) that summarizes the different conceptualizations of organizational learning from their literature review. Several authors attempted to address this conceptual confusion, such as by connecting the divide between knowledge management and organizational learning (Brix, 2017), clarifying the concept of organizational learning vs. the learning organization (Örtenblad, 2002, 2002; Serrat, 2009). In addition, Chiva and Alegre (2005) attempts to clarify the concepts of organizational learning and organizational knowledge by presenting two different underlying epistemological perspectives within the literature which they term the *cognitive-possession* vs. *social-process* perspective of organizational knowledge. They argue that this epistemological divide is the reason for the lack of conceptual clarity. Their definitions of both perspectives is shown in the table below.

Table 3: Organizational Learning and Organizational Knowledge Perspectives

Learning	Organizational learning	Knowledge	Organizational knowledge
Individual learning	Cognitive	Cognitive-possession	Individual knowledge shared between all the members of a company. Knowledge embedded in rules and routines. Personifies the organization. Individual knowledge generates and contributes to the development of organizational or collective knowledge.
Social learning	Social	Social-process	Implicit and social, beliefs developed by individuals in groups or through inter-personal relationships. Forms the base of a dynamic theory of the company (knowledge is a process).

Note: Taken from Chiva and Alegre (2005, p. 61)

Although it is beyond the scope of this thesis to delve into this debate, the conceptual diversity in the literature suggests that it is nevertheless crucial to start with a brief conceptualization of organizational learning (and the underlying perspective of learning) for the purpose of this study, in order to delineate the concepts that are referred to here.

I treat the conceptualization of learning differently within the study. First, within the literature review section, I follow the lead of Loeber et al. (2009) in exploring the concept of learning as a means to an end in order to explore the *characteristics of learning* that are necessary for a particular purpose. This provides the basis for determining the theoretical framework that most aligns with this conceptualization. Second, in the Findings and Discussion section, I refer to the analytical categorization of Armitage et al. (2008) as a way of understanding the conceptualization of learning within the case study context. This allows me to explore the *idea of learning in the context* without unduly imposing my judgment as constraints, which allows for a richer understanding of the situation by comparing “as-is” vs. the “ought-to-be”. The structure they propose is: “(i) definitions of learning, (ii) learning goals and expectations, (iii) mechanisms by which learning takes place, (iv) questions regarding who is involved in the process of learning, (v) the risks and ethical ambiguities faced by different actors expected to willingly participate in a learning process, whether formal or informal” (p. 87). Given the diversity of the concept of organizational learning, I found the analytical categories to be insufficient in providing a lens with which to view the learning and reflection for this study. Instead, the approach of Loeber et al. was more productive.

Loeber et al. (2009) argues that, as sustainable development is a contestable, normative and revolutionary concept, learning for sustainable development thus need to be conceptualized as: 1) a process of reviewing tacit theories, beliefs and assumptions that actors hold, 2) occurring through the course of social practices that entail explicating tacit knowledge towards congruency of meaning, and 3) including system learning, which is the “unpacking” of self-evident assumptions through the interrelatedness of structure and action. In this concept, reflection is implied as a way to enable learning (as a means), for example, learning by reflecting on tacit theories. Although this concept of learning is based on system innovation projects for sustainable developments, which typically encompass many stakeholder groups, it could still be a meaningful basis for municipal administrations aiming to change their governance approaches through organizational transformation. This is because forms of new urban governance also have characteristics of being contestable (how do we know if we have the ‘correct’ governance approach), normative (governance has to be ‘good governance’), and revolutionary (we need to change the underlying thinking behind the system – old ways of thinking about governance). Furthermore, municipal administrations can be quite heterogeneous groups because of the organizational structure, as departments are sometimes quite independent of each other and have their own institutional logic. This suggests that in order for municipal administrations to improve or change their approaches to governance as an organization, it is not enough to just for the employees to learn new, more “innovative” methods of working. Instead, the learning process needs to allow the employees to review their underlying assumptions and beliefs, such as by being aware of their understanding of how they define a problem, how it should be approached and resolved. In addition, municipal administrations need to create spaces with “atmosphere of trust and mutual dependence” (Loeber et al., 2009, p. 95) within the organization in order to engage in social practices that will lead towards a joint understanding of the need for change and a shared vision of what new approaches to governance looks like. Finally, learning for alternative forms of governance also entails “system learning”, learning to understand the interrelationships between the structures in which they operate and their own practices. This could mean to understand the role of the municipal administration at large, in relation to the societal and governance structures they are embedded in. It also includes understanding the role of the individuals in the administration and their role in upholding structures that perpetuate old ways of working.

The conceptualization from Loeber et al. (2009) incorporates literature from organizational learning, including authors such as Peter Senge (1994), Chris Argyris (1995) and Donald Schön (2008). In particular, it emphasizes the necessity of continuously reflecting on one's own practices to uncover the underlying assumptions that block necessary change. In addition, these authors share a common underlying theoretical perspective of learning, which is social constructivism. Social constructivism holds that knowledge is “the sets of beliefs or mental models people use to interpret actions and events in the world” (Jackson, 2010, p. 168). According to this perspective, “language, artefacts and symbolic behaviour are the shared, physical embodiment of a group's collective, permanent solutions to its ongoing problems. These solutions persist in groups as interpretive structures which are continually articulated, enacted and thereby re-created in processes of social behaviour” (p. 168). Jackson identifies these as the guiding principles of the social constructivist perspective of learning (p. 168):

- Knowledge is constructed through human activity
- Reality is created jointly by members of a society
- Learning is an active and social process
- Individuals create meaning through interactions with others and environments
- Meaningful learning occurs when individuals engage in social activities.

In addition, although most definitions of organizational learning imply that the reason for learning is that learning is necessary in order to improve, what constitutes as improvement is not always clear. An organization can learn to be better at performing its tasks (improvement of organizational performance) but over time, even if they succeed to be better (faster, more efficient) at doing their tasks, they may lose sight of the fact that these tasks are no longer appropriate given the changing conditions of the environment they operate in. Thus, in the case of conceptualizing learning as a means to enable organizational transformation towards more suitable governance approaches, the concept of learning needs to go beyond a simplistic notion of improvement. In particular, it needs to take into account that the end goal is not to be better at doing the same things, but to be better at solving the evolving demands in a world of uncertainty, ambiguity, and change. Thus, the organizational learning that municipal administrations need to engage in should include an element of *higher-order learning*. In the organizational learning literature, this is often referred to as double-loop and triple-loop learning (vs. single-loop learning), based on the concepts from Argyris and Schön (1978), who took inspiration from Gregory Bateson (1972, as cited in Sterling, 2010, p. 20). These concepts are summarized in Table 4 below, which is adapted from Sterling (2010, p. 25) with the addition of the corresponding loops of learning from Argyris and Schön (1978).

Table 4: *Levels of Learning*

Orders of change/learning	Seeks/leads to:	Can be labelled as:	Corresponds to:
First order change Cognition	Effectiveness/Efficacy	‘Doing things better’ Conformative	Single-loop learning
Second order change Meta-cognition	Examining and changing assumptions	‘Doing better things’ Reformative	Double-loop learning
Third order change Epistemic learning	Paradigm change	‘Seeing things differently’ Transformative	Triple-loop learning

Note: Adapted from Sterling (2010, p. 25)

In the context of municipal administrations' governance approach, single-loop learning (leading to first order change) could come from engaging with questions such as "How can we involve citizens more actively as end-users to test the services we are developing?" Double-loop learning (leading to second order change) may come from engaging in questions such as "Will engaging with citizens only during the end-user test phase really lead to a service that can better fulfil their needs?" Finally, triple-loop learning (leading to third order change) may come from engaging in questions like: "Why do we believe that the correct relationship to citizens is to treat them as end users? What if we were to treat them as decision-makers and view as our bosses?"

The understanding of epistemic learning or triple-loop learning aligns with the idea of transformative learning from Jack Mezirow (1990). According to Mezirow, transformative learning "refers to transforming a problematic frame of reference to make it more dependable ... by generating opinions and interactions that are more justified. We become critically reflective of those beliefs that become problematic" (p. 20). Key to the idea of transformative learning is the critical reflective process that is necessary to question the presuppositions on which our beliefs are based, upon which we make interpretations and take action. This can be seen as a process to move from single-loop learning to the double- or triple-loop learning. Mezirow further distinguishes between instrumental and communicative learning. Instrumental learning refers task-oriented problem-solving process, of "learning to control and manipulate the environment or other people". In the other hand, communicative learning refers to learning to understand "the meaning of what others communicate concerning values, ideals, feelings, moral decisions ... and other norm-governed concepts" (p. 8). Although Mezirow's theory is based on individual learning, one can see the importance of communicative learning for an organizational environment. For example, in order for a municipal administration to change its governance approach (to change practices and how it relates to other actors in urban governance), individuals within the administration need to communicate with each other and come to a shared understanding that will lead to a change in how things are perceived or done within the organization. This means that it would not be enough for several individuals or teams to engage in instrumental learning (e.g., learning new problem-solving methods in alternative approaches to governance), communicative learning is also required in order to establish these new approaches into the organization. According to Mezirow, critical reflection towards transformative learning can occur in either learning domains.

Learning and reflection thus play various roles in organizational learning towards adapting governance approaches. First, municipal administrations must acquire knowledge about different approaches to governance, as well as the skill to implement them, such as learning about specific methods or frameworks related to these approaches (instrumental learning). In order for this to become *organizational* learning, this needs to include not only individual learning but changes in organizational practices, which requires learning how to manage organizational change. Second, many of the new modes of governance themselves require learning and reflection as part of the governance approach, in order to remain adaptive and flexible in the face of ambiguity and uncertainty. In this case, the capacity to learn and reflect is what needs to be learned. Third, and most importantly, since no mode of governance can be proven to be the best approach in all contexts, it requires municipal administrations to be reflective in their use of any governance approach. As an organization, they need to evaluate if it is appropriate, to review their process of deciding on one approach over the other, and to reflect critically on what they consider appropriate. Thus, reflection plays an important role in learning, both as a means to enable learning and as a capacity that needs to be learned.

By conceptualizing organizational learning with an emphasis on the end goal of organizational change and transformation (new governance approaches), what constitutes learning can be delineated, as well as the relation between reflection and learning. With this in mind, I shall explore the organizational learning process and the relation between individual, team, and organizational learning.

Project teams as generative learning spaces for organizational learning

What does it mean for an organization to be able to learn? Based on the conceptualization above, what kind of learning process is called for when there is no clear curriculum to be followed, but rather when double- and triple-loop learning is necessary? This type of deeper, transformational learning at the organizational level takes significant time and effort. It requires not only transforming the practices and structures that are already institutionalized, but to go beyond and challenge the underlying beliefs underpinning these practices and structures. This process cannot be viewed as a uni-directional process. For example, from individual learning to organizational learning (e.g., employees learning new ways of working which leads to setting up new work practices) or vice versa (e.g., top-down implementation of new structures to change individuals' ways of working). Instead, it should be viewed as a bidirectional, recursive process. One key framework that attempts to show the relations between the individual, group and organizational learning is Crossan et al.'s (1999) 4I model of organizational learning for strategic renewal (Figure 1 below). In this framework, the three levels of learning (individual, team, organizational) are connected by four bi-directional sub-processes: *intuiting*, *interpreting*, *integrating* and *institutionalizing*.

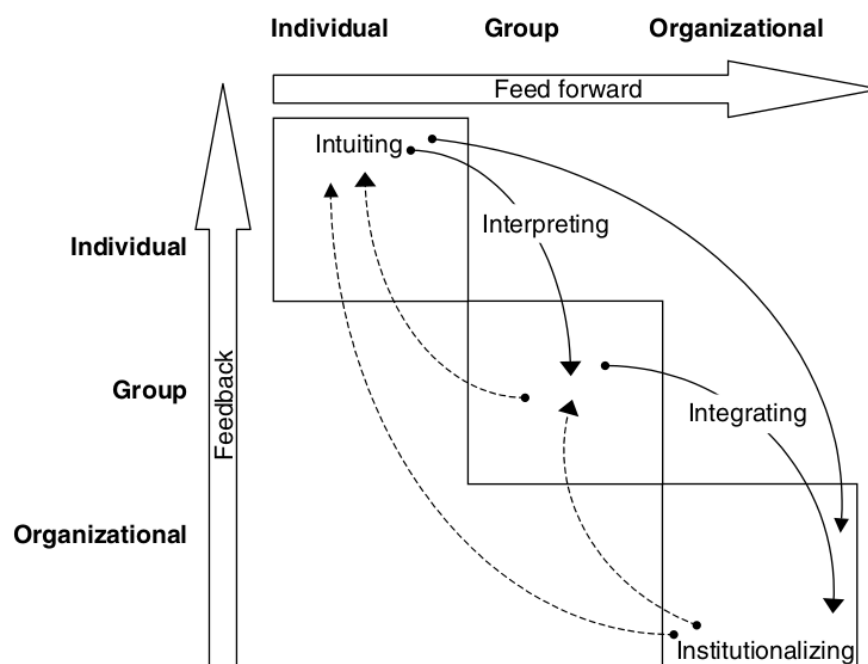


Figure 1: Organizational Learning as a Dynamic Process

Note: Taken from Crossan and Berdrow (2003, p. 1091)

Crossan et al. (1999, p. 525) defines the learning processes as follows:

Intuiting is the preconscious recognition of the pattern and/or possibilities inherent in a personal stream of experience. This process can affect the intuitive individual's behaviour, but it only affects others as they attempt to (inter)act with that individual.

Interpreting is the explaining of an insight, or idea to one's self and to others. This process goes from the preverbal to the verbal and requires the development of language.

Integrating is the process of developing shared understanding amongst individuals and the taking of coordinated action through mutual adjustment. Dialogue and joint action are crucial to the development of shared understanding. This process will initially be ad hoc and informal, but if the coordinated action taking is recurring and significant it will be institutionalized.

Institutionalizing is the process of ensuring that routinized actions occur. Tasks are defined, actions specified and organizational mechanisms put in place to ensure that certain actions occur. Institutionalizing is the process of embedding learning that has occurred by individuals and groups into the institutions of the organization including systems, structures, procedures, and strategy.

It must be noted that Crossan et al. (1999) formulated this framework with the concept of organizational learning as the "principal means of achieving strategic renewal for enterprises" (p. 522). Specifically, renewal requires that organizations "explore and learn new ways while concurrently exploiting what they have already learned" (March, 1991 as cited in Crossan et al., 1999), whereas strategic refers to the process including the entire organization and not just individual or group and that the organization operates in an open system. Their focus on private enterprises led to including concepts such as having competitive advantage, concepts that arguably should not be a primary concern for municipal administrations. However, it is possible to adapt this concept of strategic renewal to the context of municipal administrations. For example, in the case of municipal administration, strategic renewal can be seen as the organizational transformation necessary to adopt alternative modes of governance, in order to better address the complexity of the challenges currently facing cities. Hereafter, when referring to strategic renewal or organizational transformation for municipal administrations, I will refer to this idea of transforming governance approaches to better address complex urban challenges.

Besides describing the mechanisms of learning at each level, this model provides a process-based view of the relations between the levels of learning via the feed forward and feedback loop. However, these processes do not inherently have a positive effect on organizational learning for transformation (Crossan & Berdrow, 2003). For example, in the case of municipal administrations, political leaders at the top may espouse the need for change and transformation within the administration, stating it in the strategy (*feedback*). However, employees may experience skepticism (*intuiting*) of the possibility of change given the rigid structure of the organization (*feedback of the structure onto the intuiting process*) and express their skepticism within their groups (*interpreting*), coming to a shared understanding of the "empty promise" of the leaders (*integrating*), thus reducing the chance of *institutionalizing* any changes in their routines (*feed forward*). Thus, the subprocesses could both support or hinder organizational change. That is, failure for organizational transformation can arise not just from blockages of these subprocesses. Instead, challenges in *learning for the right purpose* from these subprocesses can also play a role. This additionally provides a conceptual

justification for the focus on group or team learning³ as they are a crucial mediator between organizational and individual learning. In fact, Senge (1994) goes so far as to state (p. 220):

Individual learning, at some level, is irrelevant for organizational learning. Individuals learn all the time and yet there is no organizational learning. But if teams learn, they become a microcosm for learning throughout the organization. Insights gained are put into action. Skills developed can propagate to other individuals and to other teams (although there is no guarantee that they will propagate). The team's accomplishments can set the tone and establish a standard for learning together for the larger organization.

However, the 4I model does not adequately take into account historical and social factors external to the organization, although their idea of “strategic” encompasses a view of the organization as a open system. For example, the role of social norms or other societal beliefs (such as neoliberal ideas of government) in affecting the institutional logic is not adequately depicted. Instead, the framework gives the impression of having a myopic focus only on the organization. Regardless, these external factors could be seen as less direct and harder to study and influence than the interactions between individuals and groups in pursuit of organizational learning. In practice, it is more within the sphere of influence for an organization to create spaces for employees to establish new interpretive structures than to change the dominant societal discourse affecting them. According to Sense (2011), project team provides exactly this space to create new interpretive structures. He argues this is because the project environment establishes a generative on-the-job learning environment by having a bounded and dynamic learning place, an eclectic participant base for learning, multiple reflection and interaction opportunities, and relative psychological safety to explore issues. This view that project-based learning is instrumental to organizational learning is also further supported in the literature (see e.g. Ayas & Zeniuk, 2001; Decuyper et al., 2010; DeFillippi, 2001; Grabher, 2004; Kotnour, 2000; Raelin, 2001; Sense, 2009). Thus, project teams can be seen as providing a more productive learning space than a stable workgroup. For example, as the project team (composed of members from heterogeneous backgrounds and departments) comes together to try to achieve a specific project objective in a time-bound context, this leads to more interactions to search for common ground in order to work together. Individuals in the project team may thus be more likely to become aware of their implicitly held assumptions and beliefs when they observe the differences with the others project members or when these assumptions are questioned or challenged. Consequently, this more intensive exchange between the individuals could lead to higher-order learning. This corresponds as well to the popular Team Development Model by Bruce Tuckman (1965) - Forming, Storming, Norming and Performing. However, Schindler and Eppler (2003) caution that despite the high level of learning that can occur in the project teams, these lessons learned are often not *institutionalized* into the organization, as the bounded learning place mentioned by Sense means that the project team disbands at the end, often without embedding their learning into the organization's structures or procedures. In addition, Leeuwis (2004, as cited in Gilson et al., 2009) argues that for effective learning from reflection, (proper) feedback on the consequences of one's actions is essential. However, the types of feedback from such projects are varied and not immediate. For example, there could be slow diffusion of the impact of a more agile way of working within the municipal administration, that could, over time, lead to embracing new approaches to governance. Thus, I posit that reflection in a group is especially necessary in order to collectively construct and evaluate the feedback of the consequences, because proper feedback is not realistic within the time frames of a project.

3 I use team and group learning interchangeably in this thesis

Experiential learning as enabler for project-based learning

So far, I have established the need for learning for municipal administrations for strategic renewal and the role that project teams can play in this process of organizational learning, but it is still not clear how learning within the project teams happens specifically. The 4I model envisions that the organizational learning process happens continuously within daily operations, as expert and entrepreneurial intuition are engaged in a tension between exploitation of existing knowledge and exploration of new knowledge (Crossan et al., 1999). However, project teams, unlike existing workgroups, are already slightly elevated out of the daily operations in a sense – by being given a specific time-bound context in which some project goal must be achieved. This is often related to but not seen as part of the daily operations. In these cases, the 4I model does not specify, for instance, what exactly from the stream of experiences do individuals intuit on, interpret and then integrate into teams? Although Crossan et al. mention the role of expert and entrepreneurial intuition in the intuiting process, this does not provide much clarity on the process itself. One possibility would be to explore this through the idea of learning-by-doing, which is emphasized in the concepts of on-the-job learning and especially project-based learning. Especially when considering learning new (and potentially complex) ways of doing things, exploration through an iterative approach of trial-and-error is important. It follows then that the “doing” provides the basis for the experiences that the individual can then intuit about.

One of the key theories in learning-by-doing is David Kolb’s (2015) Experiential Learning Theory (ELT). Often contrasted against learning by thinking or learning by studying (either through self-directed learning or through training/class settings), Kolb’s ELT serves as a good basis to conceptualize the process of learning from experience. According to Kolb, “Learning is the process whereby knowledge is created through the transformation of experience” (p. 67). In his model, experiential learning happens through four phases: concrete experience, reflective observation, abstract conceptualization, and active experimentation. His theory attempts to integrate cognitive and behavioural perspectives from three traditions or thinkers (Kurt Lewin, John Dewey, and Jean Piaget), which he claims to share a perspective on learning characterized by the following propositions (pp. 37 - 49):

- Learning is best conceived as a process, not in terms of outcomes
- Learning is a continuous process grounded in experience
- The process of learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world
- Learning is an holistic process of adaptation to the world
- Learning is the process of creating knowledge

Many of these propositions also align with the guiding principle of social constructivism of knowledge, as Kolb’s theory is also underpinned by this perspective. However, one difference here is his idea that learning requires the resolution of dialectic tensions. Underpinning the four phases of ELT are the dialectic tensions between apprehension and comprehension, and between extension and intention. This framework is presented below visually in Figure 2, taken from Kolb (2015, p. 68).

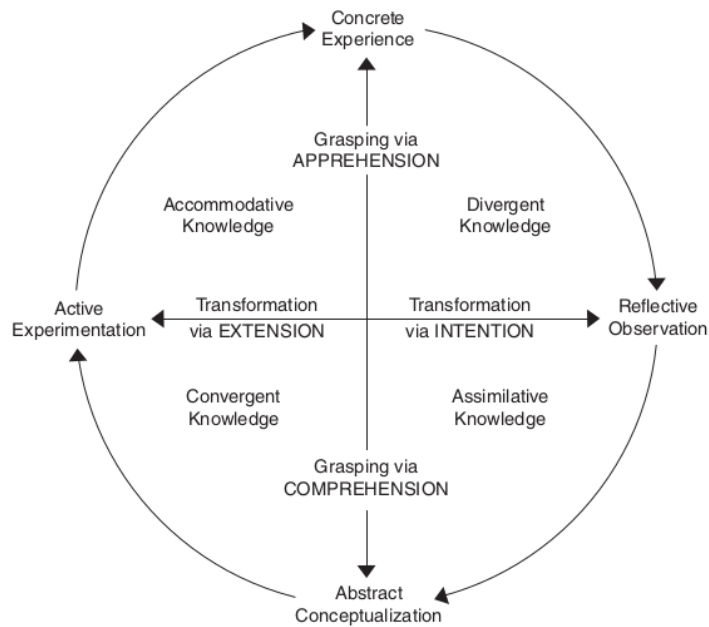


Figure 2: Structural Dimensions Underlying the Process of Experiential Learning and the Resulting Basic Knowledge Forms

Note: Taken from Kolb (2015, p. 68)

This framework seems appropriate to be used to study the process of learning through prototyping, which is a way of “doing” to gather experiences in order to learn from them. This approach of trying out on a smaller scale (a prototype) in order to learn from the experiences and to inform future action, corresponds in fact to the “learning spiral” from Kolb as an update to the original “learning cycle”. That is, learning should not be conceived as a closed loop, but that the actions from the first cycle leads to the concrete experiences of the next cycle, which then “becomes a spiral through successive iterations of experiencing, reflecting, thinking, and acting to create new experiences for another cycling through the learning process” (p. 186).

However, there are several aspects that this theory does not adequately address. First, as Kolb (2015) also readily admits, there are some conceptual blurriness in his theory. For example, the concept of “concrete experience”. Some part of the book refers to it as the “pure experience” (that is, one prior to processing, somewhat similar to the idea of pre-verbal intuiting from the 4I model). However, with team learning, there would be too many “moments of experiences” in the project to reflect on as a team, even with Kolb’s clarification that the perceiving of these experiences usually arise from a discomfort because of a discrepancy or friction between our expectations and reality (Kolb, 2015, p. 59). (Morris, 2020) suggests that instead of the conceptualization of concrete experience based on the sensory cortex, it is more appropriate to consider the contextually rich experience embodied in a specific time and place as an element of the learning process. This suggests that a focus on a time- and context-bound project can be productive to provide the contextually rich experience from which to learn.

Second, the richness of Kolb’s (2015) experiential learning theory is often simplified in its application and thus generating criticisms (see Kolb 2015, p. 52 – 56 for his summary of some criticisms and his responses).

In line with that, Loeber et al. (2009) argues that neither the contextual aspect of learning nor the values and interests that influence human action are adequately taken into consideration. For example, although Kolb's experiential learning theory is based on social constructivist perspective, his model has been criticized as being overly individualistic and cognitive, given that the model itself does not call to attention the role socialization plays in framing our mental models, which then frame how and what we see in the world (e.g., what is even perceived as an "experience"). For Loeber et al., Schön's seminal concept of the *reflective practitioner* (Schön, 2008) offers more insight into these areas. Schön believes that cognition cannot be separated from values and beliefs, nor can it be separated from action, as opposed to Kolb's idea of the dialectic tension. According to Schön, professionals approach problems with certain theories-in-use that are mental maps of theoretical, normative and empirical considerations, embedded in the institutional logic. Even when these theories-in-use contradict espoused theories, certain defensive routines may prevent them from being exposed or change. Thus, Argyris and Schön (1978) suggest "to make explicit what is implicit in people's practices", such as through complementing inquiry with deliberation (*reflection-on-action*). This corresponds to Kolb's idea of reflective observation in the ELT. He claims in his updated book (with his response to these criticisms) that the model is built on theoretical foundations that contain these assumptions. Thus one can view these mental maps or theories-in-use as the backdrop of the entire experiential learning, as these theories-in-use both shape how we experience our *concrete experience*, how we *reflectively observe* it, how we *abstractly conceptualize* from it and how we decide to *experiment actively* for future action. This implies that reflection is exceptionally important in the learning process, not only to reflect on the experience itself, but to become aware of these underlying mental models and the discrepancies between our theories-in-use and our espoused theories. In particular, reflecting with others, if done correctly, can be exceptionally fruitful to expose our blind spots to ourselves (Raelin, 2001; Senge, 1994). However, it remains to be seen if it is realistic to apply the framework in a way that adequately takes this into consideration.

Third, although Kolb (2015) claims that the cycle could be applied in a team setting, the focus of his book is on the individual level, and it is questionable how to apply it within groups. One exception is the paper by Kayes et al. (2005), but their focus was more on the individual learning styles (also part of Kolb's ELT and its relation with team roles and the team process, rather than the team learning process through ELT. Should groups be conceptualized as a collection of individuals each going through the process and then exchanging in certain phases, such as the reflective observation phase? Or should a group be conceptualized as an entity *existing outside* of the individuals that goes through the cycle as one entity? Some authors have attempted to integrate Kolb's ELT with the 4I model by using the ELT to describe the individual learning stage, prior to integrating that learning into the group. But I found this unsatisfactory because that is too individual and cognitive of a view that does not take into account the social construction of knowledge. For example, as the 4I model suggests, there is a feedback loop from the team to the individual in the interpreting process, meaning that a team can influence how an individual interprets an experience, such as through social interactions in which a dominant view in the team may be expressed and shapes the formulation of individual perception. Thus, an individual does not necessarily "complete" Kolb's learning cycle (including taking action through active experimentation) before arriving to the interpreting process, e.g., to share what they learned with the team. In addition, how one decides as a team to act on the what one has learned from experience requires negotiation to come to a joint resolution. Furthermore, when considering what individuals may share as the "concrete experience" as the basis of the learning cycle, factors beyond intuiting and more towards interpreting need to be considered. For example, certain factors may play a part in what

motivates an individual to “speak up” about their intuiting process, such as emotion (how strongly do I feel about this discomfort; see, e.g., Elkjaer, 2004), personality (how easily I share my thoughts), or power relations (how much influence I have on the team, see, e.g., Vince, 2002) . Thus, if considering learning-by-doing as a team, the different aspects of Kolb’s experiential learning theory needs to be more embedded with the social practices and should not be relegated just to the individual learning level. In particular, the relation between individual and collaborative reflection can be a productive area of inquiry.

Social reflection and shared meaning-making as facilitator between individual, team and organizational learning

The importance of reflection in learning is often illustrated with this quote from the American educator and philosopher, John Dewey, “We do not learn from experience ... we learn from reflecting on experience.” As mentioned above, when considering the conceptualization of organizational learning for transformation, this aspect of reflection is particularly crucial. Although reflection is often used as an umbrella term meaning different things, in this study I refer to the definition by Hilden and Tikkamäki (2013, p. 82), who describe reflection as “a complex, active and purposeful mental process of becoming aware of old meanings, exploring alternative interpretations, engaging in dialogue and shifting modes of thinking, feeling and acting. It is triggered by meaningful experience and leads often to unexpected outcomes“. Kolb’s ELT (2015) and the concept of transformative learning by Mezirow (1990) emphasize its importance. In organizational learning, Schön (2008) identified the central role of reflection in becoming reflective practitioners, and Senge (1994) acknowledged the importance of reflection to become aware of and to challenge mental models that are barriers to problem-solving. In these situations, individual learning through reflection are assumed to then lead to organizational learning. That is, it is assumed that an organization with more reflective practitioners will be better at resolving problems. However, these perspectives focus mostly on the individual. An individual’s reflection could serve as input for team and organizational learning, such as when a change in an individual’s cognition lead to a change in their behaviour, which then influences other individuals. However, this is too narrow a focus given the complexity of the organizational learning process, such as indicated in the 4I model. Instead, one should consider the relation between individual and collaborative reflection to be more interrelated, such as in the illustration taken from Knipfer et al. (2013, p. 37), depicted in Figure 3 below. In this model, individual reflection and reflection with others (collaborative reflection) interact and shape each other’s reflection outcomes via processes of articulation and negotiation (interpreting and integrating, which requires communicative learning). However, this process is still somewhat simplistic and mechanistic (suggesting a clear step-by-step process, whereas the actual process is more complex and iterative).

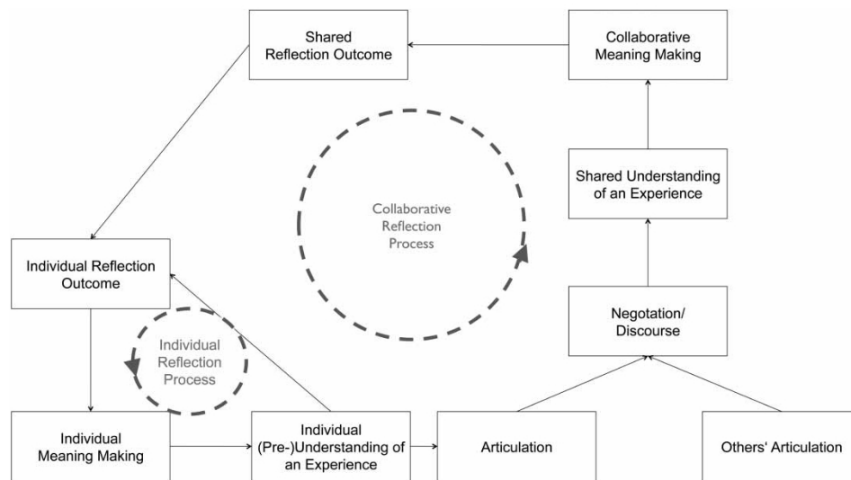


Figure 3: The interrelationship of individual and collaborative reflection

Note: Taken from Knipfer et al. (2013, p. 37), based on Stahl's model of collaborative knowledge building, 2006

Building upon these reflection outcomes, learning from these levels can only be considered organizational if it leads to institutionalizing. In fact, Hilden and Tikkamäki (2013) argue that reflective practice at all three levels of individual, group and organizational levels is the crucial component to organizational learning. Reflective practice, described as “the actual ways in which reflection is manifested through individual and collective action within the organizational realm”, “allows the members of the organization to slow down to critically evaluate their own thinking, but also, to investigate the shared, collective assumptions and expectations, as well as the institutionalized rules and routines” (p. 82). By combining the 4I framework with the concept of reflection, they identified the concepts of reflective capacity at the individual level, reflective dialogue at the team level, and reflective management controls at the organizational level as enablers for organizational learning. This is illustrated in the figure below, from Hilden and Tikkamäki (2013, p. 82).

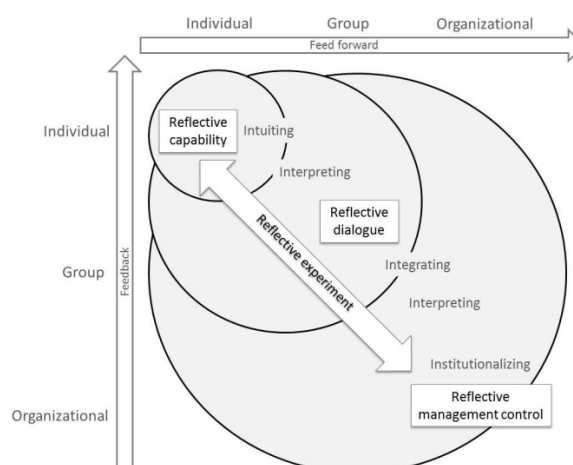


Figure 4: Reflective practice enabling 4I learning processes

Note: Taken from Hilden and Tikkamäki (2013), p. 82.

For example, if mental models are our ways of seeing the world that we are not even aware of, it is conceivable that even a “shock” or dissonance from the discrepancy between reality and our expectations may not necessarily lead us to see the failings of our mental models and adjust accordingly (Senge, 1994). In fact, Argyris (1995) argues that since this process is very uncomfortable and painful, he believes that we have specifically developed defensive routines to avoid becoming aware of the shortcomings of our mental models. In this case, the tacit assumptions may need to be addressed through social reflective practices (e.g., as others challenge one’s own assumptions in the process), in order for one to be forced to confront one’s own assumption. Thus, the purpose of social reflective practices in this case is to support individual learning by revealing discrepancies between theories-in-use and espoused theories that may be hindering the individual from achieving their goals. This is supported by the findings from McCrocy (2016) who suggested that if experiential learning is a shared experience, it can lead to social learning, which contributes towards transformational learning.

But, beyond the changing of individual assumptions, the social reflection must also lead to changes in the team’s beliefs and assumptions (shared ideas among the members) about their own practices and how it is influenced by and influence the structure within which they work. This is in line with the concept of Team Learning from Senge (1994), which he defines as “the process of aligning and developing the capacity of a team to create the results its members, truly desire” (p.220). According to Senge, team learning requires the team to distinguish and become proficient in two distinct but potentially complementary ways to converse: dialogue and discussion. Senge (1994) defines both terms:

In dialogue, there is the free and creative exploration of complex and subtle issues, a deep “listening” to one another and suspending of one’s own views. By contrast, in discussion different views are presented and defended and there is a search for the best view to support decisions that must be made at this time. (p. 220)

Based on Bohmian’s idea of dialogue, the conditions Senge considers necessary for dialogue to flourish are: 1) participants must “suspend” their assumptions, 2) regard one another as colleagues, and 3) there must be a facilitator who holds the context of dialogue. This is also in line with the literature review from Chiva and Alegre (2005), who cited various authors (Dixon, 1997; Isaacs and Schein, 1993; and Oswick et al., 2000) in noting the importance of dialogue to bridge the gap between individual and organizational learning.

Conditions and skills for social reflective practice

Given the importance of project teams in enabling organizational learning as discussed, a group reflection session as a social reflective practice can be an important part of shared meaning-making (interpreting) in order to create congruence in actions (integrating) which can ultimately lead to institutionalizing at the organizational level. Faller et al. (2020) defines this as the constructivist perspective of reflection (see p. 251 in their paper for a summary of other perspectives of reflection).

This perspective is especially supported by authors such as David Boud (his concept of *productive reflection*; Boud et al., 2006) and Joseph Raelin (his concept of *public reflection*; Raelin, 2001). The elements of Boud et al.’s concept of productive reflection are particularly relevant in this case (pp. 19 - 23):

1. An organizational rather than an individual intent and a collective rather than individual orientation
2. Reflection is necessarily contextualized within work, it connects learning and work
3. It involves multiple stakeholders and connects players
4. It has a generative rather than instrumental focus
5. It has a developmental character
6. Reflection is an open, unpredictable process, it is dynamic and changes over time

Similarly, Raelin (2001) argues that it is “*public* [emphasis added] reflection that is the key to unlocking the learning from project-based learning ... and that can enhance learning beyond the project (team) level to other levels of experience-individual, organization, and society” (p. 12). For Raelin, public reflection refers to reflecting with others through learning dialogues to surface “social, political, and emotional data that arise from direct experience with one another” (p.12), in order to improve practice while simultaneously create mutual caring relationships. Although the idea of dialogue from Senge (1995), or more accurately the Bohmian idea of dialogue fits within the elements of productive reflection by Boud et al. (2006), there are some tension with the conventional idea of “productive”. In the workplace, productivity is often conflated with the idea of efficiency and efficacy, i.e. how much can one produce in a set time amount of time? In other words, how efficiently and effectively can we solve a problem or make a decision? This requires having a goal-oriented approach to the meeting (more in line with discussion), than a “free and creative exploration” of the issue. How can such sessions be organized, if the process is open and unpredictable and does not have an instrumental focus? What should be taken into consideration?

One possibility is to explore conditions that are present in these dialogues and how it relates to the outcomes. Baker et al. (2005) provided some conditions in the form of dialectic dimensions in their concept of conversation as experiential learning. They proposed a dialectical stance on conversational learning, suggesting that “conversation is a meaning-making process whereby understanding is achieved through the interplay of opposites and contradictions” (p. 415). Although they clarify their use of conversation vs. dialogue in their paper (p. 414), their concept of conversation fits within the Bohmian concept of dialogue used by Senge (1994), in that both emphasize the importance of inquiry and exploration, compared to debate and discussion that aims to determine which argument is correct. For that reason, I will treat the concept of conversation from Baker et al. as similar to the concept of dialogue from Senge and use both interchangeably in this thesis. From the perspective of Baker et al., the conversation space must balance the five dialectics of conversation to enable learning: Apprehension vs. Comprehension, Reflection vs. Action, Epistemological Discourse vs. Ontological Recourse, Individuality vs. Relationality, Status vs. Solidarity. Otherwise, they suggest that unbalanced extremes in a conversation will lead to undesirable outcomes. A summary of these dialectic dimensions is provided in Figure 5 below.

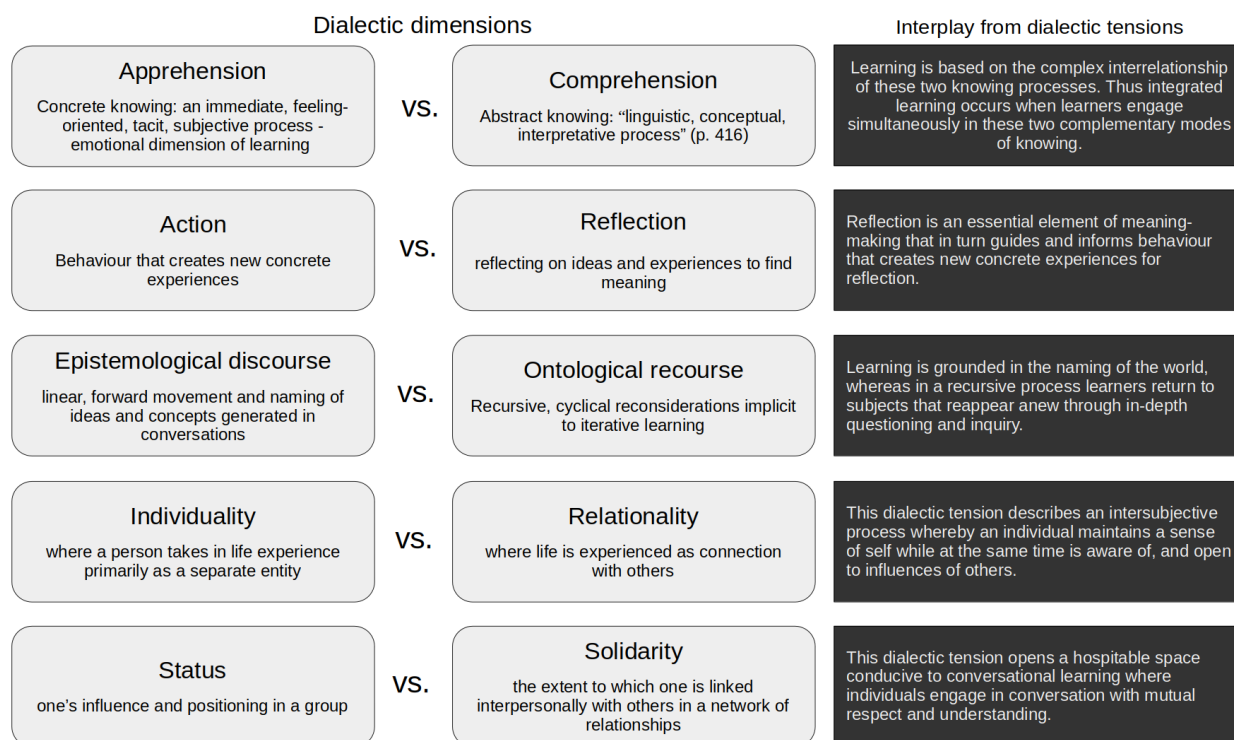


Figure 5: Overview of Dialectic Dimensions of Conversation as Experiential Learning (Baker et al., 2005, pp. 414-425)

In addition, Raelin (2001) proposed certain skills that are required for his concept of *public reflection* as a means to learning. He named these skills *Being*, *Speaking*, *Disclosing*, *Testing* and *Probing*. This is further described in the table below, adapted from Raelin (2001, p. 15):

Table 5: Descriptions of Raelin's Social Reflective Skills

Skill	Definition
Being	Creates a climate for reflection in the group. It asks that we experience or describe situations, even our own involvement in them, without imputing meaning
Speaking	Calls for speaking with a collective voice to find collective meaning in the group. It attempts to characterize the state of the group at a given time.
Disclosing	Asks that members find and speak with their own voice in order to disclose their own doubts and assumptions as well as voice their impatience and passion.
Testing	Makes an open-ended query to the group to attempt to uncover new ways of thinking and behaving. It asks the group to consider its own process, including its norms, roles and past actions
Probing	Inquires directly with a group member to understand the facts, reasons, assumptions, inferences, and possible consequences of a given suggestion or action. It commits to a non-judgmental consideration of another's views.

Note: This is adapted from Raelin (2001, p. 15)

All of this suggests that individuals need to exhibit certain skills, and that teams need to practice together, in order to create the conversational space balancing the five dialectic dimensions. Teams also need to move consciously between dialogue and discussion in order to learn from social reflection. This is especially important to enable shared interpretation of experiences as part of the experiential learning cycle, part of shared meaning-making and construction of knowledge (abstract conceptualization) in order to gain congruence for further action (active experimentation). However, in order to learn new ways of thinking or new ways of doing (taking an innovative approach and not just solving a known problem in a known way), critical reflection is important to challenge the beliefs underlying current practices in order to change them. Mezirow (1990) refers to this as premise reflection, which corresponds to the idea of triple-loop learning by Argyris and Schön (1978). If integrating has successfully occurred in a way that supports transformative learning, then project teams may be able to further institutionalize these into the organization, leading to organizational learning towards transformation.

Analytical framework: Group reflection sessions as a social reflective practice for organizational change through project-based learning

In this section, I provided an overview of the literature relevant to the studying of the phenomenon of learning-by-doing approaches within projects in the municipal administration. First, I clarified the conceptualization of learning and reflection for organizational change, which requires more than just the “absorption” of knowledge from an external source (e.g., employees reading books on forms of governance). Instead, a reflective engagement with their work is necessary, that is, learning as a process of reflecting on one’s ways of thinking and working. In order for individual learning to lead to organizational learning, projects act as both a space for increasing individual learning through the project and for integrating team learning, thus embedding it into the organizational context. In particular, in order to effectively learn new forms of working (agile approach, etc.) while *doing* them, experiential learning theory suggests that four elements of concrete experience, reflective observation, abstract conceptualization and active experimentation are necessary. This then allows for transformation of experience into learning through the continuous learning spiral. This understanding of learning-by-doing in project teams for organizational change highlights the importance of social reflective practices. These practices can help facilitate individual and group learning, ultimately enabling organizational learning. For the purpose of the intervention in this study, group reflection sessions can thus be organized to allow for dialogue and public reflection as a means of transforming their experiences into project learning.

This conceptual understanding and the relations between the concepts are summarized in the table below.

Table 6: Conceptual Understanding and Relations between Concepts

Concepts	How it relates to other concepts
Organizational learning	Changing governance approach of municipal administration <i>requires</i> organizational learning that includes the characteristics of <i>learning as a social process, the role of reflecting on underlying assumptions and system-thinking</i> .
Team learning	Team learning acts as mediator between individual and organizational learning: Organizational learning occurs through institutionalizing team learning <i>as a result of integrating</i> at the team level of individual interpretation.
Project-based learning	Projects <i>provide</i> a generative learning space for experiential learning in the team by generation of experiences and space to learn.
Experiential learning	Learning-by-doing, more specifically learning from the experiences gained from doing (experiential learning) <i>requires</i> the transformation of experience through <i>reflective observation, abstract conceptualization and active experimentation</i> .
Social reflective practice	Social reflective practice can act as a <i>means</i> to transform team experience through shared meaning-making (<i>integration of individual interpretations towards congruence</i>) <i>for future active experimentation (for the next cycle of learning in the spiral)</i> .
Group reflection session	Reflecting in a group (group reflection sessions) requires certain process conditions (<i>participant skills, conversational dimensions</i>), in order to create the dialogue space necessary to achieve the transformational learning potential of a social reflective practice .

Based on this understanding, two implications become apparent. First, “learning-by-doing” is maybe misrepresentative of what is required for project-based learning for strategic renewal in municipal administrations. Even for the individual, simply gaining experience from having done something once or repeating an action (“doing”) does not necessarily lead to learning. As Kolb’s ELT (2015) indicates, reflective observation, abstract conceptualization and then subsequent active experimentation is what is required in order to really learn from an experience, leading to the next cycle of learning which continues onto an on-going spiral. However, especially at the project team or group level, the missing link is often the interpretation and integration, in order to achieve Senge’s (1994) concept of team learning instead of just a collection of individual learning. Therefore, social interactions to interpret and integrate experiences of the team is necessary for team learning to happen. In these interactions, for the team to transcend mental models that are not working, it requires more than engaging in discussion (as defined by Senge) in order to challenge deeply ingrained personal or team mental models, something that typically does not happen in day-to-day project meetings and conversations. This element of team learning is an important step toward organizational learning.

Second, the assumption of knowledge management (prevalent in most workplace) as a means of organizational learning is somewhat simplistic and is probably inadequate for organizational transformation. Based on Nonaka's Theory of Organizational Knowledge Creation (1994), the knowledge management perspective views the organizational learning process as such. First, individuals in projects learn by doing (prototyping, testing out new methods of working, etc.), then they "transfer or share" this tacit knowledge with other participants through *externalization*, who "receive or absorb" this information to "learn" it, thereby leading to organizational learning when these ideas have been shared widely enough within the organization. This implies a *knowledge as a stock* perspective (e.g., if we increase our "stock" of knowledge, then we will perform better), which obscures the complexities of the process of organizational learning, especially the kind necessary for organizational transformation. On the other hand, the understanding of learning as a process of meaning-making (through social interactions) indicate that it is a dynamic and complex process. It is a process of negotiations and is affected by the participants' and their relations (such as power relations) as well as the process itself. Therefore, as part of the action research, the intervention should aim to allow for shared meaning-making as opposed to a simplistic collection of lessons learned, ideally in a way that elicits group reflections on a deeper level (challenging assumptions and beliefs that led to behaviours that caused undesired outcomes).

Given this understanding, the research objectives and central research questions (summarized below) can be further operationalized into the following supporting research questions, based on the phases of action-oriented research (Plan, Act, Observe, Reflect). This is presented in Table 7 below.

The Reflect phase does not have supporting research questions per se, but will be presented as Section 5: Overall Discussion section of the thesis. In that section, the findings from the study will be analysed as a whole to reflect broadly on how they address the central research questions and consequently to what extent the study meets the research objectives. In addition, Section 5 reflects on the limitations of the study and its implications on the findings, and on the future research opportunities to build on these findings.

In summary, this literature review and analytical framework addresses the research question RQ1.1: How can learning-by-doing in project teams for organizational change be conceptualized? Next, I describe the case study context and the research design in the Methodology section. After which, the rest of the thesis describes the research based on the four phases of the action research cycle. The first part of the research (Plan) addresses the population and knowledge research gaps by empirically studying the learning process of the project team. Specifically, an understanding is gained about the conceptualization of learning by the team and their perception of the conditions for enabling learning through prototyping in project teams. I then compare this against the characteristics necessary for organizational change described here. The second part of the research phase (Act) delves deeper into the challenges through an intervention by exploring the supporting research question "What types of challenges arise in the design and implementation of a social reflective process within the project?". The Observe phase deepens this exploration of the role of social reflection session by observing the outcome from the intervention. Finally, the Reflect phase is formulated as the Overall Discussion section, where I consider the findings as a whole in relation to the central research questions and consider to what extent the research objectives were achieved.

Overarching research objectives:

- 1) To address the research gaps by exploring the potential role of learning through prototyping as a project approach in enabling organizational transformation in municipal administrations, and
- 2) To explore the challenges of learning from such approaches and what can be potentially done to improve the learning process.

Central research questions:

1. What role can learning-by-prototyping project approaches play in enabling organizational transformation in municipal administrations?
2. What can be challenges of learning through such approaches for the project team?
3. What role can group reflection sessions play in enhancing the learning process of such approaches?

Table 7: Analytical Framework with Supporting Research Questions

Phase	Action and research objective by phase	Supporting research questions
Plan	<p><i>Action objective:</i> To identify an intervention that can be executed during the thesis research project</p> <p><i>Research objective:</i> To gain an understanding of the case study context through exploring the conceptualizations of learning from prototyping (primarily addressing RQ1) and factors that are perceived as important in learning from such approaches in a project teams (primarily addressing RQ2)</p>	<ul style="list-style-type: none"> • RQ 1.1: How can the role of learning-by-doing project approaches in enabling municipal organizational transformation be conceptualized? (Literature review) • RQ 1.2: How do the participants conceptualize their learning process through prototyping? (Empirical) • RQ 2.1: What factors do participants perceive as important for incorporating learning during the prototypical phase? (Empirical)
Act	<p><i>Action objective:</i> To test out a social reflective practice by implementing a group reflection session as an intervention</p> <p><i>Research objective:</i> To explore the challenges of conducting group reflection sessions (primarily addressing RQ2)</p>	<ul style="list-style-type: none"> • RQ 2.2: What types of challenges arise in the design and implementation of a social reflective practice within the project? (Empirical)
Observe	<p><i>Action objective:</i> To observe the potential of the intervention in improving the learning process</p> <p><i>Research objective:</i> To explore the role that group reflection sessions can play in enabling learning (primarily addressing RQ3)</p>	<ul style="list-style-type: none"> • RQ3.1: What types of learning can be observed through the implementation of the social reflective practice? (Empirical)

Reflections on the literature review and analytical framework

This section was the most challenging to me throughout my thesis, and each attempt to write it led to a significantly different outcome, most often in my doubting the coherence of my methodology and findings. Although not unique to action-oriented or interpretivist research approaches, these challenges are especially difficult in these approaches (Dick, 1993; Fisher & Phelps, 2006; Zuber-Skerritt & Fletcher, 2007)

I struggled in particular with the challenge of deciding the relevance of theories and what to keep vs. discard and the challenge of estimating comprehensiveness (did I miss any key literature?). Beyond the lack of familiarity with the field and insufficient skills in conducting literature review, the evolving nature of an action-oriented, interpretivist research approach resulted in me prematurely discarding literature I later find to be relevant (e.g., re-discovering Senge's "The Fifth Discipline" while planing the interventions in August), missing key theories within the field (e.g., noticing Crossan et al.'s 4I model in July), or knowing about relevant theories in other fields (e.g., discovering Kolb's ELT in July). The first challenge contributes to a sense of disconnect between the concepts: What are the relations between them? What is the golden thread in this eclectic mix? This is what I assume Zuber-Skerritt and Fletcher (2007) meant when they mentioned the challenge of using theories "cautiously" and not "recklessly". The second challenge led to inadequate exploration of certain relevant aspects, due to the research re-design that would no longer be possible. For example, if I had found the 4I model earlier and considered it a key theory, could I have focused my study more on exploring the different subprocesses that can be observed within the project team and their relations to each other? Despite my attempts to learn more about research skills to mitigate these issues, I could not apply the advice of many resources. Some advice is too general and not specific to my research strategy (e.g., Flick, 2022; Grant & Osanloo, 2014). Even finding resources that are more specific to my research approach, I found I was not capable of applying the skills or methods mentioned (see e.g. Bradbury, 2015; Craig, 2009; Freeth & Vilsmaier, 2020; J. M. Wittmayer & Schöpke, 2014). On the other hand, whether it was the content or the method of the research, through the literature review and engagement with the research process, I became highly aware of my *own* learning process, including noticing (through reflection) some discrepancies between my espoused theories and my theories-in-use, especially regarding the underlying perspective of knowledge and learning, see Appendix A2: Reflection on literature review process for more info. Despite espousing a position more aligned with the social-process perspective as described by Chiva and Alegre (2005), I did not question the ideas underpinned by the cognitive-possession perspective, suggesting that both perspectives (still do) coexist in my conceptual understanding.

My concept of learning and reflection also does not necessarily reflect the ideas of the project team members. In addition, I recognize that my conceptualization is heavily loaded with normativity. This does not mean that I discount learnings that the team recognizes, such as learning how to use a new software for the project. Hence, I found it necessary to explore their conceptualizations with the analytical categories from Armitage et al. (2008) instead of based on this normative conceptualization. For the purpose of my thesis, I believe this can still be a productive approach because the analytical approach provides insights on how the learning process through prototyping work and their perceptions of it, whereas the more normative approach provides an evaluative basis to consider what type of learning would be necessary to achieve the organizational change in municipal administrations necessary to steer towards a more sustainable future.

Overall, these challenges led to a less coherent end product than what is probably expected for a thesis.

Section 3 - Methodology

Introduction to the methodology section: Goals, process, structure

This section starts with a brief clarification of the research methodology, followed by a description of the case study, the research design including data collection and analysis methods, and finally a critical reflection on the methodology. As mentioned in the introduction, this is an exploratory research as currently there is insufficient research regarding the experiential learning (learning-by-doing) process of project teams engaging in prototyping within municipal administrations. The study includes elements of action research as a research strategy to study the phenomenon close to practice and with the purpose of informing practice.

Research strategy: Incorporating elements of transdisciplinary and action-oriented research approach

The rationale for action research in this study has been briefly outlined in the introduction. I will expand upon that here. Action research as a research approach has been used in education sciences (e.g., Craig, 2009), management studies (e.g., Zuber-Skerritt & Perry, 2002), healthcare (e.g., Bradbury, 2015), and recently in sustainability sciences, particularly under the term transdisciplinary action-oriented research (e.g., Bradbury et al., 2019; Fazey et al., 2018). One of the key criticisms of action research towards “traditional approaches” to science is that “traditional scientific method” is too distant from practice (Bradbury et al., 2019; Zuber-Skerritt & Perry, 2002). However, critics of action research claim that it is not rigorous (as described in, e.g., Dick, 1993; Zuber-Skerritt & Fletcher, 2007 for an overview of the criticisms). In response, some scholars have identified new ways of assessing action research beyond the positivistic understanding of validity and replicability (see, e.g., Dick, 1993; Fazey et al., 2018; Zuber-Skerritt & Fletcher, 2007). However, it is impossible to fulfil all of these criteria within the time and skill constraints of my master’s thesis research. As such, I view these as principles guiding my process, or the goals towards which I strive, but with certain adjustments because of the limitations. What follows are the ways in which I attempted to incorporate the tenets of action research into the study:

Table 8: Requirements for Action Research and Attempts to Address Them

Requirement for action research taken from Zuber-Skerritt and Perry (2007, pp. 417–418)	My attempt to incorporate this element
Practice-oriented (improving practice)	(Action) focus on improving the learning process within the project team
Participative (including in their research all stakeholders and others who will be affected by the results of the research)	Partial participation of members involved in the prototypical phase (contingent on project management recommendations and participants’ availability)

Requirement for action research taken from Zuber-Skerritt and Perry (2007, pp. 417–418)	My attempt to incorporate this element
Focused on significant issues relevant not only to themselves but also to their community/organisation or fellow human beings in the wider world	As described in the social relevance section of the introduction (p. 8) and the research purpose (p. 13), the research aimed to better understand the challenges and potentials to improve organizational learning within municipal administrations, hopefully increasing their capacity to address the complex socio-ecological issues through more adaptive governance approaches
Using multiple perspectives of knowing, triangulation of appropriate methods and theories, and connecting their own judgements to discussion in the current literature	Used a mix of observation (participant observation in daily work, group discussions and interviews) and intervention (conducting group reflection sessions). Based on theories in experiential and organizational learning in order to gain a deeper understanding of the challenges hindering learning
Rigour in their action research methodology. Creative, innovative, contributing something new to knowledge in theory and practice within and across systems	Unable to incorporate “rigour in methodology” but attempted to be systematic within the constraints. Aimed to contribute to knowledge by addressing the identified research gaps (not across systems) and contribute to practice within the project team
Explicit about their assumptions so that readers and examiners may use appropriate criteria for judging the quality of their work	Assumptions are made explicit where possible, e.g., in the theoretical perspective of knowledge (social constructivism), epistemology (interpretivism), etc.
Reflective, critical, self-critical and ethical	Reflections on the research were documented throughout the process and incorporated within the thesis

Although action research as a research approach is challenging (Dick, 1993), I chose this strategy because I believe it is a better one to address the practical-knowledge gap as outlined in the introduction, which is one that I find to be personally most important to resolve. In addition, this is in line with my belief that the purpose of knowledge is to improve practice (a utilitarian perspective), as well as my belief echoing Kurt Lewin, “you cannot understand a system until you try to change it” (Schein, 1995, p. 12). However, the pitfalls of having selected this approach and the challenges in navigating it is briefly mentioned in the reflection section of this section and throughout the thesis.

This approach is also well-suited to the case study that I had access to (as covered under “Positionality: My role in and relation to the project team” in this section later), which is the DATEN:RAUM:FREIBURG project. This is because of the openness of the participants (in particular, from the project management) to engage in the topic and in this approach. I will now briefly describe the case study context, followed by its relevance for this research purpose.

Case study: DATEN:RAUM:FREIBURG project

Setting the stage: Situating the project within the Smart City discourse

The topics of Digitalization and Smart City have become more popular in recent decades globally. With respect to sustainability, this discourse is often embedded in the ecological modernization world-view (see

Dryzek, 2017, Chapter 8 for a description of ecological modernization), where digitalization is seen as a means to achieve a more efficient, sustainable future (see, e.g., Ahvenniemi et al., 2017; Bibri & Krogstie, 2017). Many ideas of the technological and business world have diffused into other areas of society. For example, many municipal administrations are engaging in concepts from the software development world such as being more agile to become more innovative to “break free” of bureaucratic rigidity⁴ (see, e.g., Eggers et al., 2021 for an example of such discourse). However, Germany is often seen as lagging behind other industrialized nations in terms of digitalization (Wenkel, 2017). To address this, there has been a push from the German federal government to increase the speed of digitalization and innovation (Digitalisierung, n.d.). Within the German context, digitalization is seen as a means to improve efficiency but also to increase agility, both in order to increase governance capacity of the public sector to serve the needs of people (see, e.g., Digitaler Aufbruch und moderne Verwaltung, n.d. for an example of such discourse). Naturally, there are critiques of these discourses, such as those problematizing the positivistic concepts of Smart City as a way of perpetuating power imbalances, etc. (see, e.g., Kitchin et al., 2015; van Oers et al., 2020). However, on the whole, there is a tendency towards optimism in academia and in the field about the idea of the Smart City as a new form of governance or to support better governance approaches⁵ (see, e.g., Alawadhi et al., 2012; Estevez et al., 2021). In fact, the concept of “Smart Sustainable City” has now emerged to address the critique of the techno-centrism of the Smart City concept (technology as an end in itself) by trying to focus it on the concept of “smart” as a means to the ends of “sustainable” (see, e.g., Ahvenniemi et al., 2017; Alagirisamy & Ramesh, 2022; Bibri & Krogstie, 2017, 2019). These includes claims that these technologically supported governance approaches would allow for more evidence-based decision-making for sustainability issues (often conflated with the idea that these decisions will thus be more accurate) or more participation through the availability and access provided by digital platforms, among other promises such as more efficiency and efficacy (see, e.g., Meijer & Bolívar, 2016). Delving into this debate is out of the scope of this study. However, this brief look at the concept of “agility” and “flexibility” in governance by municipal administration (as envisioned in the Smart City discourse) does raise the question to what extent it relates to the concept of “good governance” from the literature (see, e.g., Luederitz et al., 2017); (Ansell & Geyer, 2016). For example, whether the importance of reflection and learning often emphasized within the urban sustainability transition literature is conceptually comparable with those of the “agile governance” discourse. This background discourse and context should be considered in the understanding of the case study described below.

Freiburg Smart City Model Project: From Connected Urban Data Infrastructure to DATEN:RAUM:FREIBURG

In 2019, the Municipal Administration of Freiburg applied for and was accepted into the Smart Cities Model Projects initiative by Germany’s Federal Ministry for Housing, Urban Development and Building (Fritz, 2020). This initiative was launched in 2019; its goal was to select and support model projects that will “test and implement practical solutions for sustainable and community-oriented urban and municipal development

4 This can also be illustrated in this quote, whereby the ideas of “start-up mentality” is now gaining traction in the Municipal Administration of Freiburg: “This may ring of a certain US start-up mentality, but in Freiburg it comes from a need to break free from traditional and time-hardened patterns because they are a bad fit.” (Bechtel, n.d.)

5 It should be noted, anecdotally, that I observe a higher-level of skepticism towards these promises in the German cultural context than in other contexts such as in the United States of America or in Malaysia

in the age of digitalization”⁶ (“Modellprojekte Archives,” n.d.). The initiative had three rounds of applications and currently 73 cities are taking part.

The municipal administration of Freiburg joined in the second round with an application to develop a Connected Urban Data Infrastructure (abbreviated as CUDA). This was later renamed to DATEN:RAUM:FREIBURG (hereafter referred to as DRF). The goal of the project is to develop a technological solution, a so-called System of Systems or central data infrastructure that can integrate data from a wide variety of sources, perform data processing and data analysis, and facilitate the implementation of numerous applications (Smart-City-Modellprojekt startet in Entwicklungsphase, n.d.). Although this is often referred to as the Smart City project (also known as such internally), project members admit that this naming is due to the funding from the Smart City Model Project initiative and should be seen as one of the initiatives towards a “Smart City”, not THE Smart City project. In fact, the Municipal Administration of Freiburg does not have a Smart City strategy, although this project is seen as a Key Measure (*Basismaßnahmen*) of the Digital Strategy (Digital Strategy Freiburg, n.d.). The development of the Digital Strategy was spearheaded by the Digital and IT (DIGIT) department in Division I (Dezernat I) which reports directly to the head mayor Martin Horn. This new department resulted from the restructuring to place more focus on digitalization, given that one of Mayor Horn’s campaign objectives was to accelerate digitalization in Freiburg (“Freiburg wird digital,” 2018). However, the idea for this project is not new. Project members recall that this project idea evolved from the ambition for Open Government (German Federal Government, n.d.), which then evolved into the discourse of Open Linked Data, to support more transparency in governance. This shows that this is not the administration’s first attempt to address the issue of effective data usage for “good governance”. Although the Municipal Administration of Freiburg provides several open data portals (FRITZ and FreiGIS⁷), these platforms lack the connectivity and interoperability to enable the evidence-based decision-making, which is seen as necessary for the municipal administration to govern and handle the complexity of the challenges facing them.

Brief overview of the DATEN:RAUM:FREIBURG project

“Your data. Your city.” (“*Deine Daten. Deine Stadt*”) – this is the motto of the DATEN:RAUM:FREIBURG project, which aims to become the “digital keys to (the city of Freiburg)” (der digitale Schlüssel zu unserer Stadt). As mentioned above, the project’s goal is to establish a connected urban data infrastructure, a data hub that will allow for the better integration of data so that urban data can be better shared, made available (including to the public) and used for multiple use cases⁸. The project kicked off in 2021 and will be funded through to the end of 2025. The project team is structured into the following work streams (*Teilprojekt*): a) Platform Architecture, b) Data Governance Systems, and Knowledge, c) City Simulation, d) Mobility, and e) Connected Participation. The first two work streams (Platform Architecture and Data Governance) are responsible for the technical aspects of the technological solution and the following two (City Simulation and

6 The English website did not contain this information. The original German quote is “Ziel der Modellprojekte ist es, im Zeitalter der Digitalisierung praxisnahe Lösungsansätze zur Gestaltung einer nachhaltigen und gemeinwohlorientierten Stadt- und Kommunalentwicklung zu erproben und umzusetzen.”

7 The former for statistical information (<https://fritz.freiburg.de/Informationsportal/#app/startpage>) and the latter for GeoInformation (<https://geoportal.freiburg.de/freigis/>)

8 “Das Smart City Projekt DATEN:RAUM:FREIBURG verfolgt das Ziel, einen Datenraum aufzubauen, der hilft, Daten besser zu integrieren, damit städtische Daten besser ausgetauscht, zur Verfügung gestellt (auch der Öffentlichkeit) und für neue Anwendungsfälle wiederverwendet werden können.” (Projektbeschreibung Allgemein, Internal document, Confluence, 5 Nov 2022, own translation)

Mobility) are responsible for the use cases (the functional aspects). The last work stream (Connected Participation) is responsible for engaging with external actors (communication and participation) and developing use cases for increasing participatory governance through the data infrastructure. In addition, there is an unofficial work stream for Project Management (Projektleitung) that oversees the coordination and management of the project. This project management group is composed entirely of members within DIGIT (most of whom also belonged to the digital.freiburg team). The digital.freiburg team is the group in charge of coordinating and implementing the Digital Strategy of Freiburg and consider themselves as the innovative frontrunner within the municipal administration, with focuses on innovative approaches such as Public Service Design (see Public Service Lab Week 2020, n.d. for more information) as new ways of working as well as new ways of understanding the role of the municipal administration. In essence, they see themselves as trying to change the governance approach and culture of the administration towards being more flexible and adaptable to the demands of the 21st century. As opposed to most teams in the administration, they have a flat hierarchy within the team in that they have no team lead and instead, they are all peers with their own speciality and focus, who each report directly to the Department Head, Bernd Mutter. The main speciality and focus of the project lead and deputy project lead is currently on the implementation of the DRF project.

DATEN:RAUM:FREIBURG is a cross-departmental project with approximately⁹ 30 project members involved, coming from eleven different departments and almost all the divisions (other than Division II). Project members have different percentages of their time allocated to the project, and most are not working full-time on the project. The table below summarizes the departments involved in each work stream. Please note that this is based on the employees who were listed as part of the work stream (which department they belong to), which does not necessarily mean that the department themselves play a significant role in the project (e.g., that the project is a priority within the department, etc.)

Table 9: Project Structure: Work Streams and Departments of Project Members

Work stream	Department of work stream leads ¹⁰	Other department involved	Division involved
Connected Participation	<ul style="list-style-type: none"> Office for Project Development and Urban Renewal 	<ul style="list-style-type: none"> Digital and IT Urban Planning Office Office of the First Mayor von Kirchbach 	<ul style="list-style-type: none"> Division V Division III Division I
Platform Architecture	<ul style="list-style-type: none"> Digital and IT 	<ul style="list-style-type: none"> Office of Citizen Services and Information Management Office for Project Development and Urban Renewal 	<ul style="list-style-type: none"> Division I Division IV Division V

⁹ Due to the fluid nature of the project, this number fluctuates and there is no proper documentation of who is actually working on the project in what capacity

¹⁰ I could not find the official department names in English so these are my own translations. For the original German names, please see Appendix: Appendix B: Further Information for Section 3 - Methodology, p. 128.

Work stream	Department of work stream leads	Other department involved	Division involved
Data Governance Systems and Knowledge	<ul style="list-style-type: none"> Co-lead: Office of Citizen Services and Information Management Co-lead: Office for Project Development and Urban Renewal 	<ul style="list-style-type: none"> Urban Planning Office Legal Office Digital and IT Surveying Office Main and Personnel Office 	<ul style="list-style-type: none"> Division IV Division V Division I
Mobility	<ul style="list-style-type: none"> Digital and IT 	<ul style="list-style-type: none"> Office for Project Development and Urban Renewal Surveying Office Garden and Civil Engineering Office 	<ul style="list-style-type: none"> Division I Division V
City Simulation	<ul style="list-style-type: none"> Surveying Office 	<ul style="list-style-type: none"> Office for Real Estate and Housing Dietenbach Project Group Urban Planning Office Digital and IT Office for Project Development and Urban Renewal 	<ul style="list-style-type: none"> Division V Division I

There are also additional stakeholders or other parties that have specific involvement, such as the Procurement Office (*Vergabemanagement*) from Division I who consulted with the project on the bidding and tender process. According to project participants, this level of cooperation between these many departments and divisions for one project is uncommon for the Municipal Administration of Freiburg.

As part of the application and funding process of the Smart City Model Projects Initiative, the German Federal Ministry for Housing, Urban Development and Building included certain requirements, such as the requirement to use Open Source technology and including the requirement for the cities to provide at least 30% of their own capital (for a full list of requirements, see KfW (Kreditanstalt für Wiederaufbau), 2021). For DRF, the total funding amounts to 12.8 Million Euros (Stadt Freiburg im Breisgau, n.d.). Another requirement is that the funding recipients must engage in “innovative ways of collaboration within the organisation and with external actors” (KfW (Kreditanstalt für Wiederaufbau), 2021, p. 7). In line with that, project management included in the application the plan to use an “agile” approach to working, specifically agile project management. “Agile “is a concept that has become a buzzword in the software development industry and has now diffused into other settings. The Project Management Institute defines it as “an iterative approach to work that helps teams deliver value faster and with fewer headaches. Instead of betting everything on a big launch, agile teams deliver work in small, consumable increments” (Project Management Institute, n.d.). In the context of software development, that can be very helpful, as it reduces the possibility that a firm spends a lot of time and money programming a product that the client is not satisfied with in the end. For example, due to the discrepancies in the understanding of the product between the developer and the

client, or clients not really knowing what they want until they have something tangible to test with, or the programmer's anticipations of the context in which the product would be used (the client's situation) differing from reality. A key part of the iterative approach includes the idea of learning-by-doing, where the developers and clients learn more about what solution is necessary as they go through iterative cycles of testing and adjustment. In DRF, the project team incorporated an explicit prototypical phase to the five-year project to enable learning-by-doing (Smart-City-Modellprojekt startet in Entwicklungsphase, n.d.). The project first contracted two service providers in order to develop and test a prototype of the data infrastructure within six months. Specifically, this is done through the two concrete use cases that were developed that are seen as potential applications that the data infrastructure should be able to support in the future. The aim of this approach is to obtain insights and "lessons learned" that can then inform the development of the end product, so that the chances of making a major, irreversible mistake is reduced by having continuous small adjustments along the way (Smart-City-Modellprojekt startet in Entwicklungsphase, n.d.). Within the project itself, agile project management methods are also introduced as ways of structuring and organizing the project.

Brief overview of learning in the project

Learning is seen as a key element of the project. For example, the idea of "learning-by-doing" is often used in the project, especially with regards to the goal of the prototyping phase. This can be seen in most publications about the project, such as here in a publication by one of the service providers contracted for the prototypes: "Before the smart city project eventually goes live, a continued *willingness to learn* and optimise the project with *growing experience along the way* is a priority." (emphasis in italics added) (Bechtle, n.d.). On a high-level, the prototyping phase is seen as a way for the project team to *learn* more about their own requirements for the technologies and software architectures that are necessary in order to fulfil the perceived ambitious goals of DRF. This approach was chosen for the following reasons (Stadt Freiburg im Breisgau, n.d.-b, own translation):

- To avoid making premature decisions on platform technologies and architectures
- To test the interaction of the new platform architectures with the existing system landscapes on the basis of the use cases
- To learn how data governance specifications for concrete functions/services can be implemented in a sustainable and verifiable manner
- To further specify the initially general requirements iteratively

In particular, this prototypical phase is seen as necessary because the project team needs to communicate these requirements clearly in the bidding and tender process to the potential contractors. This communicative learning is important to reduce (to the extent possible) misunderstandings between the two parties that could cause issues with project budget and timeline or unsatisfactory end product. The possibility of misunderstanding is perceived as high in this case because 1) there are no existing market solutions out there that corresponds to the vision that the project team (and municipal management) has in mind, 2) the project team and stakeholders started with varied and vague ideas of what this solution should look like, 3) the technologies in this field is changing and evolving relatively rapidly, 4) the solution has to be customised to work exactly within the current context of systems, which no one group has full knowledge and understanding of (because of the institutional structure and size). Thus, two use cases were developed and

selected to be part of the prototyping phase in order to identify the requirements for the system iteratively: a digital marketing platform for urban properties and an overview of mobility data in Freiburg. The project team defines use case as “a description of the functionalities of a system and how the user operates the system” (Stadt Freiburg im Breisgau, n.d.-a, own translation). They serve as concrete examples to uncover potential problems at an early stage and ensure that no decisions are made prematurely about platform technologies and architecture (Smart-City-Modellprojekt startet in Entwicklungsphase, n.d.). Thus, learning-by-doing in the case of learning-by-prototyping refers to an iterative project approach that allows for frequent adjustment based on trial-and-error, especially because of factors such as “unknown unknowns”, i.e. things we did not know that we did not know. Even within the six months of prototyping, the iterative approach is used as the development was conducted in three phases: interim goal 1, interim goal 2 and completion. Besides regular contact with both external contractors, the project team had to approve what the contractors deliver at the end of each phase and provide feedback so that the contractors can adjust the prototypes accordingly, and differences between expectations can be resolved.

Besides this overall learning-based approach through prototyping, the project also includes learning-by-doing in many of the ways the project is managed. For example, the project introduced many new ways of working (new to the municipal administration), such as the use of new digital tools, new project management method (agile method), new process Pre-Commercial Procurement (PCP) of bidding and tender introduced by the EU for innovative solutions (Pre-Commercial Procurement | Shaping Europe’s Digital Future, n.d.), new project monitoring and evaluation method (OKR - Objectives and Key Results), etc. Although learning new ways to work within projects may not be unique to this project, what is uncommon as perceived by the participants are the sheer number of new tools, methods, etc. that project members need to learn and ideally master at the same time. Thus, learning-by-doing here is partly out of necessity (and not just belief) as learning has to be done “on the job” / on-the-go as it would not be possible to master these skills in an alternative setting before applying them. Many of these new ways of working also require a change in mindset (a paradigm change might be too generous a term) in how work should be done. For example, the use of a digital knowledge management tool / platform (Confluence), mostly as a wiki and for collaborative document-editing, requires project members to change from a way of working that is more individual into a more collaborative approach through the ease of collaborating on drafting and contributing to a document at the same time. More generally, the highly touted agile approach of the project requires not just a change in way of working (from slow, deliberative and careful to fast, less structured and flexible) but also a change of what is viewed as “good work”. This means, for instance, that it would be considered desirable to “fail fast and fail often” than to work carefully to avoid making mistakes.

Furthermore, elements of organizational learning (in the sense of knowledge transfer and capacity building) is embedded in the project through the project contract (Projektauftrag) defined by the project management to the work streams. For example, the Connected Participation work stream is given the responsibility for knowledge transfer, only described broadly: “Knowledge transfer and capacity building in the municipal administration¹¹” with the key result being “Development of the Smart City Training Program”¹² (Stadt Freiburg im Breisgau, n.d.-c, own translation). On the other hand, the Data Governance, Systems and Knowledge work stream is given the task of “capacity building”. This is referring to planning and

11 Original quote in German: “Wissenstransfer und Kompetenzaufbau in der Verwaltung”

12 Original quote in German: “Konzept Fortbildung Smart City erarbeiten”

coordinating training and capacity-building programs within the municipal administration in order for employees in the organization to learn how to manage data and, in some cases, become “Data Stewards” (Stadt Freiburg im Breisgau, n.d.-d, own translation). Both tasks show that learning from the project is not limited to the project but also to include engaging in learning within the organization. However, it should be noted that during the prototyping phase, not much progress was made on these tasks (mostly because of personnel shortages), as well as the belief that it is still premature to engage the rest of the organization so early in the project. For example, while the data infrastructure is still not yet built, it would be hard to plan what type of capacity employees would need to master (other than general knowledge of data management).

Thus, learning is viewed through multiple lens within the project. In terms of learning-by-doing, the goal of the prototyping approach is to allow the project team to learn instrumental and communicative learning. An example of the former is to learn how to solve the problem of “what technological requirements do we need to fulfil our vision of a data hub?”. The latter engages with questions such as “how do we create shared understanding with potential contractors regarding our requirements?” At the same time, learning-by-doing is seen as the method to acquire and practice new ways of working, such as in the agile project management approach (as opposed to classical project management). Additionally, the project sees itself as engaged in organizational learning through knowledge transfer (into the municipal administration and beyond), and in capacity building through creating training programs for employees to learn new skills that are seen as necessary in order for the organization to be able to handle the data effectively.

In terms of project design to facilitate learning, in addition to the prototyping phase, there is also a defined role called “agile coach”, whereby this member of the project team (not full-time) is tasked with coaching the team on working using the agile methodology. This member, as well as the project lead and deputy project lead, attended training courses in agile methodology as part of developing their skills to manage this project in the “new way of working”. In addition, the project uses digital tools, such as the afore-mentioned knowledge management platform and a tool for task management, which are seen as tools to support collaboration and learning within the project. Although this is new for most project members, it is part of the plan of the municipal administration to implement this tool organization-wide. Here, again, the project is seen as a means to facilitate the organizational change within the administration through learning from and sharing the experiences that project members gained from using these tools. Thus, besides the intention to learn as part of the project plan (demonstrated through the prototyping phase), the project includes additional elements, such as the usage of tools or the definition of a coaching role to further facilitate project-based learning. And this is seen as serving the ultimate purpose of enabling organizational learning. One note should be made on processes and structures for learning: there is a separate department whose responsibility is to manage organizational learning, and they have internally published guidelines on how to document lessons learned at the end of projects (typical of project and knowledge management literature (North & Kumta, 2018), but project participants were either unaware of these resources or did not hold them to high regard (viewed as too outdated and unsuitable for the agile approach). During the time frame of this study, no strong relationship or major interactions could be observed between the project team and this department with regards to enabling organizational learning from the project, other than potentially through personal relationships.

Although the iterative and agile approach is explicitly chosen *in order to learn*, no specific structures are put in place to focus explicitly on the learning process itself, such as by using learning plans or goals.

Nevertheless, project members reported having learned a lot through the project and through the prototyping phase, and an overview of the types of knowledge they mentioned to have learned is provided in the table below. This overview comes from my participatory observation of the project team and from the data gathered in the first workshop. Project members mentioned learning through social interactions (with each other or externally), attending training programs, attendance at conferences, etc. as sources of learning or processes of learning. Note that the table below does not provide an exhaustive list but aims to illustrate some types of learning mentioned by participants as having taken place through the project. This will be explored in more details in the Findings and Discussion section.

Table 10: *Types of Knowledge Learned as Reported by Participants*

Type of knowledge learned	Example
Content knowledge	What a data platform is, what types of standards exist, what types of technology options exist, etc.
Methodological knowledge	What the agile method is, how to work in an agile way (conceptual as well as experiential knowledge), how use cases can be developed, etc.
Knowledge and skills needed to use new (digital) tools	How certain digital tools work (e.g., Confluence/Jira/Conceptboard, etc.), how to use them, etc.
Interpersonal knowledge and skills	How to communicate and collaborate with each other (e.g., collaboration methods), how to communicate with contractors, etc.
Project management skills	How to organize and coordinate a cross-departmental project of such scale and complexity (e.g., project structures)
System knowledge – Better understanding of context	How the municipal administration works internally, e.g., official and unofficial distribution of responsibilities within the organization

Generally, the learning mentioned by the project team members tended to be at an operational level, e.g., – “how do I work with the tools and new methods introduced by the project?”. Given the amount of new tools and methods that are introduced, the learning curve is seen as very steep within the project and is seen as overwhelming for certain members. Although project management considers learning to be crucial, the project lead admitted that there has not yet been a sufficient focus on learning and that there are many open questions that have not been addressed, such as how to measure learning, how to encourage more learning, how to diffuse the knowledge from the project into the larger organization, etc. (P1, Learning context preparatory interview). This provides a brief overview of the project context as it relates to learning. Further exploration will be elaborated in the Plan phase of Section 4: Findings and Discussion.

Relevance of this context

As briefly mentioned in the introduction, this case study is relevant for research for two reasons: 1) As learning is given some level of importance in the project team, they can be view as a “critical case” (as defined by Flyvbjerg, 2006) for project-based learning. The learning challenges faced by a learning-oriented project are especially interesting because it offers insights into deeper challenges beyond lack of motivation or intention to learn. That is, if project-based learning is challenging in this case, it would be challenging to

learn generally within municipal administrations in order to achieve organizational change. Second, they can be seen as exemplifying an archetype, a project within the municipal administration that is learning to learn. This process is important to understand because of the calls for the transition to new governance modes, especially as research on how these processes take place is lacking, as highlighted in the research gaps. Even though this context is not situated directly within a sustainability transition, the goal of the project is ultimately to serve the principles of public good and sustainability, which are the underlying principles of the Digital Strategy. Thus, it is also important to understand these learning processes and how they relate to those higher-level goals.

On the other hand, by choosing a project that already places importance on learning and seeks to be different from the “classical municipal administration”, this study and its results cannot be transferable to projects that may be still operating within the logic of what might be seen as the “classical municipal administration approach” within Germany (e.g., slow, bureaucratic, etc). However, as even projects seeking to initiate change are subject to the institutional culture and existing structure of municipal administrations, this can be seen with the lens of the Transition Management perspective (Loorbach, 2010) as a study on the frontrunners and the challenges they face in navigating the landscape structures.

Positionality: My role in and relation to the project team

Here I will briefly describe my role in and relation to the project team to be transparent about my positionality. I worked as an intern in the project team from October 2021 to January 2022. Upon the completion of the internship, I continued with part-time employment within the project (on a “mini-job” basis, i.e. 6.5 hours per week) and this employment will continue until December 31, 2022. During the internship, I provided support to the Data Governance work stream, and then transitioned to provide more support in project management, especially in trying to assist with the usage of Confluence and Jira as new tools for the project team. In addition, I supported project management in various events.

This engagement provided me with some additional insight and access to the project team that I otherwise would not have had as an external researcher. For example, the idea of the research topic formulated in my mind as I noticed the puzzle in the discrepancy between the intent of the project team to learn vs. my expectation of how a learning-oriented project approach should look like. In addition, I could form a rapport with the project members and I believe my position as a “mini-jobber” potentially makes it easier for them to share their experiences more honestly with me. However, this access also brings with it the risk of being too close to the topic. Although I have tried to keep a separation or distance to the extent possible between my *employed work* and my *research*, in reality those separations are difficult to manage both for myself and for the team. In addition, some of the data are from my work as opposed to my research, which I will note accordingly to take into account the possibility of further biases. I tried to be aware of my dynamic role and positionality throughout the research process as suggested by several authors (Freeth & Vilsmaier, 2020; Wittmayer & Schöpke, 2014), such as by taking reflection notes and to reflect on how my positionality impacts the research findings. However, I found I could only engage in this superficially because my struggle in the iteration between literature and empirical data (theory and practice) took up more capacity, so that I could not and reflect on my reflection notes in detail.

Overall design

This research was structured along the four phases of action research outlined by Zuber-Skerritt and Fletcher (2007): Plan, Act, Observe, Reflect. Using a research strategy that incorporates elements of transdisciplinary and action-oriented approach, the aim of the study was to gain a deeper understanding of the experiential learning process within a project team and its potential role in enabling organizational learning in a municipal administration. Specifically, I aimed to explore the challenges in the learning process and potential ways to improve the process. However, as is expected of such a research approach, there were changes made to the overall research design based on the circumstances and my iterative learning process while conducting the research (Bai et al., 2019; Zuber-Skerritt & Fletcher, 2007). I will briefly outline this below (further relevant details have been incorporated throughout the thesis). Here I will outline it descriptively (what was planned, what changes occurred, and what was the final process). Reflections on the reasons and its implications are included in my reflections at the end of the Methodology section.

Plan vs. reality

My original research idea was to conduct an intervention-based action research commonly used in organizational and management studies. In the context of action research for thesis-writing, my process was based on the process depicted in Figure 6 by Zuber-Skerritt and Perry (2002, p. 176).

In these approaches, the researcher and participants work together in an action learning group to address a specific problem with both practice and research relevance, within what they term as the “core action research project”. These were the original cycles for this research: Plan (May), Act & Observe Cycle 1 (June - July), optional Plan, Act & Observe Cycle 2 (July – August), Reflect (August). This is then followed by the thesis write-up. See Appendix B2: Original research plan, p.129, for the original plan, as communicated in the research proposal and to the participants.



Figure 6: Relationships between Core and Action Research Projects

Note: Taken from Zuber-Skerritt and Perry (2002, p. 176)

In Figure 7 below, I adapted the cycle from Zuber-Skerritt and Perry (2002) to show the relationship between the project team and my research. This figure was shown to the project team to communicate the relations between the Plan, Act, Observe, Reflect cycle of action research and the corresponding phases within the project. Although Plan, Act, Observe, Reflect structure is not explicitly applied to the project in the participants' understanding, the parallels can be drawn because many project management approaches inherently have some elements of these stages. However, as indicated in the literature (e.g., Schindler & Eppler, 2003), projects typically lack the time to observe and evaluate the outcome of their project design and reflect on the progress of their projects, as can be observed in this case. Thus, my envisioned contribution to practice was to create this “space” to pause, observe and reflect on the learning process within the project team from the prototyping approach.

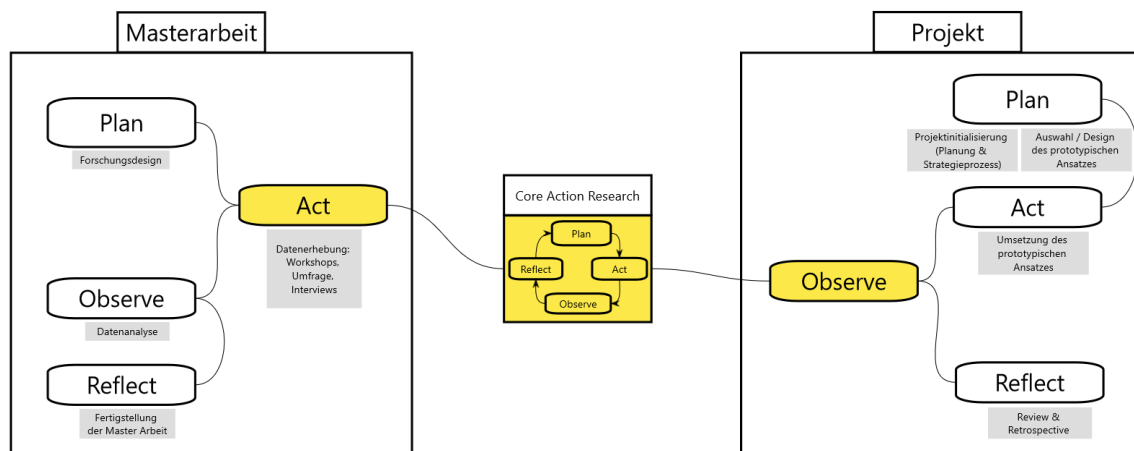


Figure 7: Relation between My Research and the Project's Phases as per Action Research Cycle

However, from the first workshop in May (the kick-off and planning workshop), several challenges arose that made it hard to conduct the research as planned. The participants did not come to an agreement on the intervention or measure that they would like to engage in. There were many ideas from the brainstorming (mostly listing different techniques of knowledge management and agile methodology), but there was no alignment on the exact next steps to be taken. There were also some unexpected personnel shortages that arose within the project, leading to a lack of moderators, participants, and consequently to some decreased capacity from project management to support the research as collaborators (vs. participating as research subjects). Considering these circumstances, I had to decide if I should schedule more time with the group to push them to select only one measure to implement or if I should change my approach. I first decided to change my research approach to remove the joint implementation of a measure, and instead switch to group discussions as a way to understand the learning process. However, the re-purposed workshop in June ended up feeling like it was not very productive for the team (for practice) nor for me (for research). Upon further reflection, I decided to go back to my original goal of introducing an intervention. But this time it was without a “participatory method” and was instead a unilateral decision on my end with only consultation with the project management. More details on the process are included in the reflection notes at the end of the Methodological section. This iterative adjustment in the research design is depicted in Figure 8 below, which was used to communicate to the participants during the August 1 workshop.

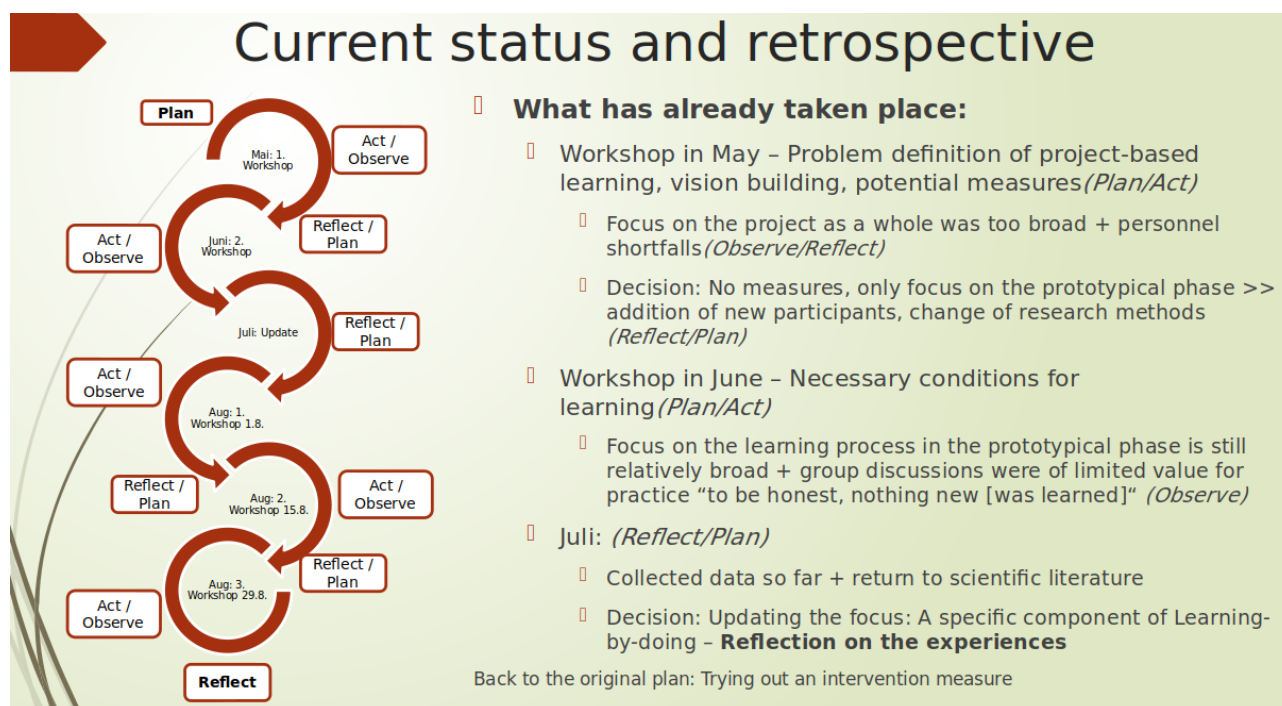


Figure 8: Iterative Action Research Cycles

Note: This is a translated version of the original German version that was shared with participants

The final process that happened: Extended problem definition and three mini cycles of interventions

The final process that took place was: Plan (May to July), followed by three small iterations of Act and Observe (the group reflection sessions) in August. A joint reflection on the study was included in the last workshop August. This process is described in Table 11 below.

The intervention that was conducted was to implement a social reflective practice through the use of a semi-structured group discussion to reflect on certain aspects of the prototyping phase. The decision for this was theory-based (as mentioned in the Literature Review section) as well as identified from the empirical data from the participants as part of the problem definition of the Plan phase. For example, one of the participants mentioned this as an enabling condition of project-based experiential learning: “Analyze the current prototype process: To what extent were the formulated (interim) goals achieved? Which were not or only partially achieved? Why not? What was good, what was missing? What changes do I need to make to make the next process more successful?” (Appendix C4: June 27 workshop - Selected survey responses, p. 140)

Table 11: Final Research Process

Date	Duration	Number of participants	Phase	Activity
May 18	1 hour	2	Plan	Interview with project management: How does learning work at the moment in the project?
May 23	2 hours	6	Plan	Workshop with project team: participatory problem structuring, vision-building regarding learning within the project (generally, not specific to prototypical phase/approach)
June 27	1 hour	8	Plan	Exchange and discuss the conditions for learning through prototyping and categorization between those within their sphere of influence vs. external to their influence
Aug 1	1.5 hour	6	Act & observe - mini cycle 1	Introduced the proposed plan and process of group reflection sessions, test run of the process as a group (Topic: Selection of use case for prototyping)
Aug 15	1 hour	3	Act & observe – mini cycle 2	Second iteration of the group reflection session with participatory selection of topic (Topic: Collaboration within the team during prototyping)
Aug 29	1.5 hour	5	Act & observe – mini cycle 3 Reflect	Reflection session on two topics: 1) Learning through the prototypical approach, 2) Reflection on the group reflection sessions.

Note: The number of participants excluded the moderators, observer (me), and note-taker

Detailed plan for intervention: Group reflection sessions as social reflective practices

The group reflection sessions were organized as three semi-structured, moderated group discussions. The plan was to first start with a test-run in the first workshop to test if the method was workable, followed by another iteration of the process in the second workshop to incorporate any changes necessary, and concluding with an overall reflection of the reflection process in the last workshop. Due to the absence of the project lead in the first two workshops, the third workshop was divided into a mini, third cycle of the group reflection session, followed by an overarching reflection of the intervention in general.

The discussion was structured based on the reflective learning material of Gordijn et al. (2018), which included many methods of reflective learning, albeit from a more formal learning (e.g., training) context. I selected the reflection method based on Kolb's learning cycle (Gordijn et al., 2018, p. 70), and added some additional questions based on other tools and the literature on critical reflection. The key design decisions and their corresponding rationale, as well as the sources of the questions are included in the Appendix (see Appendix B3: Intervention design decision documentation - reflection-in-action and Appendix B4: Questions for the intervention for more detail).

Using the elements of reflection sessions from Pammer et al. (2017), Table 12 below provides an overview

of the components of the intervention, which is a pre-scheduled session separate from the work process. Note that there are two objectives of the reflection session: The first objective is for the practitioners, whose aim from the session is to extract “lessons learned” that can be used for future actions, whereas the second objective is my objective as an *action* researcher, to provide a space to challenge the underlying assumptions behind past actions that led to undesired outcomes. For the purpose of reflection to enable organizational change, as mentioned in the Literature Review section, the latter is crucial (to improve practice). From a researcher’s perspective, I hope to gain a deeper understanding of process conditions that might be necessary for this deeper level of reflection to occur.

Table 12: *Elements of Group Reflection Sessions for the Intervention Conducted in this Study*

Element from Pammer et al. (2017)	In this study
Who reflects: Reflection Participants	Collaborative reflection process with "reflection helpers"
Reflection method	Semi-structured group discussion based on Kolb’s ELT
Reflection trigger	The session itself, specifically the guiding questions
Reflection objective	Participants’ objective: To reflect on past experiences and what can be learned from them (to improve future practice) My objective: To trigger deeper questioning of underlying assumptions for transformative learning through critical reflection
Reflection content	Individual perceptions of experiences gathered through the prototyping phase
Who should learn: Reflection scope	Project team (as individuals and as a team), with the intention of driving organizational learning within the Municipal Administration of Freiburg
Reflection outcome	Direct/tangible: Results documented in Conceptboard.

Referring to the criticism of conceptual blurriness in Kolb’s ELT model (see page 24), for this study, I assumed that the space for dialogue created by the reflection sessions allowed participants to recall experiences important to them, usually those with a certain amount of friction that triggers emotional reaction. Thus, the “concrete experience” here is defined as the ones that the individuals experience in the project, bearing in mind that the act of recall, communication, etc. has already transformed the experience itself from the “pure, pre-language” idea of concrete experience from Kolb or the idea of *intuiting* from 4I. Thus, although the cycle itself is used to structure the dialogue as per the reflective learning method, and although one could view the dialogue themselves as being a concrete experience, I will simplify my concept to define the concrete experiences as those moments within the project and not within the dialogue sessions.

Data collection

Participant selection

The participant list was decided with the input from the project lead and deputy project lead, and adjusted along the way as the focus of the research shifted. Although the original plan was to include all the work streams (at the least the work stream leads), due to the unexpected circumstances, there was a lack of representation from two work streams: Connected Participation and City Simulation. Given that participation is voluntary (not a priority compared to their daily responsibilities) and some workshops were held during the summer vacation period, not all participants contributed to and attended all sessions. The final participant list is shown below. Their attendance (or contributions in the case of survey responses) are detailed in Appendix B6: Participant list with attendance, p.134).

Table 13: Research Participant List

[Redacted for data privacy as per agreement with participants]

Primary work stream	Number of Participants	Department
Project management	3	DIGIT
Data Governance, Systems and Knowledge	2	<ul style="list-style-type: none">• Office for Project Development and Urban Renewal• Office of Citizen Services and Information Management
Platform architecture	1	DIGIT
City Simulation	1	Urban Planning Office
Mobility	1	DIGIT
Connected Participation	1	DIGIT

Participants will be referred to by numbers throughout the redacted thesis to provide semi-anonymity, although the project lead and deputy project lead will be mentioned in narrative on some occasions when their role makes a difference. Participant list (with full names) are provided in Appendix B6: Participant list with attendance for transparency of research process [this is omitted in the redacted version to protect participants' anonymity]. In addition, Moderator 1 did the moderation for all sessions other than the August 15 (where Moderator 2 moderated) and the August 29 workshop (where I moderated). An intern provided support as a scribe for the August 15 and 29 workshop.

Data collection methods

Data was collected through surveys with open-ended questions, through conducting one semi-structured interview, and from the workshops. The workshops and interview were conducted digitally and recorded (on the municipal administration's account on BigBlueButton). I then transcribed the sessions using OTranscribe. Written documentations from the workshops were collected via the use of Conceptboard and Collaboard as collaborative whiteboard tools. This was used as a method of workshop facilitation to allow for the participants' input (given the interactive nature of the workshop), as well as for documentation to be

analyzed as part of the research. These documentations were also published within the internal knowledge management platform for access by any project members (even those outside the research). The open-ended individual surveys were administered through Qualtrics and sent to the participants prior to the workshops. The following table summarizes the data collected.

Table 14: *Data Collection*

Data Type	Total amount
Transcripts (interview and group discussions)	9 hours
Open-ended survey responses	10 surveys
Conceptboard	5 boards

Relevant collected data directly referred to in the thesis is included in Appendix C: Relevant Raw Data, starting from page 135.

In addition, reflection and observation notes from participant observation were documented as part of my employment engagement with the project team. Document analysis of relevant texts from the internal knowledge management platform (Confluence) provides important contextual data. This provided a richer understanding of the phenomenon and case study context and was important to check my assumptions and interpretation of the setting. This is supported by my reflection notes regarding the research process, such as in documenting the difficulties when planning the intervention.

Data analysis

The data was analysed through an interpretive, abductive, and iterative approach characterized by a continuous back and forth between theory and data, in order to identify themes that emerged. This corresponds with the bottom-up “in-situ” development of “experience-near” concepts as described by Schwartz-Shea and Yanow (2013) as well as the “grounded theory” approach (Khan, 2014; Zuber-Skerritt & Fletcher, 2007). Here, I refer to the use of the approach, although the goal was not to develop a theory from this research. Data collected throughout the research process were analysed preliminarily to inform the next step of the research. This preliminary analysis was done through high-level, first thematic coding to check against the understanding from the literature at that moment, and identify potential areas for further investigation. For example, preliminary analysis of the survey responses and workshop outcomes led to renewed review of literature (to find ways of understanding the themes that emerged from the data), which further informed the research design and data collection for the next cycle. At the end of the interventions (after the last workshop in August), several rounds of data analysis were conducted. Most of the coding was done in Max QDA Lite. Additional methods, such as using the commenting function on the collected data (in documents) or the manual (non-digital) categorization of themes were also used. The data analysis at this stage was abductive – incorporating inductive and deductive elements. The first round included the application of certain initial codes from key theories from the literature review (such as ELT from Kolb, 2015, and 4I from Crossan et al., 1999), as well as codes generated from the text (close-to-text inductive thematic coding). This provided an overview of the match between the theories and the data, leading to the search for additional literature that might support a more productive analysis, such as the addition of Baker et al.’s experiential learning conditions. Subsequent rounds of coding then included the merging of certain

codes generated from the text. This was complemented by a brief review of all the reflection and observation notes from the research process and participatory observation. These were then informally coded (key themes documented on a high-level basis) and organized according to the categories that emerged from the data. Based on the analysis and the themes that emerged, I deemed the findings to be in different categories (such as the conceptualization of learning vs. challenges with social reflective practices), which is why I decided to structure the analysis into the separate phases and categorize the findings in such a way. This then led to an updated analytical framework, which was re-applied to the final analysis of the data that was presented in the Findings and Discussion.

Reflections on the methodology

The most significant limitation to the selected research approach was my lack of familiarity with the key components: trans-disciplinarity, action-orientation, interpretivism. These were ideas new to me and I struggled to find ways to incorporate them appropriately into the research. I tried to mitigate this through learning more about these topics, communicating with researchers who are more familiar with them, but ultimately, as Prof. Villsmaier told me in a personal communication, the only way to understand how to do it is from experience, which I obviously lack. Perhaps this is another evidence that social learning and learning from studying have its limitations that only experiential learning can overcome. In particular, the data analysis process leaves much to be desired in terms of being systematic or rigorous and could be improved if I were to conduct such a research again, building upon my experiences gained from this time.

In trying to incorporate the participatory principle of transdisciplinary and action-oriented research, I kept the unit of analysis to be flexible to be co-decided by the project team, that is, whether we should focus on project-based learning generally or specifically on the learning-through-prototyping during the prototypical phase. This flexibility led to a certain amount of uncertainty and delays, and ultimately, I had to impose my research decision on the team: to focus on the learning process from the prototypical phase. Even though I did consult with the project managers and asked participants to raise any issues that they had, this approach was only somewhat participatory in the consultative sense. Regardless, there was evidence that this corresponded to a practical need, since in my participatory observation during my employment engagement, I noticed that the question of “how do we learn from the prototyping” came up on multiple occasions.

My relation with the participants as part of their team may also have affected the findings, e.g., in that they may have expressed more positive feedback about the intervention than they actually think. For example, they frequently asked me if “I was happy with the result” or if “this is what I wanted”, suggesting that the fact that this is “my research” remains highly salient and may have affected how they answered the questions or participated in the discussion. In addition, I could not cross-check my interpretation and analysis of the data, such as was done by Crossan and Berdrow (2003). This suggests that the findings inevitably contain biases due to my proximity to the team or due to my own personal background.

Section 4 - Findings and Discussion

Introduction to the findings and discussion section: Goals, process, structure

The goal of this section is to present the findings from the study for ease of comprehension (product-oriented write-up with clear line of argument) while staying true to the process-oriented nature of action research. In essence, I hope to combine the advice from different sources in a way that is satisfying to both the reader and me as the writer, taking into account the difficulty of reporting on action-oriented research complying with conventional academic standards (Dick, 1993; Fisher & Phelps, 2006; Zuber-Skerritt & Fletcher, 2007).

However, one should be bear in mind that the process of action-oriented research is exceptionally messy, as described in the Methodology section (Fisher & Phelps, 2006; and supported in literature such as in Zuber-Skerritt & Perry, 2002). Combined with my lack of experience as both a researcher and especially with conducting action-oriented research, the process has significant implications on the research findings, which is why I have included reflections of the process within each subsection (Plan, Act, Observe) and not at the end of this Section 4 (Findings and Discussion).

Keeping the goals and process in mind, this section is structured by organizing the findings and discussion into subsections by the different phases of the action research cycle: Plan, Act, and Observe. Due to the process-oriented nature of action research, I found it more appropriate to integrate the findings and discussions of each phase with the literature “interwoven” in the section (as recommended by e.g., Fisher & Phelps, 2006). Specifically, each phase will present the findings integrated with a preliminary analysis, followed by a subsection “What can we learn from this phase” in connection with the supporting research questions of that phase. Methodological reflections are also presented at the end of each phase’s subsection. The purpose of these reflections is not to provide a basis for replicability, but to provide transparency on the process of data collection and its implications on the analysis presented. Section 4 - Findings and Discussion is then followed by Section 5 - Overall Discussion. This section corresponds to the Reflect phase to highlight the key findings of the study in relations to the central research questions and research objectives, to evaluate the study with regards to its limitations, and to provide suggestions for future research.

Table 15 below summarizes the structure of the Findings and Discussion session through the depiction of an updated analytical framework. An elaboration on the structure is presented in the following paragraph.

Update on the analytical framework

As part of the iterative process navigating between findings and literature, the analytical framework can be updated to include the following analytical questions, which inform the analysis of the findings and the write-up of the discussion (semi-integrated with the findings by phase).

Table 15: Updated Analytical Framework

Phase	Action and research objective by phase	Supporting research questions	Relation to findings and discussion
Plan	<p><i>Action objective:</i> To identify an intervention that can be executed during the thesis research project</p> <p><i>Research objective:</i> To gain an understanding of the case study context through exploring the conceptualizations of learning from prototyping (primarily addressing RQ1) and factors that are perceived as important in learning from such approaches in a project teams (primarily addressing RQ2)</p>	<ul style="list-style-type: none"> • RQ 1.1: How can we conceptualize the role of learning-by-prototyping project approaches in enabling municipal organizational transformation? (Literature review) • RQ 1.2: How do the participants conceptualize their learning process through prototyping? (Empirical) • RQ 2.1: What factors do participants perceive as important for incorporating learning during the prototypical phase? (Empirical) 	<p><i>Analytical question:</i> What can be some implications of the conceptualizations within the project team on the learning process of learning-by-prototyping and its potential for municipal transformation?</p>
Act	<p><i>Action objective:</i> To test a social reflective practice by implementing a group reflection session as an intervention</p> <p><i>Research objective:</i> To explore the challenges of conducting group reflection sessions (primarily addressing RQ2)</p>	<ul style="list-style-type: none"> • RQ 2.2: What types of challenges arise in the design and implementation of group reflection sessions within the project? (Empirical) 	<p><i>Analytical question:</i> What can the design and implementation of group reflection sessions reveal about the deeper challenges of the learning process?</p>
Observe	<p><i>Action objective:</i> To observe the potential of the intervention in improving the learning process</p> <p><i>Research objective:</i> To explore the role that group reflection sessions can play in enabling learning (primarily addressing RQ3)</p>	<ul style="list-style-type: none"> • RQ3.1: What types of outcome on the learning process can be observed through the implementation of the group reflection session? (Empirical) 	<p><i>Analytical question:</i> What are the implications of the observed outcomes on organizational learning? How do the challenges in the process relate to the outcomes observed?</p>

The first subsection corresponds to the Plan phase of the action research cycle, which is the problem definition phase of the intervention-based approach. Here, I first present the findings regarding the participants' conceptualization of learning through the prototypical approach within the project team and their factors they perceive to be important in such a project approach. Then I include an analysis of the implications of these conceptualizations on the learning process and how it relates to the conceptualization from the Literature Review section (i.e., project-based experiential learning *for* organizational transformation in the municipal administration towards new governance approaches). This addresses the population and knowledge research gaps by empirically studying the learning process of the project team. The second part of the research phase (Act) aims to address the practical-knowledge gap by building upon the empirical findings and the literature review, honing in on one particular aspect through an intervention: the role of social reflective practice in learning. In this subsection, I present the findings from the experiential knowledge gained by addressing the research question "what types of challenges arise in the design and implementation of a group reflection session within the project?" and consider what that suggests about challenges to the learning process. The Observe phase is closely linked to the Act phase in its deepening of the exploration of the role of the group reflection sessions. Observations of the outcomes of these interventions suggest the roles that they can play in the learning process. This is followed by an analysis of how these outcomes relate to organizational learning and examines the implications of the process challenges from the Act phase on the outcomes.

This Section 4 is then followed by Overall Discussion section (Section 5), where I engage in synthesizing the findings of the study as a whole. Here, I analyse the findings across the phases by referring back to the overarching research objectives and the central research questions. In addition, I reflect on the assumption in the research purpose that a more effective project-based experiential learning process will contribute to the adoption of better governance approaches. I also include self-critical reflections on the research process and limitations of the research.

Plan: Understanding the context and problem definition

Participants' conceptualizations of learning within the project, perceived challenges, and enabling factors

The aim of the Plan phase of an action research is to create a shared understanding of the thematic work concern of the participants and the researcher. This is necessary to create a shared problem definition as a basis for determining the measures to be taken as part of the action research (Craig, 2009). In my study, the Plan phase included the joint problem definition in the workshop in May and the group discussion in June. Through the survey responses and the kick-off workshop held in May, different understandings of the concept of learning emerged. The participants had a diverse understanding of what constitutes learning, the goals of learning, and how learning occurs. Consequently, this was reflected in their ideas about the challenges and enabling factors for learning within the project that was raised in the June workshop.

Participants' conceptualizations of learning

As mentioned in the literature review, many conceptualizations of learning exist across different fields. The conceptual framework developed in the literature review is my understanding based on the (iterative)

integration of data and theories. Here, instead of imposing that theoretical lens onto the context, I will present the “in situ” concept in the case study context (Schwartz-Shea & Yanow, 2013). Accordingly, I found it helpful to start by using Armitage et al.’s (2008) framework as analytical categories, even if their study focuses on learning in adaptive co-management. Despite the difference in unit of analysis, I found the categories to be broadly applicable in this case. Thus, I presented the findings regarding the participants’ conceptualization of learning in the following structure from Armitage et al.:

- (i) definitions of learning
- (ii) learning goals and expectations
- (iii) mechanisms by which learning takes place
- (iv) questions regarding who is involved in the process of learning
- (v) the risks and ethical ambiguities faced by different actors expected to willingly participate in a learning process, whether formal or informal.

(i) Definitions of learning

The following table provides some examples of what constitutes learning according to what participants expressed. These different conceptual understandings can be traced to similar debates in the literature, which I have outlined within the following structure as well. The purpose of these descriptions is to illustrate the difference in the concepts of learning and the potential implications for project-based learning based on each understanding. This is not meant as an authoritative depiction of the concepts of learning, nor is it a full depiction of the conceptualization of learning within the project team, due to the limitations of the data collected, as mentioned in Reflections on the methodology (p. 55). Quotes are selected based on their suitability to illustrate each definition, but it should be noted that some are from one individual’s point of view, illustrating that different definitions could co-exist and are not necessarily mutually exclusive.

Learning only when it is applied

Learning is when new knowledge is gained and when this is successfully applied.¹(Appendix C2: May 23 workshop - Selected survey responses, p. 138, own translation)

Relation to literature: This relates to a debate in learning in general (cognitivism vs. behaviourism), which is also reflected in organizational learning (see, e.g., Easterby-Smith et al., 2000; Dekker & Hansen, 2000, as cited in Olejarski, 2019). The core of the debate is whether a change in cognition can be considered learning or if a corresponding change in behaviour is necessary. Within organizational learning, this debate has moved to a more integrative approach of considering both change in cognition and change in behaviour as learning (Easterby-Smith et al., 1999).

Potential implications of this definition: This implies that learning can be completed once knowledge has been “successfully applied“, but also that if something is not applied, it has not been learned. According to this perspective, project teams should thus focus on providing opportunities for their members to apply their

1 This particular understanding was emphasized in more detail by P9 in the August 15 workshop, see Appendix C7: Aug 15 Reflection session - Selected passages from the transcript, p. 146, timestamp 13:03 or 1:01:21 for more detail.

knowledge through hands-on interactions, either through simulated exercises or through actual problem-solving as part of the project. Although such a definition might mean learning may be easier to measure, it is questionable whether all learning can fall into this category. For example, certain knowledge cannot easily be applied because of the nature of the knowledge itself (such as an understanding of abstract concepts) or when there are constraints in the environment (e.g., we *know* we need to hire more personnel for the project to achieve our goals, but that is not possible).

Learning is a continuous, open-ended process

We are creating quite a lot of blueprints in this project, so many others, and that's how it is, there are constantly new discoveries on a discovery journey (P1, Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 137, timestamp 44:40, own translation).

Relation to literature: This idea can be found in many concepts in the learning and workplace learning literature, especially in recent developments, such as in the idea of lifelong learning or adult education (Boud, 1998; Illeris, 2018). In particular, this idea corresponds to the understanding of learning that underpins Kolb's ELT (2015), as illustrated through the characteristics of learning defined in his book, "Learning is best conceived as a process, not in terms of outcomes" and "learning is a continuous process grounded in experience" (pp. 37-49).

Potential implications of this definition: Learning goals and outcomes might not be easily defined or continuously changing. Project teams would need to reflect regularly on their learning journey along the way and adjust instead of conducting lessons learned only at the end / completion of the journey.

Learning as an individual-driven process

It means maybe to advise someone in a one-on-one conversation, to consider together, okay, what are my learning goals, how do I approach those learning goals, do I even have time to learn at all, how do I want to develop myself, and how can I evaluate that (P1, Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 137, timestamp 39:21, own translation).

Relation to literature: This idea that learning should be owned and driven by the individual (instead of prescribed by an external party such as the organization) corresponds to many strands of learning theories and literature, such as the humanist understanding, reflective practitioner, adult education, and especially in education sciences (Illeris, 2018).

Potential implications of this definition: Individuals are the core focus of any organizational learning process, and the project team and organization learn by providing the supportive structure for individuals to develop themselves according to their own interests and goals. While project teams and the organization may impede or facilitate the individual's ability to learn, it is ultimately the individual's responsibility to manage their own learning process. On the other hand, organizations may need to negotiate the tension of what the individual wants to learn and what the organization needs the individuals to learn (Elkjaer, 2004).

Learning happens “after the fact”

I think in any case [learning is] time-delayed from the moment when you hear it for the first time, so to speak, and then it can be different. Either when you try something yourself or can adjust, or actually sometimes at night or during a walk or so, such an aha effect. (P2, Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 137, timestamp 31:10, own translation)

Relation to literature: This corresponds to the idea of learning through thinking or reflection (Moon, 2004). That knowledge must first be processed (either consciously or unconsciously) to fit into one’s own interpretive structures in order for learning to be incorporated (Cunliffe, 2002; Migliore, 2020).

Potential implications of this definition: Change in behaviour is not by definition necessary for it to be considered learning, but can be the outcome of such a learning occurring. It suggests that it would be hard to measure learning (how and when should it be measured, if it is delayed?) or actively supported (how to support learning if the processing happens in the “background”). Organizations and teams could only provide individuals with certain input, e.g., through formal training curriculum, and then “hope” that the individuals can work it into their “knowledge base” at their own pace at some point.

Learning happens regardless or automatically

I mean, (learning) happens one way or another (P1, Appendix C9: Aug 29 Reflection session - Selected passages from the transcript, p. 151, 45:25, own translation)

Relation to literature: I did not find this concept of learning directly in the literature review that was conducted, although it is aligned with the concept found in the study from Evans et al. (2021) that learning in these projects are often assumed to happen. Could this be related to the understanding of learning not as a way of knowing the world, but as a way of “being in the world” (Gherardi, 1999 as cited in Chiva & Alegre, 2005)? In which case, this underlying assumption could explain the practical-knowledge gap on why there is not enough focus on learning explicitly?

Potential implications of this definition: Learning is assumed to happen just by an individual’s collection of experiences, thus neither the project nor the individual need to expend much effort into tracking and managing learning per se.

Definitions of learning: Just an abstract debate without practical implications?

Although not exhaustive, these different definitions of learning illustrate the diverse ideas underlying learning, which could be traced back to the philosophy of knowledge and learning. This categorization of “definition of learning” does not seem very helpful as an analytical category, as the definition of learning is often tied to the other aspects of learning, such as the process (e.g., “transformation through experience” per Kolb, 2015) or the goal (e.g., transformative learning per Mezirow, 1990). In fact, in the article from Armitage et al. (2008), they refer to the definition of learning as theories of learning (social learning, experiential learning, transformative learning), which contains elements overlapping with the other categories. An alternative analytical category that would overlap less with the others might be “underlying perspective of learning and knowledge” or something to that effect, for example based on the work from Chiva and Alegre (2005) such as the social-process perspective of knowing vs. the cognitive-possession perspective of knowledge as basis for the idea of learning (the former being indistinguishable from knowing,

the latter being the process through which one gains knowledge).

Practitioners may think that the conceptual debates are of limited practical value, and are thus not important to address. Indeed, that seems pragmatic, given that the question of what constitutes learning, and relatedly what constitutes knowledge could be traced back to Greek philosophers like Aristotle (Bolisani & Bratianu, 2018). After all, a plurality of perspectives in a team may be unavoidable. Nonetheless, it may be productive to achieve at least awareness of the different definitions available in order to establish a shared understanding as a basis for joint action. For example, if learning must include the application of knowledge or skill in order to be considered learning, then one could argue that it would be meaningless to evaluate the learning process of the prototyping phase until after the implementation has been completed (i.e. the DATEN:RAUM:FREIBURG solution has been launched). Otherwise, the project members would not yet have applied the knowledge they gained from the prototyping. On the other hand, if learning is seen as a continuous, open-ended process, it can be evaluated and reflected upon on an ongoing basis, and if necessary, adjusted during the process itself.

(ii) learning goals and expectations

Participants provided different goals of learning within their survey responses and in the group discussions, which are summarized in the following table. As above, quotes are selected based on their suitability to illustrate each definition. Appendix D1: Learning goals and expectations includes the original quotes in German and the source of these quote segments as additional reference.

Table 16: *Participants' Learning Goals and Expectations*

Goal	Example quote
Better understanding of complex reality	"Helpful to better understand complex issues we are dealing with."
To improve project performance	"To improve collaboration in the project."
Skill acquisition	"To acquire the skills you don't have e.g., project management, Jira, new forms of awarding contracts, but also methodological competence (public service design)."
Problem-solving	"Project-based learning: Learning based on problems in the project --> How do I solve a problem? --> Collect and evaluate information (connect with colleagues, books, training) --> Try out a solution, if the solution does not work, try out other options."
To deal with new things	"In this project, we work on topics that are not known or partially known. We use methodologies that we have never or not yet applied. We use approaches...which also have not been used so far. We use systems, which have not been used before. And all this requires that all these systems, methods, approaches have to be learned."
To avoid future mistakes	"In order not to only start making mistakes in the big call for tenders, but rather to work off as much as possible beforehand, I would say, in terms of mistakes, but also in terms of experience, which we simply need in order to be able to tackle this big call for tenders at all."

These goals can be seen as interrelated, not mutually exclusive, and potentially suggesting a tension between the individual and the group. Many can be seen as subordinate goals of learning towards the overarching goals, such as the overarching goal of individual self-development, and/or the development or improvement of the group's or organization's problem-solving capacity. For example, project management intended to implement the use of the project management tool "Jira", in order to improve collaboration within the team. They thus have the motivation to learn how to use Jira (learning to acquire skill for self-development). This means that the ultimate goal of learning to use Jira is not just the acquisition of that skill as an end itself but as a means to an end (improved collaboration). On the other hand, different individuals may have different goals for learning, which is not necessarily an issue, as different goals could theoretically be pursued simultaneously. However, (Elkjaer, 2004) argues that there is a tension between the individual's goals and the organization's goals, and that organizational learning includes learning how to negotiate this tension.

In addition, these learning goals raise the question (inadequately addressed in the analytical category of "definition of learning"): What needs to or ought to be learned? What is considered knowledge or skill? For example, skills can be something more "mechanical" such as the skill to use a new digital tool, or more "soft" skills, such as how to manage a cross-departmental project. Jennifer Moon (2004, p. 15) argues that although many things may be categorized under the umbrella term of "skills", they mean very different things with very different learning requirements. Many of these skills require different knowledge to fulfil these learning goals, both context-specific knowledge gained from experience, as well as "book" knowledge that can be acquired through "studying". For example, when working with a digital tool within the project, the practitioner will need to have the "book" knowledge on how such a tool works (e.g. the available functionalities, where to click, etc.), the context-specific knowledge of the project to understand how to "apply" this tool in this setting (e.g. understanding the *Spielregeln*, the team's unwritten and written norms), as well as trial-and-error knowledge from experience (e.g. appropriate use based on past experiences). This suggests that clarifying the types of knowledge and skills required by the learning goals can help clarify the understanding of the learning process and how to improve it.

(iii) mechanisms by which learning takes place

From survey responses and group discussions, different ideas emerged about the mechanisms by which learning takes place. These mechanisms encompass concepts from different learning theories. The first table below presents the different mechanisms with exemplary quotes illustrating them, as well as their underlying concepts. The second table then groups these concepts into the learning theories or fields of study from the literature. Original quotes in German and the sources are listed in Appendix D2: Learning mechanisms.

Table 17: *Learning Mechanisms as Perceived by Participants and Corresponding Concept*

Mechanisms	Example quotes	Concept
Learning by acquiring knowledge or skill from others (internal or external)	“And apart from that, it often works bilaterally - i.e. in one-on-one meetings where it is briefly explained how something works or why it is beneficial, for example.” “Participating in a conference.”	<ul style="list-style-type: none">• Learning from knowledge sharing• Learning from experts
Learning through formal education programme	“But of course [learning] also comes from external sources. We have always sought support [from outside] or attend training programmes ourselves and then we bring this [knowledge] indirectly into [the project].”	<ul style="list-style-type: none">• Learning from training
Learning through creating shared meaning	“At the beginning of the project, where we first tried to find the use cases [...] that was difficult to explain why we are making this effort, ‘we know what we want after all’, but in the end everyone got on board [...] we did most of it, in the workshops, of course we also saved our definition on Confluence, so that everyone can look up the terms again.”	<ul style="list-style-type: none">• Learning from social construction of knowledge
Learning from prototyping	“Prototype --> learning how to build a platform, where mistakes can be made, what are all that needs to be considered.”	<ul style="list-style-type: none">• Learning by trial-and-error
Learning from repeating / applying something	“The person must try it himself or herself, to apply it, until it is actually learned, I would say.”	<ul style="list-style-type: none">• Hands-on learning• Learning through repetition
Learning through documentation	“Documenting knowledge gained (including mistakes).”	<ul style="list-style-type: none">• Knowledge capture (externalization of tacit knowledge to explicit knowledge)
Learning by “processing in the background”	“Basically, you hear something, and then the brain processes that somehow, and only after the fact do you sort of get this moment of the ‘lightbulb going on’ and the learning has occurred and learning has taken place.”	<ul style="list-style-type: none">• Learning (gaining insight) from incubation

These concepts can, in turn, be roughly categorized into different learning theories or fields of study, shown in Table 18 below. Although this study largely does not align with the Knowledge Management literature because of its more positivistic leanings towards knowledge as a stock (that can be possessed, transferred, etc.), it is a dominant theoretical perspective in practice, especially within IT-related fields. Thus, it is represented here. However, two concepts from the findings did not fit neatly into the literature that informed this study. One is a theoretical perspective that I encountered little in the literature I focused on, due to its focus on individual learning. This is the idea that learning happens (often unexpectedly and unplanned) after the brain “processes the information in the background” (as was mentioned the Definitions of Learning above). This can be referred to as the “eureka” or “aha” moments, often when the individual is engaged in something else (e.g. a “mindless activity” while the mind wanders). A quick search of grey literature confirms my belief that this is a common idea of learning, and here I have assigned it to the “Cognitive / information processing” field of study (Albrecht, 2017; Migliore, 2020). The second concept assigned to fields of study is “learning from training” as it is as very broad concept that could incorporate social learning, experiential learning, adult education learning, etc. Thus, I have broadly assigned this to management learning or educational sciences as fields of study.

Table 18: *Categorization of Concepts by Theory or Field*

Theory / Field	Concept
Social learning (see overview of social-process perspective in Chiva & Alegre, 2005)	<ul style="list-style-type: none"> • Learning from social interactions • Learning from social construction of knowledge
Experiential learning (see, e.g., Kolb, 2015)	<ul style="list-style-type: none"> • Learning by trial-and-error • Hands-on learning • Learning through repetition
Knowledge management (see, e.g., North & Kumta, 2018)	<ul style="list-style-type: none"> • Learning through knowledge capture (externalization of tacit knowledge to explicit knowledge) • Learning from knowledge transfer
Cognitive / information processing (see, e.g., Migliore, 2020)	<ul style="list-style-type: none"> • Learning (gaining insight) from incubation
Educational sciences / management learning (see, e.g., Boud, 1998)	<ul style="list-style-type: none"> • Learning from training • Learning from experts

The idea of how learning happens is related to the definition of learning, and similarly may contain differing theoretical perspectives underlying the concept of learning. The table above is not meant to be an authoritative categorization of these concepts, given that even within each learning theory there are

differences (see, e.g., Reese, 2011 for an exploration of other experiential learning theories). Rather, it further illustrates the diversity of meaning implied with the term “learning”.

(iv) questions regarding who is involved in the process of learning – learning by whom

The structure from Armitage et al. (2008) refers to learning in adaptive co-management initiatives that involve many stakeholder groups of differing power relations and backgrounds (e.g., marginalized fishers, NGOs, governmental representatives, etc.). In our case of learning for organizational change within municipal administrations, the question is qualitatively different. However, key considerations by Armitage et al. could still be relevant in this setting. For example, regarding breadth of participation and degree or extent of involvement, it is worth asking which teams or groups are given the opportunity to “innovate” or have the permission to “fail” when learning-by-doing. Are only those who are perceived as curious and “capable of learning” (*lernfähig*) allowed to learn? For example, one challenge mentioned is that “not everyone wants to learn” (see, e.g., I. A., Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 135, timestamp 17:20, own translation). The question is: should/could all employees be given the “permission to fail”? Or should organizations focus on certain change agents or frontrunners? Within the cross-departmental DATEN:RAUM:FREIBURG, the project members from the *digital.freiburg* team are seen as innovative with a high motivation to learn. They perceive themselves as change champions aiming to bring innovation and change into the organization, as stated by the project manager “With this project, we also want to transfer knowledge to the rest of the municipal administration, so to speak” (I. A., Appendix C9: Aug 29 Reflection session - Selected passages from the transcript, p. 151, timestamp 45:25, own translation). However, one factor why the projects of the *digital.freiburg* office can be more innovative is because the types of projects involved are more amenable to learning-by-doing (even the prototyping approach is typical of iterative, “agile” software development processes). Other departments may be implicitly excluded from such learning opportunities due to the nature of their work (e.g., too “high stakes” if it involves providing essential social services, or lacking in resources due to lack of political priority), even if these departments also have the need to change and can benefit from such approaches or the underlying mindset behind these approaches.

Even within the project team, the resource allocation percentage (*Anteil*) between the project members was different and most members were only involved in the project on a part-time basis, which made it harder to learn for some than others, even if the learning curve was equally steep for all. Thus, it would be important to be cognizant of this aspect of learning even within a project setting, which may seem relatively homogenous at first, but is quite heterogeneous in reality. Within the cross-departmental project teams, the differing institutional logics and capacity of each member highlight the importance of techniques used to facilitate participation of these members. The project manager was aware of this, as he stated, “we want to build an environment where learning can take place, practically undisturbed, or build a framework where this cultural change can also take place” (I. A., Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 136, timestamp 13:20, own translation).

(v) the risks and ethical ambiguities faced by different actors expected to willingly participate in a learning process, whether formal or informal

There was not much data gathered on this point, as it was not a factor considered during the data collection¹³. This could be a reflection of the difference in the context as compared to the municipal administration, given that this analytical category is based in complex socio-ecological systems of power imbalances. However, even within this context, it was mentioned that learning is hard and can be painful (I. A., Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 136, timestamp 04:15, own translation). The risks of learning for the individual can be implied in some of the common challenges to learning – such as lack of time due to competing priorities. Here, it can be implied that the risk to the individual would be that they might not accomplish other priorities or obligations if they were to undertake a learning process, as learning requires time and effort that could otherwise be used for fulfilling other tasks. In most work environments, the assumption is that the employees are paid for completing their tasks, and the employee should thus already have the qualifications to do their job. Thus, learning is either assumed to be unnecessary or it may be seen as only necessary for their *further* development (*Weiterbildung*) such as through training and development programs, where the risks are minimal because it is in a simulated environment. Although learning-on-the-job is also recognized as important, employees seldom have the explicit space to learn through trial-and-error. In particular, employees in the public sector can rarely take the risk of failure because governments are expected to function well, thus increasing the risk for any individuals or teams seeking to learn through trial-and-error in municipal administrations. (Gilson et al., 2009).

Project participants' conceptualizations vs. Conceptualization of learning for organizational change through learning-by-doing

In summary, by using the analytical categories to deepen the examination of the conceptualizations of learning within the project, it is revealed that there are varying and sometimes contradictory ideas of learning. Most of the concepts lean towards the cognitive-possession idea of knowledge management that is prevalent in the business and IT industry, given that Nonaka's Knowledge Management theory (1994) is very popular in this field (North & Kumta, 2018). Nonaka also holds the underlying assumption of social construction of knowledge, but leaning towards positivistic notions (Chiva & Alegre, 2005). In their view, learning requires the transmission of tacit knowledge from the individuals into the group and the organization via externalization, which implies that learning involves the attainment of explicit knowledge from the (social) environment. This view has a more positivistic leaning if compared to the social-process view of the social construction of knowledge. In the latter view, not only does the social interaction itself shapes and transforms the *knowing*, socialization also shapes the individual's mental models used in the *knowing*.

How do these conceptualizations compare with the conceptualization of learning in my literature review? Although the diversity of opinions and perspectives means that some aspects overlap, some key differences can be seen. First, as mentioned above, because the underlying perspective tends toward the cognitive-possession view, they tend to speak about knowledge *sharing* and knowledge *transfer* than knowledge co-

13 This was mostly due to the fact that I did not consider using Armitage et al.'s structure until after the data collection is completed

creation or social construction of knowledge. This also can be seen with the individual focus on learning, for example, that individuals should be given the *conducive environment* to learn, as opposed to focusing on the *social interactions* for learning. The underlying idea is thus that individuals need to be able to learn in a conducive environment (maximize individual learning), then spread their “knowledge” to the group and the organization through “knowledge transfer” (organizational learning). Hence, the goal of social interactions would be to exchange “ideas” or “knowledge” with each other (the idea of externalization of tacit to explicit from Nonaka), instead of socially constructing knowledge. However, it is questionable whether this conceptualization of learning is sufficient when considering the need for organizational learning towards adapting governance approaches, to ones more adequate to deal with complexity. The role of reflection is mostly either absent in these conceptualizations, or only at the individual level (once I am done reflecting, I learn, and then I can “share” what I learned with others, who can “absorb” such learning). Often in these cases, the sort of critical reflection Mezirow (1990) argues as necessary for transformative learning is absent, which makes it hard for the type of reflective capacity that Senge (1994) argues as necessary for a learning organization.

The implications of this conceptual diversity will be described further in the discussion part of this subsection, after the presentation of the findings on enabling factors for learning through prototyping in a project.

Enabling factors for learning through prototyping in a project

What factors do research participants perceive to be important for project approaches incorporating learning through prototyping? Factors for project-based learning are first presented, followed by factors for learning through prototyping. The factors for project-based learning are categorized at the individual, team and organizational level, referring to where this factor mainly lies. Although, as indicated in the 4I model, there are naturally feedback and feed forward loops that may influence these factors from other levels. For example, although the factor of individual motivation to learn is at the individual level, this can be influenced by the organizational level, such as having a supportive culture for learning.

Note that the exemplary quotes include the formulation of the factors as challenges and as enabling conditions, due to the questions posed. The original quotes and their sources are listed in Appendix D3: Important Factors for Project-based Learning, p. 157).

Factors important for project-based learning

Table 19: Important Factors for Project-based Learning

Level	Factor	Example quote
Individual	Individual motivation to learn	"Willingness/openness to learn is not always available"
	Understanding of the necessity of learning	"The acceptance that 'one doesn't know everything"
	Incentive to share information	"What do I gain from sharing what I learned?"
	Availability to learn	"Time for learning"
Team / Project	Structure and process for learning in the project	"There is no systematic or targeted learning"
	Match of learning capacity and learning requirement	"Overwhelmed with too many new tools and methods"
Organization	Culture of learning from mistakes	"Error culture... unfortunately not strongly established in the municipal administration"
	Institutional structure	"Hierarchical structures in the administration present obstacles to getting things off the ground quickly and easily"
	Competing priorities	"Too little time due to daily routine operations"
	Information availability	"Information shortage"

Unsurprisingly, many of the factors mentioned by participants for project-based learning are also found in the literature. For example, Schindler and Eppler (2003) mentioned that most of the barriers can be related to time, motivation, discipline and skill (see p. 221 for the list of examples). This corresponds to many of the challenges mentioned. In addition, the organizational factors correspond to empirical evidence covered in the review by Gilson et al. (2009) of organizational learning in the public sector. For example, as previously mentioned, the difficulty of learning by trial-and-error due to government departments be held harshly to account over mistakes. This can then lead to a culture that does not view mistakes as a source of learning and therefore has difficulty learning productively from them. In addition, the lack of emphasis on structure and processes to enable learning has been identified in the literature (Evans et al., 2021).

However, as can be seen with the conceptualizations of learning, there was not much mention of reflection and joint meaning-making as factors for learning. Although it must be noted that I did not follow up to delve into what they mean by "time for learning" for example. How would they use this time if they had it? Would it be to attend training programs? Or to spend more time in dialogue with each other?

Factors important for learning through prototypical approach

Participants were also questioned regarding their perceptions on the factors that are important specifically for learning through prototyping (rather than general project-based learning). Note that in this case, the focus is rather on an explicit prototyping phase in projects, rather than the general learning-by-doing that might happen from learning-on-the-job. The original quotes and their sources are listed in Appendix D4: Important Factors for Learning Through Prototyping.

Table 20: Important Factors for Learning Through Prototyping

Factor	Example quote
Ability to accept failure	“Acceptance of the general public in case of failure -> Implementation of prototypes should therefore have realistic requirements and not be completely detached from reality.”
Alignment between the political level and the specialist level	“Top management is very interested in quick solutions. There is a danger that the necessary iterations will not be conducted. Too little testing is done or the most urgent problem is not solved because users are insufficiently involved.”
Ability to change or be independent of existing institutional structure	“Insistence on decision-making powers by management personnel, heads of offices. Rigid rules, bureaucracy, processes in the administration”
	“Minimize external dependencies”
Time to implement methodologies (properly)	“In theory, we know all the methodological approaches that are needed. The ideal prerequisite would be to have enough time to actually implement the individual steps.”
Reflection and evaluation of experiences	“Analyze the current prototype process: To what extent were the formulated (interim) goals achieved? Which were not or only partially? Why not? What was good, what was missing? What changes do I need to make to make the next process more successful?”
Documenting lessons learned	“Continuous documentation of positive and negative impressions should accompany the entire process, so that the learning outcomes and experiences are not lost”
Team composition	“Heterogeneous team”
Time frame for prototyping	“Extend time window for implementation”
Prioritize the project / prototyping process	“During the prototype phase, carry out only the work that is necessary for it and no other projects.”
Clarity on time requirement for members	“From my point of view, DIGIT must clarify how much personnel capacity (time expenditure, etc.) are expected from the project participants. The agile way of working so far conflicts with the usual processes within the municipal administration.”

These conditions were rated based on the participants' perception of the project's level of influence on the factor and impact of the factor on the learning process, then placed in a matrix accordingly (see Appendix C5: June 27 workshop - Selected workshop outcomes in Conceptboard).

Some of these conditions for learning through prototyping overlap with the conditions for project-based learning. However, time as a factor was especially emphasized. This indicates that even when already dedicating a set time frame to engage in prototyping, more time should still be allocated in order to learn effectively from such approaches. This could suggest that this aspect (the time needed to engage effectively in learning from prototyping) tends to be underestimated. In addition, there are some inherent tensions between these factors that should be noted. For example, a heterogeneous team has a higher chance of having different ways of thinking, as the different institutional logic that underlies each participant's mental model will come to light and may lead to challenging assumptions that are entrenched and otherwise invisible within one's own department. However, this also leads to more possibility of conflict and less possibility of congruence, such as mentioned by Bapuji and Crossan (2004) regarding cognitive diversity vs. clashing logic. This may suggest that this is another reason more time might be necessary in order for a heterogeneous team to first become congruent. Another example is the need for clarity of expectations as mentioned by one participant, i.e., to know how much time they need to dedicate to the project. However, this is conflicting with the idea of learning as an open-ended process that would be hard to predict in advance how much capacity is required in order to effectively learn-by-doing in the prototyping. Furthermore, experiential learning would also suggest that the learners have to be the one to decide that, as it would be difficult for project management to be able to decide or predict in a "top-down" manner, how much learning needs to be done or how long that would take.

In addition, those factors raised by Schindler (2003) in project-based learning assume that organizational learning will occur once "knowledge from projects" has been documented at the end. However, this doesn't match the idea of learning as a continuous process, and does not account for course-corrective behaviours through iterative learning. This contradicts the statement from one participant that noted the necessity of reflecting on and evaluate past experiences to see what could be learned from them (corresponding to the reflective observation, abstract conceptualization of Kolb's ELT) and to document the lessons learned throughout the process (see Appendix C4: June 27 workshop - Selected survey responses, p. 140). Furthermore, there is a prevailing notion that assumes just "documenting" is enough, whereas my observation showed that just having a place to store "lessons learned" is insufficient¹⁴. In fact, the role of social processes in the *construction* of knowledge is not well-represented, as social processes are mostly seen as a means to *share* knowledge with each other. The question would be then, if knowledge is only documented (By whom? For whom?), at which point does this knowledge become embedded in the mental models of the individuals and the teams? And how does it then get diffused into the organization if this knowledge is specific to its context?

14 In this case, I was the one who (of my own accord) suggested and created a page in April to document the "lessons learned" since no such page existed and participants were discussing what they had learned in a project meeting without documenting them. However, other than the first entry added by me from the meeting, no other entries were added (likely, most project members forgot about the page as it was not embedded in their work process). In November (at the end of the prototyping phase), the deputy project manager hoped to "re-activate" this page by officially requesting project members to enter their experiences and lessons learned. I adapted the page per his request and will be planning and facilitating the lessons learned workshop at the end. This aligns with my prior work experience regarding the unmet promise and challenge of merely documenting "lessons learned".

What can be learned from the Plan phase?

Diversity of conceptualizations

In summary, the findings from the Plan phase illustrate that the conceptualizations of learning within the project vary widely, in line with the conceptual diversity and lack of clarity in academia (Armitage et al., 2008; Chiva & Alegre, 2005; Loeber et al., 2009). This could also be due to the epistemology of each individual, reflecting their mental models. However, as Chiva and Alegria (2005) argue, within organizational learning, the difference in epistemological perspectives leads to a different understanding of what is learning and by which mechanisms learning takes place. As theories diffuse from academia into practice, practitioners may not see the contradiction between engaging in practices recommended from both the cognitive-possession and social-process perspectives. For example, the actions of establishing communities of practices (based on the social and situated theory by Wengers; Li et al., 2009) vs. documenting lessons learned in a database (based on Nonaka's influential theory on Organizational Knowledge Creation, 1994). Given the limitation in time and resources, teams seeking to improve project-based learning and enable organizational learning will need to decide where the focus should be placed. Project members who hold different theories of learning may run into conflicts about how to best go about improving learning and not realize this conflict comes not from an operational question of "what should we do" but rather a deeper assumption and belief about "how do we learn". For instance, the paradigm of knowledge management common within the workplace implies a level of universality based on the cognitive-possession perspective (knowledge can be possessed, transferred, managed; (Chiva & Alegre, 2005). This would suggest a focus on documentation and development of knowledge management systems (lessons learned database, etc.). Efforts should be made to make that process smoother (e.g., use of technology as supporting tools). Alternatively, a social-process perspective would emphasize the knowledge construction process and instead focus on creation of shared meaning through social interactions, such as by creating more spaces for exchange and increasing the capacity of team members to become aware of their own mental models, as advocated in Senge's Fifth Discipline or in the 4I model (interpreting and integrating). Thus, conceptual clarity does have implications for practice. Awareness of different concepts may not resolve the epistemological conflicts, but from a pragmatic point of view, it may open the possibility of a more productive dialogue to find a shared basis of understanding for joint action.

If a certain level of congruence is necessary in order to improve project-based learning, then the necessity of social reflective practices as spaces of joint meaning-making (in particular, negotiation) is further warranted. However, this might be a challenge, given that most participants tend to adopt the more conventional idea of knowledge management that emphasizes documenting and sharing tacit knowledge, as opposed to the social process of constructing knowledge through meaning-making. In addition, it is conceivable that certain conceptualizations of learning itself are problematic in terms of enabling project-based and organizational learning. For example, if one team member believes that learning best occurs through training programs, they might be less comfortable with the trial-and-error approach employed in the team. It is also possible that the idea of "learning happens regardless" is part of the explanation of why there is a lack of explicit focus on learning in the project, as it is assumed to happen automatically as a result of doing. This is where the conceptual focus on "learning for what" could be beneficial. Not just the goal of learning (such as becoming more skilled practitioner), but what is the ultimate *aim* for this learning? In the case of learning to enable strategic renewal at the municipal administrations (transforming governance approaches), certain specific

characteristics of learning must then be included. For example, the importance of reflecting on one's underlying assumptions and the process of joint meaning-making are important elements of learning that are under-represented in the conceptualizations of the project. This suggests that even if project team members will learn new skills and new methods, it may not be sufficient to lead to the new ways of working and thinking that they (at least the project management) envision.

Methodological observation, reflection and lessons

Transdisciplinary vs. Participation as research “subjects”

As mentioned in the Methodology, the first workshop in May showed that I was too optimistic that a two-hour workshop would be enough to commit to one specific measure, even if it was just supposed to be a minor one that could be achieved within the time frame of the action research. Certain “overhead investment” (such as getting everyone on the same page) cannot be avoided even when reducing the scale of the intervention. Without a clear, explicit focus on learning and the learning structure within the project, there was a variety of different ideas on what were the key problems for learning within the project and how they can be addressed. This reflected my own underestimation of the diversity of ideas about learning within the project team, as well as the implications of such a diversity. After consulting project management and my first supervisor, I decided to re-purpose the next scheduled meeting to continue gathering data instead of implementing the measure, which led to an extended Problem Definition and Planning phase. In this decision, I relegated the participants to be research subjects rather than co-researchers, whereby their participation is only of a consultation role (Schneider, 2012, p. 156). In this role, they could provide input, but were minimally involved in the design and all decisions for the research are still made by me. At that point, I was not in the office often (and in fact many of my colleagues also regularly worked from home), so I lacked the regular contact with them in order to gauge their interest. In retrospect, I question whether the decision in June to “cancel” the original intervention-based plan was appropriate. I mostly worked with the project manager in making these decisions, which in hindsight could have been done differently, as it became clear that the interest and perspective of the project manager is not representative of the participants. I unilaterally decided (based on my estimation) that the team did not appear to have enough capacity to engage in action research. In an ideal world, I should have tried to come to that decision with more participation from them, but I had felt that I was already taking up too much of their valuable work time and assumed that they did not want to be bothered by such trivial matters. However, I think our assessment of the participants' willingness to be involved in the process was entirely incorrect. Given some personnel shortages, many people were stretched thin and probably did not want to take on additional workload for an external, voluntary task of “co-designing” the process and experience.

Group discussion as data collection method

As outlined in the Methodology section, survey responses were collected prior to the group discussions. The purpose of the group discussion was to enable shared meaning making through the interaction. However, group social interactions run the risk of not providing an accurate picture because of social dynamics such as the loudest voices drowning out the quieter ones, hence the individual surveys were sent in advance to mitigate this, as well as serving the dual benefit of having the participants come prepared for the session (having already done some individual reflection in advance), as a way to mitigate the time restriction. How did this method of data collection affect the data collected? One observation was that although individual

responses vary widely, there was not much discussion and debate about the individual contributions from each person. Does this imply that one could have a cumulative, integrative approach to the concepts of learning whereby each idea of learning can be accepted and are complementary to each other? This can suggest that most participants were on the same page generally, and that each contribution added one piece of the puzzle that all fit together. However, it is also possible that this is a methodological issue regarding the structure and process of the group discussion. For example, as mentioned in the feedback for the workshop in June, the time was too short to have enough time for discussion and there was the pressure of generating an outcome (the exercise with the Conceptboard) at the end of the hour, so the participants likely felt pressured not to raise dissenting opinions. This was given as feedback at the end of the session, “the conflict between ‘there is no more time’ and ‘you are all so quiet’”(Appendix C5: June 27 workshop - Selected workshop outcomes in Conceptboard , p. 141). In addition, as there were no actual consequences for the discussion (as opposed to the first workshop where an agreement had to be reached), there was less incentive to raise disagreements with the priority or perspective of another participant as that would be an unnecessary social risk. If the aim was to understand the different opinions that the individuals in the project hold, it might have been better to have the individuals rate the factors on their own or to conduct individual interviews. A group discussion could still have been productive to analyse the process of constructing shared meaning through the social interaction, or to analyse the role of power or social dynamics in the discussion outcome, however, due to time constraints, I did not end up pursuing this analysis. In terms of informing practice, this discussion may have provided a space for the participants to reflect on what was important for learning (in their opinions) and to learn how others in the project perceive it, but without the next steps to be taken, it remains a “theoretical” discussion that has no direct impact on practice.

Additionally, one observation of the role of social reflective process though can be noted from the June workshop. During this workshop, participants were asked to rate the enabling factors of learning in terms of the level of influence the project has on that factor, as well as its efficacy in enabling learning, and then to place that factor on the matrix accordingly. After participants individually moved their cards to the position that they found appropriate (prior to the discussion), a few participants moved it again while presenting to the group (without interaction or feedback from the group). In fact, they did it as they were verbalising their thought process, showing the effect of the process of externalising or communicating on one’s thought process on one’s thinking (relating to the concise depiction from Hilden and Tikkamäki, 2003): “How do I know what I think until I see what I say?”

Act: Group reflection session as intervention

The Act phase signified a return to my original plan of implementing an intervention. This phase was preceded by an unplanned “Study” phase, whereby I went back to the literature after some preliminary evaluation of the data gathered in the Plan phase. In the literature, I refined my understanding of learning through prototyping through the lens of the analytical framework described in the Literature Review section, which indicated the importance of reflection, particularly group reflection and dialogue. Given that this corresponded to my participatory observation and data from the participant and it is possible to implement within the scope of the master’s thesis, I decided to design and implement this intervention with the participants.

This phase addresses the research questions in the following way. It offers a triangulation of data from the observation of the current situation (context information) to the observation of reaction of the “system” when an intervention is introduced (“You cannot understand a system until you try to change it” (Schein, 1995, p. 12). In other words, by introducing an intervention to address some of the challenges of project-based learning, we can observe what else is missing or revealed as deeper challenges. In other words, if lack of time to reflect was an issue perceived by the participants, and reflection was perceived as an important element from the literature, then, what can be learned about hidden challenges if some time and focus on learning was made available through the implementation of the group reflection session?

Challenges in the design and implementation of a group reflection process within the prototypical phase

Here, I will briefly describe the challenges that I encountered while working with project management in order to implement a group reflection process. This data is thus collected from my perspective as the process designer and facilitator. The participants’ reactions to the intervention are captured in the next subsection under Observe.

Challenges during design and planning of the intervention

Having identified from the literature review that a group reflection process could be beneficial to the team’s learning process, I started by asking project management what plan was in place to approach the learning process from prototyping. I then shared my idea of re-purposing the scheduled August meetings to conduct these group reflection sessions and asked for input and feedback, since I wanted *co-design* these sessions (from the tenet of action research). However, it turned out that there were not yet plans to address the learning process as that is seen as something that would be done at the end of the prototyping phase, and I was told that there were no specific ideas about how that should look like at this point. Given the circumstances, I offered to do some preliminary research and did the planning on a potential design for the group reflection process that would be tried out. To allow for transparency and co-determination from project management, I documented the thought process for the design decisions and shared it with the co-designers, the moderator and the deputy project lead, and requested for feedback (see Appendix B3: Intervention design decision documentation - reflection-in-action, p. 130). For example, key decisions included: Who should be invited to the reflection sessions? How should the reflection session be structured?

However, the co-designers did not have time to read the information and did not provide feedback prior to the planning meeting. Decisions that had to be made were done ad hoc, out of necessity, and without much space for deliberation. For example, the deputy project manager decided to exclude one of the participants of the prototypical phase because of his estimation that this individual may not be able to contribute much to such a reflection session, since this individual is very technically-oriented. Although I could see where his assessment is coming from, this raises the question of criteria for participation (who decides and how?) and the question of “learning by whom” from Armitage et al. (2008). In addition, there was some apprehension and scepticism raised prior to the sessions, whether there would be enough engagement from the participants, revealing some assumptions about the willingness to learn in the group. This is not completely unwarranted, given that the topics for reflection were all provided by me, revealing a lack of engagement in the topic of learning or reflection from the participants (not a thematic work concern). Originally, I provided a list as

examples of possible topics, to provide a narrower focus for the sessions as a mitigation of the time constraint. In the end, despite asking for more ideas, I only received one additional suggestion.

In the design of the intervention, I referred to several sources for inspiration and guidance on how to structure such a reflection session, many of which have contradictory advice. Whereas some are simple and formulaic (based on the cognitive-possession perspective of just “documenting lessons learned”; (see, e.g., Dingsøyr et al., 2007; North & Kumta, 2018; Schindler & Eppler, 2003), others questioned the possibility of “managing” reflection or imposing any structure (Boud et al., 2006; Vince, 2002). This resulted in a rather arbitrary mix of questions selected for the reflection process (see Appendix B4: Questions for the intervention, p. 131, for the sources for the questions). For example, the inclusion of questions such as these from Smyth (1991 as cited in Smith, 2009, p. 42) in particular: “What do my practices say about my assumptions, values and beliefs? Where did these ideas come from? What social practices are expressed in these ideas? What is it that causes me to maintain my theories?” I decided to include these questions based on the premise of Mezirow’s (1990) perspective on the role of *critical* reflection in learning, especially transformative learning. Although I did not really expect this to be very promising, I judged it as not having a high risk to include these questions since this was an exploratory process and I wanted to keep the possibility open for a deeper, more critical reflection session if the participants were open to it. Of course, the trade-off was a more cluttered list of questions than a more stream-lined or simple one.

From this process of designing the group reflection practice as part of this intervention, the following challenges can be outlined. Although it is conceivable that many of these aspects would remain a challenge even if it were implemented outside of the framework of this intervention.

Table 21: *Challenges that Arose from the Design Process of the Group Reflection Session*

Challenge	Description
Difficulty in participant selection	Who should be involved in the group sessions? What criteria will be used to select the participants? Who decides?
Lack of time or prioritization	Who is responsible for the design and implementation of such sessions? What to do if project management does not have the capacity to do so? How to design a session to allow for productive reflection if there is not enough time dedicated to it, i.e. participants do not have time to participate?
Difficulty in structuring the session	Should it be structured? How should it be structured? Who should decide on the goal for the session or the underlying perspective?
Difficulty in topic selection	Should there be a specific topic for the reflection? Or should it be open? How should it be decided?
Trade-off on the choice of method	Whereas online meetings allow for lower-threshold for participation, they run the risk of having distracted participants and less fluid exchanges than an in-person meetings
Assumptions about participants’ willingness to participate	A few of the co-designers seem unsure that the participants will have anything to talk about, which could be a challenge in getting these sessions in place if there is no <i>perceived</i> need or openness for it

It should be stressed that these were challenges as *I perceived* them throughout the process of designing these interventions. Yet, even though these were challenges from my own experiences (as someone slightly external to the project team), I believe these would be questions that the project team would need to grapple with and address if they decide to create more spaces for social reflection processes. And the overarching question would then be: How should these decisions be made? Who decides how to decide?

Challenges during implementation of the intervention

As mentioned in the Methodology section, this method of the group reflection session was implemented three times: One as a test-run or pilot to test the method generally, then a second iteration, followed by a mini-session in order to bring a participant up to speed who missed the first two sessions. During the implementation of the reflection sessions, several additional challenges or tensions could be observed.

Lack of time or prioritization – Depth vs. frequency

Without enough time allotted for the session, there was no possibility to probe deeper into leaps of abstraction made in the session and to question or challenge underlying assumptions that others have aired. In particular, without enough time, there may have been airing of different assumptions, but there was no resolution into shared understanding. For example, in the first session, participants mentioned the need to be more reflective about the decision-making or more specifically about the rating process to select the use cases for the prototypes. This was summarized by the moderator as one of the learning outcomes from the discussion, “when we make a decision, we need to be very aware of what impact it has and what the goal of this decision is” (M1, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 58:24, own translation). However, they did not deeply question some of the underlying assumptions regarding decision-making that were implied, such as the technocratic idea that decisions should be left to “experts” and not “politics”. On the other hand, it was simply not feasible to ask for more time from these participants due to their schedules. Empirical studies have shown that allocating time for learning is hard enough (Schindler & Eppler, 2003), to allocate time just for the reflective portion is just as hard if not harder (Raelin, 2002). Although the project team might have been able to engage in a workshop for a slightly longer time given enough prioritization, it raises the question of feasibility for the long-term, especially the trade-off with frequency. Is it better to have deeper conversations infrequently (e.g., once a quarter / once a year), or smaller, more superficial conversations more frequently as it is easier to fit into the schedule (e.g., embedding it into regular Jour Fixe meetings)?

Role and competence of facilitator: External vs. internal

The role and competence of the facilitator can have two potential implications. First, in addition to general, neutral moderation, an understanding of the context of the concrete experiences would lead to a smoother discussion. For example, in the first session, the moderator was more familiar with the topic and process that the participants were reflecting on (internal to the process), so there were no misunderstandings regarding the discussion. In fact, she could even add more understanding of the situation by bringing in her own interpretation of the project experiences. However, having a moderator internal to the process increases the risk of the moderator being biased and not neutral. In the second session, the moderator was not involved in the process that the participants were reflecting on (external to the group), which led to a few

misunderstanding, such as regarding the topic of discussion (see e.g. Appendix C7: Aug 15 Reflection session - Selected passages from the transcript, p. 147, timestamp 44:00). Second, each session had a different moderator because of availability issues, so each moderator was using the method and process for the first time, which affected the quality of the reflection sessions. This was unfortunately unavoidable, but consistency would have allowed for more familiarity with the method. In case of an external facilitator (from outside the organization), it is even necessary for trust-building and to establish rapport. However, realistically, it may be difficult to organize a consistent engagement with an external facilitator that can accompany a project throughout its project period.

Difficulty in documenting the results – Free-flow vs. documentation

My assumption was that such discussions should also be documented to some degree in the session to allow easier following of the session. That is, participants will have something to refer to throughout the session and afterwards. Both moderators agreed with me, but for different reasons, e.g., to keep the participants active and avoid being distracted (due to the use of an online meeting). In the first session, participants were asked to write down their own thoughts, which slowed down the discussion as sometimes it was hard for participants to remember what they said and also as they are writing down their thoughts after commenting, they are less able to keep following the discussion. However, in the second and third sessions, there was an additional role of a note-taker in order to alleviate this pressure on the participants. The discussion was indeed more fluid, but there was no reference made to the contributions of the scribe, such as correcting or confirming how it was documented, which means the scribe also plays an important role in the interpretation and construction of the knowledge from the session. This is partly a process issue that can be resolved, such as incorporating time within the discussion to review what has already been said (can be done by the moderator), however that was just not feasible given the length of the discussion. Furthermore, it is questionable whether the documentation of the results in its “raw” form at the moment can bring much benefit to the daily operations of the team, as it is not embedded into any change in routines or practices.

Difficulty structuring and in picking a topic to reflect on: Structured vs. open

A semi-structured approach provided a frame to facilitate the conversation, such as through the use of the guiding questions to start the dialogue. However, it also imposed a certain artificial order on the conversation that could hinder the learning through reflection. For example, participants often mentioned things in all quadrants within one comment, and then having to fit it into the structure of the process led to disruptions of the conversation flow. Similarly, picking certain topics allows for a certain focus, but takes away the open-ended nature of the reflection. This is mentioned by Boud et al. (2006, p. 165): “This illustrates the dilemma for those who wish to intervene. We need to recognize that both formality and informality are needed for reflection, and that we cannot readily prise these features apart.”

What can be learned from the Act phase?

How do the specific challenges encountered during the design and implementation of the reflection session contribute to our overall understanding of the challenges faced in learning through a prototypical approach in a project environment?

Ownership - Whose responsibility is it to ensure that the project team learns from doing?

Ownership from the team was lacking in the design and implementation of these group reflection sessions. This is because the group reflection sessions were seen as *my interventions* for my research, as opposed to being part of *their* learning process. Of course, this is partly due to the circumstances. Given that this is for my masters thesis, the project team likely saw it as my responsibility to design it in a way that would fit my desired outcome so as not to jeopardize my research. But despite my repeated expression of openness for their feedback and engagement, there was not much interest in participating in the shaping of the intervention process itself (somewhat expectedly). Feedback was provided as requested only during the last few minutes of the session that I allocated specifically for that purpose. Even the co-designers (moderator and deputy project lead) provided little input for the design of the session, although they provided targeted feedback as requested or as necessary (e.g., for the moderator to determine a suitable moderation approach). Beyond the context of this study, it is also an interesting question in a project that has flat hierarchy, given the tension between “bottom-up” sharing of decision-making power vs. expecting that it is just the responsibility of project management to focus on learning. How should decisions regarding the design of the process be made? For example, regarding participant selection, there is a tension between inclusion (including everyone) and efficiency/efficacy (only choosing those who are most relevant or appropriate for the session). In this case, who should make the decision? Should the participants themselves decide? Or project management? Both approaches have their advantages and disadvantages. In fact, according to Faller et al. (2020), there are different types of reflection session based on the goal and the theoretical perspective that underpins the design. But whose goal or perspective is this based on? Given that the team lacks congruence in their conceptualization of learning but does not actively participate in the design by providing input, how can participation be anything other than by name only (consultative participation). How does that affect the quality of the reflection and learning?

Methodological observation, reflection and lessons

I anticipated many of the challenges, but I was unable to avoid or mitigate them. For example, given that the two possible moderators were not available in the last session, I was unsuccessful in finding another moderator, so I had to act as moderator myself. This was difficult not just to balance my dual role as moderator and researcher, but also there were some misunderstandings due to my German language skills. In addition, I was operating within the time constraints of my original research design, and despite trying to reduce the scale of the reflection sessions, it was still not enough time to delve deep into assumptions. Furthermore, the training of the participants was a limitation. Specifically, prior to trying out the method based on the idea of critical reflection from the perspective of Senge (1994) or Mezirow (1990), I knew it was necessary to incorporate more than a short introduction of the idea of airing assumptions and dialogues in the social construction of knowledge. These could be new concepts to the participants, given that it is not part of the conventional idea of *documenting* of lessons learned. This is especially true if it requires making the participants aware of their own mental models of knowledge and learning. For instance, in “The Reflective Practitioner” by Senge, a skilled facilitator is necessary, such as in his example of the charismatic Chris Argyris, in making the participants aware of the existence of mental models and the importance of

noticing and questioning them. However, due to time limitations of the sessions, I could not elaborate on these concepts.

Due to all these methodological limitations, in the end, it is hard to determine what are challenges that are only applicable to *this specific process* due to methodological weaknesses, or what are limitations of the concept of social reflective practice generally. Furthermore, despite my attempt to include practitioner knowledge in the design (and not just theoretical knowledge from the literature), this was not really possible due to time constraints from high workload, leading to a lack of prioritization from the co-designers. In the end, I could only address the “rigour” of methodology by documenting my reflection-in-action for transparency of the process, which can be seen in Appendix B3: Intervention design decision documentation - reflection-in-action, p. 130).

Observe: Role of group reflection session in learning process

Due to the nature of this intervention, a large part of the Observe phase occurred during the intervention itself. Specifically, it was not possible within the constraints of the thesis to collect observations of the diffused impact from the group reflection sessions on the learning process. Thus, the findings here only serve as a proxy for the actual learning outcomes of the sessions. Actual changes of behaviour or practices as a result of these sessions were not evaluated within this study, although certain preliminary observations were included at the end.

As described in the Literature Review section, my assumption is that group reflection sessions are crucial elements of learning, both in transforming experiences to learning in the learning-by-doing approach (per Kolb’s ELT, 2015), and in relating individual to group learning and potentially to organizational learning (according to 4I model or Team Learning per Senge, 1994). How did this play out in reality? Bearing in mind the challenges mentioned in the Act phase and its potential implications on the quality of the group reflection sessions, what can we observe from the sessions?

Overall, by reflecting on their experiences in a group, participants were able to share their own interpretations of their concrete experiences. This process then allowed the team to integrate each other’s perspectives. This was necessary in order to then formulate and agree upon decisions that require commitment from the team in order to change. Thus, the group reflection sessions provided a space for participants to engage in joint meaning-making of their experiences from the “doing” in learning-by-doing. In addition, these sessions provided an opportunity to practice their reflective skills in order to establish the conditions for dialogue. Finally, the group reflection sessions allowed participants to engage in reflection on their learning process itself, the “learning” part of “learning-by-doing”.

The findings from the intervention are thus presented according to the following thematic structure: the role of the group reflection session in joint meaning-making, in training reflective conversation skills, and in reflecting on learning.

Space for joint meaning-making: Collaborative transformation experiences towards learning

Engaging in a group reflection session offered an opportunity for participants to disclose their opinions and interpretation of the events (sharing concrete experience and reflective observations), construct knowledge through the discussion on what can be learned from it (abstract conceptualization), and finally lead to congruence on the next steps necessary on based on this joint meaning-making (shared narrative of future active experimentation necessary to integrate these learning outcomes). Documentation of these outcomes can be seen in the Conceptboard of the workshops, which is included in Appendix C10: August reflection sessions - Conceptboard documentation (all workshops) on page 154.

My observations of joint meaning-making are outlined in Table 22 below.

Table 22: *Joint Meaning-Making as Outcomes of Group Reflection Sessions*

Type of outcome	Examples
Sharing individual interpretation of events	<ul style="list-style-type: none">• Sharing emotions, opinions, recollection, motivation behind past behaviours and practices• Sharing individual interpretation of the causes of problems
Questioning past/current processes	<ul style="list-style-type: none">• Questioning how decisions should be made (who has the right, for what purpose, how, etc.)
Constructing shared meaning of experiences	<ul style="list-style-type: none">• Construct the knowledge gained from doing, e.g., in terms of the unknown unknowns that are now apparent in hindsight (conflict between expectations and reality triggered by doing)• Creating the shared narrative of the benefit of the prototypical approach (agile, innovative, etc.)
Creating the narrative of the benefit of the social reflective practice	<ul style="list-style-type: none">• Sharing positive experience, leading to increased motivation to engage in more in the future
Creating joint commitment for future action	<ul style="list-style-type: none">• Decision to change approach with the Steering Committee regarding the selection of use cases• Decision to re-evaluate the use of Jira as a collaborative tool

Note: For example quotes illustrating these outcomes, please see Appendix D5: Examples of Joint Meaning-Making , p. 159.

In addition, different types of reflection can be observed during the sessions. The findings are illustrated with example quotes below regarding the selection of use cases for the prototypes. Specifically, in reflecting on the problem that the selected use cases were seen as less appropriate for the goals they had in mind originally.

Table 23: Example Outcome of Group Reflection Session categorized by Mezirow's Object of Reflection

Object of reflection per Mezirow (1990)	Question asked at this level	Example quote
Content reflection (leading to single-loop learning) <i>Review of the way ideas have been consciously applied in strategizing and implementing each phase of solving a problem</i>	How can we improve the evaluation matrix for a better selection process of the use cases to be presented to the steering committee?	“The basis must be right, i.e., an evaluation matrix must have a foundation, and if I do it properly and have a clear definition of the goal beforehand, then it will be appropriate” (P6, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 59:58, own translation).
Process reflection (leading to double-loop learning) <i>Examination of the problem solving approach with a view toward the procedures and assumptions in use</i>	Should political decisions even play a role in the selection of the prototypes? Why should the “political level” have a say vs. specialist experts?	“On the topic of involving the political level. I also don't really think anything of it, but I know that was necessary at one time [...] so one simply has to prepare for it accordingly, i.e., the use cases that are available for selection must all have no danger or no relevance for any other technical decisions, but should, as it were, only to give the appearance of a decision-making possibility” (P5, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 31:54, own translation)
Premise reflection (leading to triple-loop learning) <i>Questioning the very presuppositions attending to the problem to begin with</i>	How do we know how the decisions should be made in selecting a use case? Did we have a correct understanding or underlying assumption to begin with when we engaged in the use case selection?	“At the time, so we went ahead in such a way – let me paint a picture...We wanted to build a washing machine and our approach was, we can take anything that is part of a washing machine, and we started, with a foot below and we started with the cover. And that's how we started, because our approach was - it doesn't matter which use cases they are, we will form our whole picture from many use cases. So that was for me the learning effect, that we now see that this approach was simply productive, if one does not define what is representative. At that time, we did not have the topic of representative use case at all, but a completely different approach” (P6, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 41:43, own translation).

Generally, both content and process reflection were observed, although the majority is within content reflection, matching the expectations from the literature. Although reflections on all levels are presented here, I did not otherwise observe many instances of premise reflection. In fact, I am unsure if the premise reflection depicted here is correct. In particular, there was a discussion around the evaluation process, questioning if decisions made via evaluation matrices are really more “objective” or “neutral” (by putting a “number” to it), or if it is pseudo-scientific anyway because all evaluations are based on the subjective rating of the rater (see, e.g. Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142 timestamp 59:10 - 1:01:30). Can this be considered premise reflection given that they are questioning the underlying assumptions with which the original question (how can we improve the evaluation matrix) was formulated? On the other hand, they did not fully delve into this discussion, or specifically, they reinforced the belief that the scoring system of an evaluation matrix can lead to a more objective (and thus accurate) decision as long as the correct conditions are available. Has this led to triple-loop learning and thus to transformative learning? This finding matches the literature, which suggests that this level of learning is rare, and in fact, it has been questioned whether public administrations are capable of such level of reflection, or if that can only occur at the political level (Gilson et al., 2009).

In summary, social reflective practices such as group reflection sessions can play a role in improving the iterative learning process within a project team by providing a space for joint meaning-making and for engaging in different levels of reflection on their experiences. This is especially beneficial in order to transform the experiences gathered through trial-and-error prototyping into learning, and in particular to construct a shared interpretation of these experiences as a basis for joint action in applying these learning outcomes into subsequent learning cycles.

Opportunities for practising reflective skills: Creating space for dialogue

As described in the literature review, individuals need to exhibit certain skills and teams need to practice together (see, e.g., Hilden & Tikkamäki, 2013; Raelin, 2001; Senge, 1994) in order to create the conversational space balancing the five dialectic dimensions (Baker et al., 2005). This would allow them to move consciously between dialogue and discussion in order to learn from social reflection towards team learning (Senge, 1994).

During the sessions, participants shared their interpretations of their experiences from the prototyping phase. To do so, different skills were utilized, as described by Raelin (2001), which contributed to creating the conversational learning space as described by Baker et al. (2005). The findings here illustrate the skills that were exhibited during the session and their contribution to the creating the conversational space via the negotiation of the dialectic dimensions described by Baker et al (see Literature Review section Figure 5, p. 31).

The skill of “Being” in negotiating the dialectic tension of Status vs. Solidarity

One key condition for these reflection sessions (often mentioned in the literature) is the atmosphere of trust, which Senge (1994) claims to require regarding each other as colleagues (based on the Bohmian condition for dialogue). This corresponds to the skill of “Being”, which Raelin (2001) describes as exhibiting behaviours such as “invite questions and comments”. For more examples of behaviours, please see Table 1 from Raelin’s article (2001, pp. 15-17).

In the intervention conducted as part of the study, this role was mainly played by the facilitator due to the pre-scheduled, structured form of the reflection session. For example, she started the process and opened the space for dialogue by inviting comments, as can be seen below:

And if I could just ask all of you a direct question right now. What was your experience with the selection of the prototypes, the selection of the use cases for the prototypes. A) Are you satisfied with it? Are you satisfied with the result? Are you happy with the process? Where did issues arise? (M1, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 22:02, own translation)

This was also prefaced by the input I provided as a process facilitator at the beginning of the session (see Appendix B5: Input for the intervention regarding dialogue for the information I presented), where I briefly clarified the notion of dialogue per Senge (1994) and the conditions necessary, including the atmosphere of trust and respect.

Although most of the literature emphasizes the need for an atmosphere of respect without hierarchy (see, e.g., Senge, 1994), Baker et al. (2005) argues that some level of positioning (status) is required in order for the participants to take initiative. Otherwise, in the extreme of “Solidarity”, conversation would lose direction. In this study, this was demonstrated by the selection of the reflection topic for the second reflection session. Due to the differences in preferences by the reflection participants, there was a long discussion (10 minutes out of a 1-hour session¹⁵) on the topic that would be most productive to discuss. Finally, the participants required the “positionality” of the deputy project manager to make a decision.

P9: And the three of you should to decide, for example, ‘that is the most urgent to us’, or...
P2: The topic of cooperation could also potentially be the alternative {...} I don't know. It all makes sense, actually it's....
P5: Then you have to make a decision, Christof.
P9: I agree, because in terms of content, I can't. You are the project leader, or specifically the deputy. Where do you feel we could get the best output, the most important output?
P2: Well well well, then I would go for collaboration or..vision..
P9: No, no “or”, stop, no....
P2: Okay, then let us discuss collaboration.
P9: Can the others live with it? [others nod]
(Appendix C7: Aug 15 Reflection session - Selected passages from the transcript, p. 146, timestamp 24:30, own translation)

This exchange demonstrates that the skill of Being can, to some extent, be enhanced by some level of status to provide direction for the reflection session. Status here should be understood as a dynamic element of the conversation, not necessarily the hierarchical position in the organization. For example, the status of the moderator, mine as process facilitator and the deputy project manager using this status to decide on the topic all serve to create the type of “shared, peer-like kind of leadership and facilitation” (Baker et al., 2005, p. 422) that can facilitate the conversation.

The skill of “Disclosing” in negotiating the dialectic tension of Individuality vs. Relationality

The skill of Being then opens up the space to allow for “Disclosing”, which Raelin described as exhibiting behaviours such as “(disclosing) one’s feelings at a given moment, based on what has transpired” and

15 Not including my input at the beginning and the fact that this was planned for 1.5 hours but due to a scheduling mishap, became a 1-hour session

“(presenting) one’s story to reveal the depth of one’s experience” (2001, pp. 15–17).

This was used by participants in the reflection session while describing their perceptions and interpretation of the concrete experiences, such as when they shared the emotion and opinions they held of the process. For example, one participant voiced his opinion about the decisions that were made in the project, stating:

I considered that to be wrong. I think it's wrong to make the decisions politically, and it's nothing more than a political decision when a steering committee makes the decision. A steering committee who, first of all, has no idea about technical and specialist matters, and secondly, who doesn't understand the vision because it's not there. An important basis for decision-making is simply not there. (P6, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 26:59, own translation)

Participants also exhibited their Disclosing skill when sharing their own reflective observation of what they perceived to be the issue or the cause of the issue (their own interpretation of the event). For example, this participant further explained his interpretation of the cause:

It wasn't just time pressure, but there was also a change in personnel on the part of the project management, and there was this thinking barrier (*Denkschranke*): we are not developing the idea (*Vorstellung*), we have to let a company show us (how to think). That was the guiding principle at the time, and it was also lived out in the selection of prototypes. That was explicitly desired by the project management, period. That's why I thought little of the project at that time. (P6, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 34:20, own translation)

How is this related to the dialectic tension of individuality vs. relationality? As Baker et al. (2005) argues, “The tension between individuality, where a person takes in life experience primarily as a separate entity, and relationality, where life is experienced as connection with others, can be described as an intersubjective process whereby an individual maintains a sense of self while at the same time is aware of, and open to influences of others (Hunt, 1987; Jordan, 1991)” (p. 421). In fact, the act of disclosure is in itself the act of navigating the tension of individuality vs. relationality, as team members could create space for learning by sharing their own perspectives, exploring the perspectives of others and genuinely trying to understand their differences. This corresponds to the idea of “suspending” their assumptions “as if in front of them” as mentioned by Senge (1994, p. 225). Participants did not necessarily have to give up their individual preferences and beliefs (in dialogue instead of discussion), making it potentially easier to listen. However, this requires an additional skill not mentioned by Raelin (2001) that Senge referred to as “listen to the listener” and “observe the observer”, in order for the team members to become aware of their own perspectives in interpreting the comments by others as well as comments made by themselves. I did not observe many instances of this additional skill in the reflection session (at least in explicitly raising and questioning the assumptions of others in the team), as underlying assumptions behind comments were not really challenged or explicitly brought to light. Furthermore, as this skill is part of the individual reflective capacity, it does not necessarily need to be verbalized and is therefore hard to observe.

The skill of “Probing” in negotiating the dialectic tension of Apprehension vs. Comprehension

Related to the disclosing of feelings and opinions by certain individuals, others may use “Probing” to further understand what was disclosed (or to encourage disclosing). With the Probing skill, Raelin (2001) describes as exhibiting behaviours such as “(asking) about one’s impressions and perceptions” and “(inquiring) about

one's attributions of others' behaviour" (p. 17).

This skill includes the inquiring of one's impressions and perceptions, which could include creating the space for more understanding through apprehension ("an immediate, feeling-oriented, tacit, subjective process"; Baker et al., 2005, p. 416) and comprehension ("a linguistic, conceptual, interpretative process"; Baker et al., p. 416). This can be observed from the quote below from the moderator:

Okay can you be more specific about why? ...Because you felt that your views ignored with the rating? Or because you felt like...(M1, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 24:18, own translation)

However, it is notable that limited Probing can be observed from the sessions other than by the moderators, which suggests that the dialogue session included more advocacy (of one's own position and thoughts) than inquiry (of each other's perspectives), and the roles that the participants took were more passive because of the engagement of the moderator who facilitated the session. This could be because Probing has to be done very tactfully when it concerns the sharing of feelings and opinions, to avoid conflict or discourage Disclosing. Although the team appeared to be able to share opinions openly with each other, it could still be uncomfortable to probe too deeply.

The skill of "Testing" in negotiating the dialectic tension of Epistemological Discourse vs. Ontological Recourse

Raelin (2001) describes the "Testing" skill as asking the following questions and exhibiting the behaviours such as "asking if the group would be willing to test some taken-for-granted assumption". On the other hand, Baker et al. (2005) describes epistemological discourse as "the linear, forward movement and naming of ideas and concepts generated in conversations. Ontological recourse softens and deepens that trajectory with recursive, cyclical reconsiderations implicit to iterative learning" (p. 418). By asking the group to re-evaluate its own processes, the skill of Testing may be able to create the space between these dialectic extremes by re-considering the assumptions and ways of thinking behind their actions (ontological recourse), which can then lead to an epistemological discourse in uncovering new ways of thinking. This recursive and discursive process of conversations is also crucial to the integrating and interpreting phase, in terms of feed forward and feedback between the individual and the team.

This skill can be illustrated in the following segment:

I always have the feeling, and that was certainly the attempt in this evaluation process, that one tries to bring in a certain objectivity...neutrality into the process. But sometimes it's just so pseudo-scientific...that's not really possible if one is not yet able to break it down into numbers. That means, you have to discuss, exchange...listen to the internal expertise, before you can start to make a pseudo-scientific process out of it, because otherwise there are some ratings, numbers, just based on wrong assumptions (P2, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 56:53, own translation).

In this example, the airing of the assumption behind their behaviour in the use of the evaluation scheme (that it brings objectivity) brought into question the process of evaluation and asked the group to re-consider its process, in essence *testing* the assumptions behind the use of the evaluation matrix. This is connected with the move from reflective observation (recursive) to abstract conceptualization (discursive) of Kolb's ELT.

Furthermore, certain topics seemed to have a recursive element during the session, such as the question regarding the tension between the work streams (between use case and technical ones). This can be seen in Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 48:03.

The skill of “Speaking” in negotiating the dialectic tension of Reflection vs. Action

Raelin describes the “Speaking” skill to include asking questions such as “What is emerging in our collective consciousness that I can articulate?”. Thus, participants can engage in Speaking to try to “re-construct” the experience as expressed by other participants in a way that is not necessarily personal, as a construction of “what happened”, in order to provide a collective basis to discuss, moving towards an element of integration of the experience.

For example, in response to the Disclosing of a few participants regarding their interpretation of the experiences, one participant engaged in Speaking to create a shared understanding of the team experience.

I tried to reconstruct it briefly from the end of the process...what actually happened..., because what happened is definitely, in the last step – the steering committee...selected two out of four use cases, and before that we had selected four that we presented to them...And somewhere there something got lost. (P2, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 27:43, own translation)

Within abstract conceptualization and active experimentation, more integration started to happen as more Speaking skills were employed to create a shared understanding of the future action that is necessary. For example, when thinking of active experimentation (the “Now What”) of the Reflective Learning cycle based on Kolb’s ELT, a participant stated the following:

That was thus the quintessence, that we said what we wanted to learn from it, when one makes a decision, one must always consider at the same time - what is the effect, what are the consequences and what is actually the goal of this decision [...] And that with the evaluation matrix, that was such a result, where one said that we should have taken more steps, more iterations, in order to come to a good result. (P4, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 1:13:20, own translation,

In summary, these findings suggest that group reflection sessions can provide a basis for training skills that are necessary to enact important process conditions for an effective reflection process. Additionally, one key factor that can be observed is the crucial role of the facilitator who holds the context of dialogue as mentioned by Senge (1994), especially in their use of these skills to create the conversational space. This shows that the group reflection session offered the opportunity for the team to *practice*, an element that he considers crucial for teams to engage in learning.

However, it should be noted that I did not explore whether there was conscious movement between dialogue and discussion, given that the structure used for the reflection session did not distinguish them. I did not observe any instances of explicit examples from the participants mentioning these differences. In addition, my depiction is not meant to be an authoritative categorization of the elements. Each element can be seen as interrelated and overlaps with one another. For example, Disclosing could also be seen as a way for negotiating between apprehension (sharing feelings) and comprehension, and not just between individuality and relationality. Further research could explore the relations and enhance the categorization.

Time to pause: Reflecting on learning

Generally, participants expressed positive feedback regarding the reflection session and found them to be useful (see Appendix C8: August 29 workshop - Selected survey responses , p.149). In particular, they found the structure to be helpful and “dedicated time” to reflection that was provided, especially with regards to the learning process from the prototyping approach.

For example, even though most participants expressed satisfaction with the learning that has taken place due to the prototyping approach, one participant brought up a question whether they have “overloaded” the prototyping phase with too ambitious learning goals (see Appendix C9: Aug 29 Reflection session - Selected passages from the transcript, p. 150, timestamp 27:23). That is, the notion (also brought up by other participants) of the steep learning curve in the project. This is somewhat related to the tension between exploration of new knowledge vs. exploitation of existing knowledge that was introduced by March (1991). In fact, Choi and Chandler (2020) mentioned the risk of knowledge vacuum due to having too many new things at once. However, in the conversation, the question was raised in response whether “underwhelming” would have been equally unproductive, especially for this group (see Appendix C9: Aug 29 Reflection session - Selected passages from the transcript, p. 150, timestamp 38:39). This relates to individuals’ capacity and motivation to learn – was it only because this group is particularly open as frontrunners that they would be able to learn well in this condition, whereas this is not transferable to other projects? Furthermore, when considering transformational or radical changes, it is hard to imagine that these would be possible with only incremental changes to keep the learning requirements manageable. For example, would it have been beneficial if they only experimented with *one* aspect at a time, such as using new digital tools, while using “classical project approaches”? Or if they only implemented the idea of prototyping phase, but did not work on use cases, the pre-commercial procurement process, would the approach have been helpful given that these new approaches sometimes need additional conditions for success? The group reflection session thus offered the opportunity to reflect upon some tensions inherent in the learning process, such as between “overwhelm” vs. “underwhelm”.

Furthermore, another topic that was brought up was the question of how learning can be measured. Even though many participants repeated that they learned a lot from the project so far and found the prototyping approach to be exceptionally well-suited for learning, one participant cautioned against overestimating the learning outcomes by conflating methodological learning with content-specific learning, since the “true test” of whether they have learned enough will be first shown based on the results of the major tender process that will begin at the end of this year (see Appendix C9: Aug 29 Reflection session - Selected passages from the transcript, p. 150, timestamp 20:17). According to him, only then can it be proven if what they have learned through the prototyping phase has been enough or sufficiently applied, naturally with some level of speculation on the counterfactual (how would this have been different if they did not have the experiential basis from the prototypical phase). This resonates with the argument from Leeuwis (2004, as cited in Loeber et al., 2009) regarding the importance of proper feedback to measure learning, but is a challenge in such situations where the learning goals are diffused and it is not easy to re-construct knowledge. This raises the question of whether learning progress should be documented in such approaches, and if so, how. Although there is a lot of documentation that has been done as part of the project on Confluence, it is already considered unwieldy by most project participants and it is difficult to review older materials to see “how far we have come and how much we have learned”, especially since the nature of a real-time, collaborative wiki

means that there is no “archive” view per se to gain an understanding of the historical development of the project knowledge and learning journey. Which means it might be hard to review and evaluate whether the learning was enough and to reflect on course-correcting for the future. This resonates with the debate in the literature as well (see, e.g., Easterby-Smith et al., 1999; Gilson et al., 2009).

In addition, in the last workshop on August 20, I asked the participants in the final evaluation of the process what they thought about the necessity of questioning assumptions in these group reflection sessions (see Appendix C9: Aug 29 Reflection session - Selected passages from the transcript, p. 150, timestamp 1:10:10-1:14:34). In particular, I asked if the questions meant to encourage critical reflection about their practices were necessary, given that these were mostly not addressed during the sessions¹⁶. In general, participants believe that reflection must still be “productive”, i.e., with regards to the cost-benefit analysis of time. For example, the time it takes to delve deep into assumptions and question the socializations that form these assumptions, compared with the benefits that the individual (or the team) can achieve from that reflection. As one participant states, “everything in moderation” (P8, Appendix C9: Aug 29 Reflection session - Selected passages from the transcript, p. 150, timestamp 1:10:10). In addition, it appears that there are differences in understanding the idea of underlying assumptions, where one participant interpreted it as “false assumptions we hold about other people”, that can be corrected via dialogue and learning about one another’s perspectives. Although this idea is also represented in the literature (see, e.g., Senge, 1994, pp. 177–175). This is not quite in line with the idea of underlying assumptions as meaning schemes (per Mezirow, 1990), i.e. as the way we view the world and our role in it. According to Mezirow, these assumptions need to be transcended through premise reflection if we are to be able to solve the problems that are caused by the current structures, given that how we view these problems are themselves problematic as they come from the same meaning schemes (the necessity for “paradigm change”). Unfortunately, due to the time limitation, I was not able to delve deeper into the topic, but generally, this finding matches the broad consensus in the literature that this type of learning (deep, critical reflection) is hard, for example due to defensive routines (Argyris & Schön, 1978) or distortions (Mezirow, 1990).

What can be learned from the Observe phase?

Change in cognition or change in behaviour?

The findings from the Observe phase suggest that social reflective practices, such as group reflection sessions, can play different roles in the learning process of project teams engaging in prototyping. The reflection sessions were positively received by the participants, and certain benefits seemed to be observed, such as joint meaning-making, practising skills for dialogue, and being more reflective of their learning process. In fact, there were mentions by several members that such sessions should take place more often, suggesting that these sessions add to the *experiential* knowledge of participants regarding the benefits and importance of such sessions. That is, the sessions enhanced their learning by raising awareness of this element in the learning process. However, whether this change of cognition is enough for team or organizational learning is open to question. For example, immediately following the second workshop, after the session (and recording) had officially ended, the moderator, the deputy project lead, another participant

¹⁶ One participant mentioned that some engagement with underlying assumptions did occur in the session, although I could not verify it as I did not manage to check his interpretation with other members and I personally did not see this assumption being raised and challenged in the session transcripts

and I had an informal debrief chat. It was mentioned again that the session was helpful and there was interest in conducting another session, given that it was difficult to only pick and reflect on one topic in that session. I encouraged this idea and expressed willingness to provide support, but that the process should be driven and owned by the project team and not be driven by me, due to my capacity constraints. Unfortunately, I did not hear about this anymore afterwards and this session did not take place, I assume due to capacity constraint from the project workload. Thus, if based on the definition that a lesson has only been learned if it has been implemented, then the mere change in cognition i.e. in realizing the benefits of such reflection sessions is not enough to say that the project team has “learned” the importance of conducting regular group reflection session to improve their team learning. This further emphasizes the importance of exploring barriers to implementing what one has learned, in particular to the process conditions within these sessions that may hinder learning from them.

Process matters: Getting to higher-order learning and integration

Despite the potential positive outcomes from these sessions, it can be observed that the process matters, as the implications of the challenges from the Act phase can be observed in this phase. Process conditions (e.g., lack of expertise, inadequate time) impacted the learning process, especially with regards to my objective of facilitating higher-order learning. As indicated in the literature review, many authors expounded on the necessity of critical reflection in order for the participants to achieve higher-order learning (Mezirow, 1990; Senge, 1994). This requires that reflection practitioners be able to become aware of and examine their individual and team assumptions and beliefs. However, from this study, it can be seen that three major challenges made this especially hard. First, without enough time for the session, there was no possibility to probe deeper into leaps of abstraction made in the session. Second, the competence of the facilitator likely played a key role in being able to bring these assumptions to the surface. Third, lack of readiness and training of the participant also likely contributed to this difficulty of questioning assumptions. Of course, these can be seen as process weaknesses of the intervention conducted in the study, as these challenges could not be adequately addressed. However, I believe these limitations (time, availability of skilled facilitator and readiness of participants) are somewhat generalizable as they are not easily overcome even outside the context of this research, given that a certain level of investment in the process is required. Typically, this investment is not available, as organizations tend to engage in functional documentations of lessons learned (if at all) and the focus is not on challenging deep underlying assumptions for transformation. This is not to suggest that no learning occurred during these sessions, but raises the question of whether the learning outcomes from functional group reflection sessions would be adequate for organizational learning for transformation.

Furthermore, from my participatory observation (in my employment engagement), I observed that several attempts to integrate these learning outcomes into the project were unsuccessful. For example, an attempt to revamp the use-case selection process for the contract tender (based on the learning outcomes from the first workshop) was interrupted and discontinued. Apart from project constraints (e.g., the individual taking charge of this process had limited time, as well as the tight deadline from the project), I observed that one important barrier to integrating the learning outcomes from these sessions was because of an unavoidable process limitation: the absence of the project lead in the first two workshops as he was out of office. He was not part of the team learning that occurred during these sessions and thus not fully aware of the intention to change project practices and processes. This suggests that the lessons learned from these dialogue cannot

easily be transferred to someone who was not present in the session. Instead, being part of the process itself is important for the learning. In addition, the role of the project lead in integrating the outcomes from these shared meaning-making processes is crucial for changes in project practices. Further participatory observations showed that participants from these sessions needed to advocate continuously for changes in the project based on their own interpretations of what the lessons learned were. Given the time constraint of the thesis, these are only preliminary findings regarding the role of these sessions in integrating and institutionalizing as per the 4I model. Further research is necessary to explore these processes in detail. For example, by exploring the factors that are important for organizational learning from these sessions, such as the role of direct participation in the group reflection, or the role of advocacy in integrating and institutionalizing these learning outcomes (Who advocates? How do they choose which of the learning outcomes to advocate? How does that affect what is actually integrated? What is the role of a leader in these processes?)

Methodological observation, reflection and lessons learned

Several unplanned process factors (specifically, constraints that were not part of the research design) led to noticeable difference in outcomes between the sessions (such as the presence/absence of the project lead, having a different moderator for each session, etc.), which contributed to a better understanding of the relation between process and outcome. However, it also raises the question of how valid these findings are, or if they are a fluke from the research process that is somewhat arbitrary due to the specific circumstances. For example, each session had a different moderator, were of different length, had different topic of discussion and had different participants. Thus, were they comparable in their outcomes?

Participants also reported that they appreciated the openness and willingness to share in these sessions, which they considered an important factor in its success (as noted by Senge, 1994, and other authors regarding the conditions for dialogue). However, this project already had a culture of collegiality (horizontal, participatory structure) prior to the reflection session. I was told is not commonplace within the silo-ed and hierarchal organization. To some extent this justifies the focus on this case study as a paradigmatic case, but raises the question on how generalizable the findings would be for other parts of the organization that are less receptive to the idea of change, or less motivated to learn new forms of working.

In addition, although the reflective learning cycle was structured to include the four phases of Kolb's ELT separately, and the discussion was originally structured with this in mind (going through each phase sequentially), participants tended to include comments encompassing different quadrants (e.g., reflective observation, abstract conceptualization, etc.) within one contribution. This is not too surprising, given that the reflective learning cycle was designed more for individual vs. group reflection on a more limited scope (reflecting on the learning process from a specific training program). In the group setting, as participants reflected on how they felt while discussing their concrete experience, they also considered and shared their thoughts on what could have been done differently (abstract conceptualization or active experimentation). This was not really a problem as the quadrants were supposed to provide guiding questions to jump start the reflecting and sharing process, and it was not necessary to follow the structure dogmatically, but it does raise the question regarding structure of the session (one of the challenges mentioned in the Act phase). To what extent do these sessions need to be structured and how should they be structured? How would the findings have been different had it been structured differently?

Section 5 - Reflect: Overall Discussion

Section 4 described the findings and analysis organized by the Plan, Act and Observe phases, corresponding to the Analytical Framework depicted on page 56. In this section, corresponding to the Reflect phase, I will take an overall view of the findings as a whole and attempt to synthesize how the findings presented in the different phases answer the central research questions. This is followed by a reflection on how this study fulfils the research objectives, an overview of the study's limitations, and recommendations for future research. I also include self-critical reflections and methodological reflections on the research as a whole, specifically from the perspective of the tenets of transdisciplinary, action-oriented research.

Putting it all together: How do the findings relate to the research questions?

First, I briefly outline how the findings and discussion contribute to the central research questions. This is summarized in Table 24 below and the following paragraphs provide some elaborations. As indicated in the updated Analytical Framework on page 56, the findings from certain phases contributed more to certain research questions than to others (based on the supporting research questions). However, the phases provide complementary contributions to each research question generally. Note that here I am not referring to the phases of the research process (as indicated in Figure 6 and Figure 7 in Overall design, p. 48), but specifically to the phases of the Findings and Discussion section, as presented in the updated analytical framework on page 56.

Table 24: *Synthesis of Findings from the Phases in Relation to the Central Research Questions*

Central research questions	Phase	How do the findings from the phases contribute to answering the research questions?
RQ1: What role can learning-by-doing project approaches play in enabling organizational transformation in municipal administrations?	Plan	<ul style="list-style-type: none"> Contributed primarily to conceptual understanding for all three research questions (from literature review) Provided empirical data (participants' perceptions) to address the research questions (primarily RQ1 and RQ2, but also complementary data for RQ3)
	Act	<ul style="list-style-type: none"> Contributed primarily to experiential knowledge on the challenges of learning, primarily addressing RQ 2 and RQ 3 Complementary contribution to RQ1 by providing some idea of the limitations of learning-by-doing project approaches
RQ2: What can be the major challenges of learning through such approaches for the project team?	Observe	<ul style="list-style-type: none"> Contributed primarily to RQ3 through observations of some outcomes of the group reflection sessions and its relation to the learning process
RQ3: What role can group reflection sessions play in enhancing the learning process of such approaches?		<ul style="list-style-type: none"> Complementary contribution to RQ2 by deepening the understanding of the impact of some challenges on the outcomes, which then provided complementary contribution to RQ1 by revealing some boundary conditions and limitations of the role of such project approaches in enabling organizational transformation

Plan

Findings presented in the Plan phase as well as the Literature Review section provided the foundations for the study by contributing to the *conceptual understanding* of the phenomenon under research (the role of learning-by-doing” project approaches in enabling organizational transformation in municipal administrations), potential challenges of such approaches and the potential role of social reflective practice in enhancing the learning process. This was primarily done through the literature review to address the supporting research question 1.1. However, this understanding was also enriched by the participants’ conceptualizations (of learning and of key factors to learning in such processes) presented in Section 4 in the Plan phase, which provided complementary contribution to RQ2. Responses from the participants also showed that, although social reflective practice was not mentioned specifically, the need for such an intervention was supported by related and similar comments (complementary contribution to RQ3).

Act

Building upon this foundation, findings from the Act phase deepened the understanding of the phenomenon under study through the experiential knowledge gained regarding the challenges to learning from such approaches (RQ2), especially with regards to the design and implementation of the social reflective practice (RQ3). For example, the difficulty in getting more time for the session (revealing lack of prioritization as a challenge) or how to make decisions with regards to the structuring of the session (e.g., who should make the decisions?) This complemented the understanding of RQ1 by providing some idea of the limitations of project-based learning approaches in enabling organizational learning.

Observe

The findings from the Observe phase primarily address RQ3 by illustrating the roles that a social reflective practice such as group reflection sessions can play in the learning process. This also provided a complementary contribution to RQ2 from a more evaluative perspective. For example, whereas in the Act phase, the challenges that arose while designing the process were described (such as not having enough time), the Observe phase provided some empirical observations on what was the outcome or impact of this challenge (such as not having “deeper” reflection). Thus, the findings here provided some empirical evidence of the implications of the challenges identified in RQ2. This simultaneously suggests some boundary conditions to the role of social reflective practices in project-based learning. Consequently, this enriches the answer for RQ1 by providing some limitations to the role that these learning-by-doing project approaches can play in transformation. That is, it is not only a question of *how to diffuse* the project-based learning into the organization (through integration and institutionalization) but also whether this learning is enough to achieve the transformational potential if underlying assumptions within individuals, groups and the organization are not challenged as part of the learning process. This question will be further explored in the following section.

Summary of key findings: How this study addresses the research objectives

How do these findings and the study as a whole address the purpose of this research? The purpose was to increase our understanding of the role of project-based experiential learning in organizational learning, especially regarding the potential challenges and possibilities to improve the process. This is important to be able to increase the capacity for municipal administrations to engage in organizational transformation through organizational learning, which could in turn lead to more effective adaptation of governance approaches to ones more suited to the current realities. In order to do so, the research aimed to address the research gaps by exploring the potential role of learning through prototyping as a project approach in enabling organizational transformation in the municipal administrations, to explore the challenges to learning from such approaches and possibilities to improve such learning processes.

Potential role of learning through prototyping as a project approach in enabling organizational transformation in the municipal administrations

“Learning-by-doing” as a concept is gaining popularity within the public sector, especially in projects in municipal administrations that are related to technology. This is often seen as necessary because the world is complex and technology changes rapidly, therefore it would not be possible to solve problems only by “learning by studying” in advance and then developing the “perfect solution” to be applied. This study starts with the assumption that organizational learning is thus important because this way of thinking and working is in contrast to many existing institutional logic within municipal administrations. From the literature review, the conceptualization of organizational learning towards change of governance approach indicates that a deeper kind of learning is necessary (as compared to ‘acquiring’ skills and knowledge to ‘work more flexibly’). This is because changing their way of working (e.g., being more flexible vs. deliberative) requires changing their way of thinking (e.g., in re-imagining their role in urban governance). This suggests that in order for municipal administrations to engage in organizational learning to change their governance approaches, learning needs to be viewed as a social process that involves reflecting on underlying assumptions and engages in system-thinking. Project teams can act as generative learning space for that purpose, by providing opportunities for individuals to learn from their project experiences and integrating it into team learning, and then institutionalizing it into the organization. Experiential learning as a project team can be enhanced through group reflective dialogue in order to engage in joint meaning-making for future action.

Based on this understanding, group reflective dialogues were facilitated as the intervention for this action research in the DATEN:RAUM:FREIBURG project. From the interventions, shared meaning-making through interpreting could be observed. Examples of integrating (changing team practices) could not be observed within the study, although participant observation from my employment shows this to be mixed. However, examples of questioning and challenging underlying assumptions and beliefs (double-loop and triple-loop learning) could not really be observed. This raises the question if this project-based learning from prototyping is enough to lead to the organizational learning that is necessary to transform the municipal administration’s governance approach. Without questioning the deep, underlying institutional logic (other than superficial statements such as the slow, bureaucratic nature of the “classic municipal bureaucracy”), it

may not be possible for deep transformation and continuous adaptation, as this requires reflexivity. On the other hand, to what extent can specific projects within the municipal administration challenge the dominant institutional logic(s), especially on the side? The mandate of this project is to implement and establish a data infrastructure, not to engage in organizational change and transformation (whose responsibility is housed within another department, the Main and Personnel Office). This means that the project participants may not be interested or willing to engage in the type of deep learning necessary (difference in learning goals and expectations), nor may there be support from top management to enable this type of learning. In fact, there might even be resentment at the overstepped jurisdiction, which often occurs in silo-ed organizations. Although using new tools (which is within the project's domain) may require some changes in ways of working, ultimately it is questionable whether changing in tools can sufficiently change the ways of working to the extent that it changes how we think. For example, is the acquisition of new skills with the agile method an accurate proxy for new ways of thinking? Would a municipal administration with employees who master these skills lead to increased capacity for governance, e.g., being more flexible and adaptable as an organization (as is the hope of some within the project)? Can project-based learning really include the higher-level questioning that is outside of the scope of the project but required as organizational capacity? For example, with this project, perhaps learning to implement a data platform effectively could lead to better planning of the Dietenbach neighbourhood using better tools (evidence-based decision-making), but can project-based learning accommodate questions outside its scope, such as to engage in the discussion of whether Dietenbach should be developed at all¹⁷ (which decision is better for the public good)?

This is not to suggest that learning from prototyping is not a helpful approach for project-based learning. Indeed, participants felt strongly that they learned from the process. In fact, it may be especially relevant technological-based projects where the technological solutions are still new and the corresponding expertise in the organization is still lacking. Prototyping thus supports exploration of new knowledge (per Crossan) in order to learn, as they can add to the experiential basis of the individual and allow the team to make better decisions (if individual learning is appropriately integrated). But can these “skills to be explorative and experimental” be learned and applied independent of context (i.e. outside of the project within their daily work?) What knowledge, exactly, can be transferred to the rest of the organization? In addition, such approaches are time and cost-intensive, and municipal administrations have limitations in resources to experiment. If this approach is at all able to contribute to the ultimate goal of organizational change through organizational learning, it would be necessary to have a better understanding of what are the challenges and how to increase the efficacy of these learning approaches.

Challenges to learning from project-based prototyping approaches

With regards to the empirical gap, most challenges with learning that were raised by the participants were found in the literature, corresponding to barriers to project-based or organizational learning, suggesting that even a learning-based approach such as an experimentation / prototyping approach is not immune to the same forces. Thus, the process of learning through prototyping, although new with relatively less empirical evidence, did not differ much from other project-based learning. One surprising finding that contributes to the population research gap is the paradox of the politics-administration dichotomy that was revealed. Although the rigid culture of the municipal administration was mentioned as a challenge (relating to the

¹⁷ The necessity and decision to develop the Dietenbach neighbourhood is a politically controversial topic in Freiburg, with sustainably-minded groups on both sides of the argument (Jens Kitzler, 2020; Reilly, 2019)

actors' agency vs. structure debate in organizational learning; Feldman, 2000 as cited in Olerjarski), the results suggest that there is actually a surprising amount of (at least perceived) autonomy. For example, participants rated it as within the control of the project to have enough autonomy for decision-making (not reliant on management). In fact, there is a clear opinion among the participants that decisions should be left to the experts (*Fachebene*) and not to the political/management (*politische Ebene*) level. This tension between the two levels was seen in the discussions and reflections regarding the role of the steering committee in the selection of the use cases for the prototyping phase. From the discussions in the workshops and from my participatory observations, project participants believed they can overcome this difficulty of learning by reducing the political influences, suggesting that the project is less influenced by politics than the literature would suggest (Gilson et al., 2009; Olejarski et al., 2019). This could possibly be due to the broad nature of the term "smart city" and the separation of role between the political/management level (focused on strategic questions) vs. the specialist expert level (focused on implementation). This was mentioned in an informal conversation with the Project Manager, who said that there is actually relatively a lot of room for manoeuvre (*Spielraum*) because the political level is not concerned with the day-to-day details of execution. Thus, the project team can determine their level of influence through the high-level narrative that the project team markets to the steering committee. This could be conducive for project-based learning, given that autonomy facilitates learning when the degree of exploration required is high (McGrath, 2001). Although this could be seen positively within the organization if there is more autonomy for the employees (bottom-up, participatory vs. top-down from the management), it raises the question of whether this is a technocratic view that is contradictorily less conducive to participatory governance approaches. Even within the project team, there is a tension in the underlying beliefs between groups regarding the inclusion of the citizens as end users. Essentially, it raises the question of whether experts or politicians in the municipal administrations best represent the needs and views of the citizens (or whose responsibility is it to engage their direct participation in municipal projects). This is a topic that warrants further investigation if municipal administrations intend to engage in organizational learning through these innovative projects in order to change their governance approaches.

Time is not enough

By engaging in an action-oriented research approach, I was able to delve deeper into the challenges in learning. Although "not having enough time" is constantly mentioned as a challenge to learning (also in the literature, such as by Schindler and Eppler, 2003), the findings from this study suggest that, on the other hand, just having the dedicated time to learn via prototyping is not enough. For example, despite having the prototyping phase set aside, there is a lack of clarity on what is considered learning (by project participants) and consequently, lack of alignment on what needs to be learned and who owns the learning process. By providing the time to reflect via the intervention, the action-oriented approach provided a deeper understanding of the challenges beyond the "usual suspects" (e.g. time, motivation, discipline, lack of conducive environment, etc.) In addition, the findings reveal some tensions inherent in such learning process itself that presents a challenge to learning. These key themes on the challenges to learning are elaborated below.

Lack of conceptual clarity: What are we talking about when we are talking about learning?

The findings from the Plan phase suggest that conceptual clarity of learning is not merely an academic concern. While practitioners may not necessarily be interested in philosophical debates on which learning perspective is better, the diversity of unexamined concepts of learning nonetheless have implications on practice. For example, if project management's idea of learning is focused on instrumental learning (how to use new tools and apply new methods) and they hold the cognitive-possession perspective that such learning can be done via knowledge transfer, then the plan to facilitate that learning is very different than the type of learning process necessary to change one's mental model in order to re-evaluate the governance approach of the municipal administration.

Although it is probably not possible (or even necessary) for epistemological consensus in practice, the findings suggest that it may nevertheless be helpful to unpack the concept of learning in order to distinguish what is referred to when referring to learning. Thus, project teams, especially those engaging in learning-based approaches (e.g., experimental approaches) should ask the who, what, why, where, how questions regarding learning: Who is (supposed to be) learning (e.g., individual, team, organization)? What should be learned (procedural knowledge)? Why does it need to be learned (to be skilful practitioners? To create organizational change)? Where and how should it be learned (informally? Structured? Social interactions)?

These questions cannot be answered on a one-off basis and then documented and saved somewhere, but rather it would be a continuous engagement with them, in "living" the process of answering them through practice. Different types of learning are not necessarily mutually exclusive, although it is unclear if they can be mixed and matched arbitrarily in any given context, especially given differences in underlying perspectives between positivistic vs. constructivistic conceptualization of learning as noted by Chiva and Alegre (2005). However, given limited time and resources, teams pragmatically have to agree on the most effective approach suitable for their needs and be aware of the difference of each conceptualization. This may require both dialogue and discussion, where project members first air their assumptions about learning to share their interpretations, and then engage in discussion to determine the best path forward, integrating it into team practices.

Two key questions here are: What types of knowledge does the project want to focus on? And what types of learning are necessary for that? This is also a fundamental question to consider in order to determine how to measure learning, which would be necessary in order to improve the learning process. A review of the types of knowledge was out of scope of this research, but just as the concept of learning can be further unpacked, relatedly, different types of knowledge such as "recipe/know-how" knowledge vs. "ways of seeing the world" (e.g., mental models per Senge, 1994; or theories-in-use per Argyris, 1995; or meaning schemes and meaning perspectives per Mezirow, 1990). The statement "I know learning is important" can either mean "I understand that learning is important" (abstractly, as a concept, because someone explained it to me), or "I have personally experienced the importance of learning" (the implications of this statement is clear because I have experienced it), or "I live in such a way that I prioritize learning" (congruence between action and belief, i.e. *truly* understanding the implications of our knowledge by behaving in accordance to these beliefs). I was not able to explore the question of "what is knowledge?" within the research, although it could be fruitful to more deeply examine the types of knowledge and its relation to types of learning (see, e.g., Bolisani & Bratianu, 2018 for some review on knowledge). For example, project members reported that they

“know” learning is important, but that they were not able to focus on it. Is this a difference between theories-in-use and espoused theory? Or a question of actor agency-structure? Although a full exploration of this behavioural gap is not possible within this study, findings suggest it could be because of conceptual blurriness with learning and knowledge, but also potentially due to lack of or unclear ownership of the process, which is described next.

Lack of ownership: Who is in charge of learning around here?

The findings, especially within the Act phase, reveal another challenge to learning through prototyping in project teams: the ownership of the learning process. On the one hand, this relates to the conceptualization of learning in terms of who learns and how do they learn. For example, if individuals are seen as the central component of enabling learning, then they should be seen as the ones holding ownership of the process (individual-driven) and other actors could only support the process, such as by providing a conducive environment. On the other hand, project team members may view team learning as the central component and place it within the ownership and responsibility of project management, leading to a conflict in expectations. Furthermore, taken-for-granted assumptions that learning would happen regardless would lead to a lack of ownership of the learning process, since this would be an automatic process not requiring ownership. These different ideas of ownership of learning can be traced in the evolution of thinking regarding learning in the workplace, e.g., the idea of “training” to “productive reflection” (Boud et al., 2006). In addition, it relates to the problem of agency-structure (Olejarski et al., 2019), that is, whose responsibility is it to remove the barriers to learning? If learning is an individual-driven process, are they responsible to address the structural barriers to their learning (such as lack of conducive organizational culture for learning)?

Armitage et al. (2008) also stress the importance of asking: Who gets to participate in learning? Who decides on what type of learning is desirable? How is this decision made and who is excluded? In addition, Elkjaer (2004) argues that organizational learning requires the negotiation between the individual’s need and interest in learning vs. the organization’s. This implies there is at least some sort of struggle of learning goals. A trickier question is: What if individuals have no interest in actively shaping their learning process (for whatever reason, e.g., capacity constraints) but management wants to implement a bottom-up, participatory approach? Is that then not a paradox if a participatory approach is imposed top down with requirements to participate in the decision-making for the learning process? For example, my calls for collaboration were mostly not answered and there was no strong desire from the participants to engage actively in shaping the process themselves. The main reason cited by the project participants during the Plan phase (the challenges they perceived) seems to be a lack of time, although even the project manager is cognizant of the fact that if it were important enough, they would prioritize it. This suggests rather that the lack of time stems from lack of prioritization, which is in line with the findings from Evans et al. (2021) that learning is not prioritized enough (not set as explicit goals but just seen as means to the goals or something on the side).

Tensions with learning and reflective practices: How do we know how to negotiate the trade-offs?

Armitage et al. (2008) states that, “In any individual or group learning situation, difficult trade-offs are inevitable. Learning is more than a collection of techniques and structures” (p. 94). The challenge of determining ownership of the learning process is important because learning requires making decisions on

trade-offs. As the findings (especially in the act and observe phases) indicate, there are tensions inherent in the learning process that cannot be resolved in one extreme or the other without either hindering the learning process or leading to a trade-off. For example, the tension between efficiency vs. transparency (involving only key stakeholders based on some self-determined criteria vs. involving every stakeholder) or the tension of overwhelm vs. underwhelm (challenging project with steep learning curve vs. incremental learning well within the team's capacity) in facilitating learning. Negotiating these tensions is not something that can be solved a priori, in a context-independent manner (e.g., through some best practice guidebook). As with other complex problems facing municipal administrations, the decision on how to learn also includes navigating these persistent tensions. This is also mentioned by Boud et al. (2006), that "creating capacity for reflection at work involves the legitimizing of the third space between conventional polarities. That is, between the life world and the system world, the formal and the informal, the structured and the emergent" (p. 167).

In fact, the tension between action and reflection inherent in learning (described by Kolb, 2015, as the dialectic tensions of transformation via intention vs. extension) is one that organizations, teams, and individuals grapple with the most. How do we prevent paralysis from the extreme of reflection without action (or the meaninglessness of a change in cognition if not accompanied by a change in behaviour) while not being so engaged in action as to not have the time to think? This was mentioned by the project teams in the final evaluation of the intervention, with their criteria for determining the "right" amount of reflection to be based on whether it is productive for practice. However, how to define and measure the productivity of a reflection? Depending on how it is defined, it could fundamentally be at odds with the concept of critical reflection per Mezirow (1990). For example, critical reflection takes a lot more time, commitment, and has the highest risk (challenging deep, underlying assumptions towards transformative learning is often painful). One could come to a conclusion that this is at odds with the group or organization, creating friction that reduces the productivity of work and one's performance. Is this not "productive" then? And even if it were perceived as still productive (for some larger goal) – can organizations really afford this level of time commitment vs. a quick session to gather lessons learned for the sake of checking a box, as this is more easily measurable as productive, compared to something as intangible as changing mental models and institutional logics.

Reflective learning: Learning to reflect on learning for improved learning

As part of the research process, the potential benefit of social reflective practice was identified and tested in the intervention that was implemented: the organization of the group reflection sessions. The findings suggest that these sessions can play an important role in enhancing project-based experiential learning through enabling joint meaning-making, training reflective conversation skills, and by providing the space to reflect on learning. However, when taking the findings of this study as a whole, and considering the goal of project-based experiential learning towards organizational transformation, this intervention needs to be part of a larger, more holistic approach.

As a whole, this study's findings correspond to those by Evans et al. (2021) in their studies of urban innovation projects that, although process learning is identified as a key outcome of the projects, it rarely receives explicit treatment, as it is assumed to happen. According to them, "process learning involves learning to experiment more effectively and embedding new processes into organisations to enable them to

change how they engage with cities. Capturing such learning is hard (which is why it has not been done), but important” (Evans et al., 2021, p. 179).

In fact, one particular form of process learning is *learning to learn*. This requires thinking about and reflecting on learning: the process and its outcome. This can be referred to as reflective learning, or “thinking about the way one learns” (Reflective Learning, n.d.). However, it should be noted that this term is often conflated with learning through reflective practice, i.e. learning by reflecting on your actions (Moon, 2004). For the sake of clarity, I will refer to it here as reflection *on* learning *for improved* learning. In other words, it is an explicit focus on the learning process as the object of reflection. In the case of municipal administrations, it would be reflecting on the learning process that is necessary to change their governance approaches.

This can include reflection at all three levels of learning – individual (e.g., reflecting on one’s own learning style to acquire the skills necessary in new approaches to governance), team (e.g., reflecting on and constructing a shared conceptualization of project-based learning in innovative projects), as well as at the organizational level (e.g., reflecting on and evaluating the structures in place that facilitate learning towards organizational transformation). The objective is to continuously reflect on the processes of learning in order to be better at learning (increasing capacity to learn), as well as to reflect on the goal of learning in relation to the outcomes (is what we are learning what we wanted to learn?) For example, this focus on learning includes raising questions such as “can reflection be meaningfully organized?” Beers and van Mierlo (2017) cautions that “the mental and communicative activity of (re-)considering knowledge, ideas, assumptions and values is too uncritically seen as something that can be organised, facilitated and planned and moreover, as something that might directly promote relevant change.” Therefore, more *critical reflection* on learning and its potential is necessary.

Unfortunately, my findings indicate the need to increase the focus on learning (surely not something that practitioners are unaware of), without being able to provide specific recommendations on how to do so (the “how to” that practitioners are interested in, in order close the knowledge-practice gap). However, one possible method worth exploring is the methods within Reflexive Monitoring in Action, established by van Mierlo et al. (2010) based on theory and practice. These methods are meant to monitor system innovation projects that aim to contribute to the sustainable development. Although its scope is different than organizational change for municipal administrations, it nevertheless provides a possibility to focus on learning through a flexible monitoring process. For example, certain tools can be used to focus explicitly on the learning itself (e.g., by incorporating a dynamic learning agenda that asks “how can we improve learning from the project for organizational change?”) In addition, other tools can be used to facilitate the learning process within the project, such as by conducting a timeline and eye-opener workshop to provide a space for the project participants to reflect on their learning experiences and to create a shared narrative of the project and their role in it. These methods are built for projects that are dealing with complex environment and have heterogeneous stakeholders, which corresponds to the conditions that municipal administrations face in changing governance approaches. It is outside of the scope of this study to evaluate the effectiveness of this tool other than based on speculation, but further research could look into this in detail.

In summary, these findings address the research objectives by contributing to the understanding of learning through prototyping as project approaches in enabling organizational learning in municipal administration.

Regarding the challenges in project-based experiential learning, several key findings emerged: the lack of conceptual clarity of learning, lack of ownership of the learning process, and tensions inherent within the learning processes. The implementation of the group reflection sessions as social reflective practice indicates its potential to enhance learning. However, just as merely dedicating time to prototyping does not mean one can effectively learn from it, merely having the time to reflect on the experiences is not enough. Instead, the findings suggest that there is a need to reflect on learning for improved learning. This could be achieved through dynamic, flexible approaches that allow for explicit focus on learning.

Limitations and future research avenues

Given the capacity constraint (time and competence) of this research, several significant limitations should be taken into account in the evaluation of these findings. However, this is partly unavoidable due to the exploratory nature of this research. Future research could build upon these findings and re-evaluate the empirical findings to create a more complete picture of the process of learning through prototyping in municipal administrations towards organizational change. In addition, a reflective note on the quality of this action-oriented research based on the action research tenets is included.

Limited sample size: Incomplete participant list

As Flyvbjerg (2006) mentions, there can be significant value in case-study research, especially in providing a rich understanding of the context in order to contribute to theory-building. However, the rigour and quality of the findings in this study is constrained due to the fact that not all project participants were involved. This is partly a reflection of the challenge of transdisciplinary research, as the participant list was agreed upon through discussion with project management. However, if I had insisted on including all project members, that would also have been accepted by the project management, but due to my own evolving understanding of the research, it was hard for me to articulate even to myself who needed to be involved for what purpose. Due to capacity issues, I was not able to conduct interviews with other project participants. This meant that the data was mostly generated from those who are more actively engaged in the project, especially in a leadership capacity (other than a few exceptions). Although this is still insightful information given that the learning process for the more active group would be most relevant, it nevertheless shows only part of the picture. In addition, not all participants were able to attend all the meetings, which changed the nature of the intervention process, although it revealed the importance of the process in shaping the outcome of these social interactions.

Future research avenue: Given these limitations, further research could include the entire project team and potentially other stakeholders in order to test the validity of these findings. In addition, further research could compare the learning process within this project with other similar learning-based projects within the Municipal Administration of Freiburg, or other projects with similar approaches in other municipal administrations in Germany, in order to gain insights from the similarities and differences of these contexts, such as the role of institutional settings, organizational culture, leadership, etc. in the learning process (Bapuji & Crossan, 2004)

Lacking insight into the role of contextual factors or individual factors: No inclusion of the role of feedback and feed forward loops

Although the group reflection and group discussions serve an important role for creating shared interpretation, due to capacity constraint I was not able to complement it with individual interviews, which may have provided a deeper insight into the unarticulated thoughts of the participants (what Argyris, 1995 refers to as the “left-hand column”), especially those who were quieter. This information would still have been very valuable to consider how effectively the interpreting and integrating process really happened, such as if the group had really come to a shared understanding of their experiences and the actions to take going forward. Without the insight into the individual, it is hard to evaluate the change in cognition from these processes, especially as the scope of the timeline did not allow for evaluation based on the change in behaviour. In addition, although the participants’ mental models and interpretations are formed from contextual factors, such as the social, historical, political context of the project, this study could not address those factors.

Future research avenue: Future research could address this methodological limitation by complementing the data from conducting individual interviews, as well as the collection of data such as reflective journal entries, in order to shed light on the role of these factors in the team learning process. In addition, follow-up research can study the diffusion of the learning outcomes of a project into the organization to understand the role of the project-based learning in the feed forward loop to enable organizational change. One additional research avenue that could be interesting would be the study on the diffusion of project-based learning outcomes through networks of similar projects, such as the Smart City Model Projects, across the boundaries of organization. To what extent can knowledge be “shared” if it is socially constructed? How does that social construction occur? Wenger’s concept of Communities of Practice (Li et al., 2009) may be well-suited for this study focus.

One-dimensional: Limited inclusion of different reflection settings

As part of this study, I only looked at the specific reflection sessions as part of the intervention introduced. However, as authors such as Boud et al. (2006) have mentioned, productive social reflection is not just what occurs during these formal or structured sessions. They also occur as part of existing work processes.

Future research avenue: Further research should include observations of reflection that are embedded in normal work process, especially the idea of reflection-in-action introduced by Schön, to examine the similarities and differences between structured and unstructured reflection and the role that each play in enabling team learning through experiences.

Connection between learning process and outcome: The proof of the pudding is in the eating

This study focused on the process of project-based learning through prototyping as an emergent process and its potential role in enabling organizational change, but this one-sided view of the process is only meaningful if combined with empirical data on the outcome. Did the efforts to improve the learning process lead to more effective project-based learning? Did this learning approach yield material transformation of the organization? As the learning process is a continuous one and the learning spiral requires action (active experimentation and a change in behaviour), this study can only be seen as addressing one part of the

process.

Future research avenues: Further research should thus ideally include a longer-term accompanying research of the project to study the following questions: Did the learning process within the project lead to improved capacity of problem-solving in conditions of uncertainty and ambiguity? To what extent does this improved capacity (if applicable) lead to institutionalizing learning processes that increases capacity for governance? What are the potentials instead of decreased capacity for governance (e.g., through slower decision-making, more uncertainties, wasted resources, etc.)?

Section 6 - Conclusion

Bearing in mind the limitations of this research, in this section, I conclude the thesis with a brief summary of the research as well as its potential contribution to research as well as practice. This research was based on the assumption that municipal administrations need to radically change their way of working and governance approach, if they are to be able to better tackle the complex socio-ecological challenges they are currently faced with. Organizational learning is assumed to be a crucial element for this organizational change and transformation to be possible and project-based experiential learning is identified as a possible pathway to organizational learning. From this motivation, the purpose of the research was to increase our understanding of the role of project-based experiential learning in organizational learning, in order to contribute to the facilitation of organizational transformation in municipal administration. In order to do so, the research aimed to address the research gaps by exploring the potential role of learning through prototyping as a project approach in enabling organizational transformation in the municipal administrations, to explore the challenges to learning from such approaches and possibilities to improve such learning processes. To achieve these research objectives, a research strategy incorporating elements of transdisciplinary action research has been used to study the DATEN:RAUM:FREIBURG project team within the Municipal Administration of Freiburg. Based on the literature reviews and empirical observations, social reflective practices were identified as important components of learning. Group reflection sessions were thus organized in order to explore the role they can play in improving the learning process and to understand the challenges that arise. Although key findings emerged as regards to the challenges: the lack of conceptual clarity of learning, lack of ownership of the learning process, and tensions inherent within the learning processes. The findings suggest that learning-based approaches need to have explicit focus on learning (such as through learning goals, etc.) in order to effectively learn, given the diversity in conceptualizations of learning. This raises the question: how could these learning goals be structured yet flexible, given the open-ended process of learning? One possibility could be the idea of reflexive monitoring in action proposed by (van Mierlo et al., 2010). Further implications for practice and research are outlined below.

Implications for practice

Given that this research was conducted in a specific context (DATEN:RAUM:FREIBURG project), relevant findings and context-specific recommendations will be shared with the project team after the submission of this thesis. By explicitly creating the time and space for learning through the establishment of the prototyping phase, the project signalled a high engagement in learning and risk-taking and aimed to create trust and transparency in a cross-departmental project. However, if their learning goals are to be achieved, more explicit focus on learning itself is necessary and it cannot be assumed to be a natural by-product of doing.

On a more general note, for other teams engaging in similar learning-based approaches such as learning through prototyping or learning-by-doing, some high-level takeaways can be abstracted and are outlined below. The learning process could be further improved by the following:

- **Define and align on what is learning** (in this specific context) – ask the “who, what, why, how, where, when” of learning. In particular, learning goals and expectations (*why*) might guide *what*

needs to be learned and *who* needs to learn. Some level of alignment is also necessary on the process – *how* they believe learning (should) occur, which might determine the *where* and *when* of learning.

- **Specify learning explicitly as project goals and track it** (not just as means to the ends of achieving project goals or by assuming it is something that happens automatically on the side)
 - Consider all three levels (individual, team, organization) of learning and the processes that connect them, e.g., intuiting, interpreting, integrating, institutionalizing if using 4I
 - These questions from Crossan et al. (1999, p. 534) can serve as guiding questions: “Do individuals have the motivation, understanding, capability, and opportunity to interpret their environment? How do individual and group experiences help to develop shared understanding? How well do individual insights become shared, integrated, and institutionalized in the organization? What impediments are there to integrating individual perspectives? Is there enough institutionalized learning? How does institutionalized learning facilitate or impede intuiting, interpreting, and integrating? What is the nature of the interplay between the feed-forward and feedback processes?”
- **Clarify responsibility and ownership of the learning process**
 - Related to the “who” of learning – it is also necessary to determine who decides how learning should be conducted – are the project members responsible for their own learning? Does project management own the process? What are the roles and responsibilities of each stakeholder?
- **Be reflective and dynamic – continuously review learning goals and outcomes**
 - Given that learning-based projects need to engage in problem-solving iteratively and that learning in these cases tend to be open-ended, it only makes sense that the learning process must also be iterative, requiring continuous evaluation of what needs to be learned (is this learning goal still valid? Are we approaching this learning process correctly?)
- **Consciously navigate the dialectic tension of reflection vs. action – especially find ways to incorporate social reflection (such as establishing it in the project practice and goals)**
 - As suggested by Kolb (2015) (and many other authors), reflection is necessary to transform experiences into learning, and in the context of the project, social reflection is necessary for team learning (Senge, 1994) through *interpreting* and *integrating* (4I model)
- **Develop the skills for critical reflection and systems thinking**
 - Develop competencies and create practice opportunities for critical reflection (questioning underlying presuppositions or mental models (Mezirow, 1990; Senge, 1994), e.g., in conversation, facilitating skills, etc. (Baker et al., 2005; Raelin, 2001; Senge, 1994)
 - Develop competencies and create practice opportunities for system thinking to reflect on agency-structure tension, e.g., learning to look at the interrelationships between the structures in which they operate and their own practices (Loeber et al., 2009)

In a nutshell, a structured yet flexible approach to learning is required in project teams engaging in learning-based approaches aiming to enable organizational learning.

Implications for research

Contribution to the field of organizational learning

As mentioned in the introduction (p. 13), this study aimed to address the empirical and population research gaps by gathering empirical data through this case study. This study thus contributed to research by providing a deeper look into the challenges of project-based learning for organizational change within municipal administrations in Germany, particularly looking into the relatively new phenomenon of prototyping approaches in these contexts. This was done by first exploring one way to conceptually understand this phenomenon. This understanding highlighted the role of group reflection sessions as important elements of experiential learning as well as organizational learning, which provided theoretical basis for the intervention conducted. Several key findings emerged as challenges from learning in such contexts: the lack of conceptual clarity of learning, lack of ownership of the learning process, and tensions inherent within the learning processes. The findings highlight the importance of reflecting on learning for learning, which indicates future research avenue in potential strategies to enable that in project teams, especially in municipal administrations. More specific future research avenues were indicated in the Limitations and Future Research Avenue section (p. 101).

Methodological learning for future research

Even though there is a call for more transdisciplinary, action-oriented research within the scientific field (see, e.g., Bradbury et al., 2019), my struggle with engaging in such approaches resonates with the evidence mentioned by literature (Dick, 1993; van der Meulen, 2011; Zuber-Skerritt & Fletcher, 2007; Zuber-Skerritt & Perry, 2002) that engaging in action research within the constraints of a master's thesis is challenging. This is especially true because this is not a dominant research strategy in university programs (Lang et al., 2012; Vilsmaier & Meyer, 2019).

I found it of utmost importance to have supportive supervisors, that is, that they understood the extra challenge of this approach. In addition, it was extremely helpful to have the support of the project team who was willing to accompany me on this open-ended journey of unclear destination. My struggle with the research meant that I often could not articulate what I was struggling with, much less what I was trying to do with the study, but both groups had the generosity of spirit and patience to work with me regardless, without which this would not have been possible.

Taking this approach made the thesis process a highly painful process for me¹⁸. But it is precisely through this pain that I learned a lot. Each individual must judge their own pain tolerance, but I can only say for myself that it was rewarding in the end to at least try to live my espoused theories (the epistemology and motivation for action research) and confront my theories-in-use to change them. For other students interested in using this approach for their master's thesis, I can only emphasize the need to find supportive supervisors and participants (ideally, co-researchers). In addition, it is important to check your motivations, know what you are getting yourself into, document your process, and embrace the discomfort. I have provided elaborations on each of these points in Appendix E: What would I tell other students considering this

18 On the other hand, it is hard to speculate on a counterfactual as there is no guarantee that a more conventional approach would have been less painful, as evidenced by experiences from other students struggling through conventional research approaches

research strategy for their thesis? (p. 161) for reference.

In a nutshell

By employing an action-oriented research approach, this study provided insights into the learning process of learning through prototyping by a project team within a municipal administration. In particular, it contributed to empirical and conceptual understanding of the phenomenon and the barriers to project-based learning and its role in organizational learning. This included experiential knowledge from the intervention to explore beyond what was found in the literature and in the participants' responses. In addition, some learning outcomes regarding the challenges of action-oriented research may contribute to methodological knowledge for other students considering this approach for a thesis. As a contribution to practice, the findings suggest the need for explicit focus on the learning process itself when engaging in such prototyping approaches, specifically the need to reflect *on* learning in the project (thinking about the way the individuals, team and organization learn). This suggests that, beyond the documentation of lessons learned (typical of the knowledge management perspective), a dynamic, flexible and reflective approach to learning is necessary. Given the limitations and methodological weaknesses of this study, further research could add to the understanding of the challenges in project-based experiential learning by including a more holistic view of related factors (such as barriers at the individual and organizational levels, socio-cultural factors) and explore the potential for strategies, such as reflexive monitoring in action, in enhancing the learning process in such contexts.

Post-Script: Self-Critical Reflections - The Quality of this Research Process and the Thesis as an Outcome

Given the limitations and methodological weaknesses mentioned throughout the thesis, the question is: How relevant and valid are these findings and my interpretations? As mentioned in the Methodology section, given the difference between action-oriented research and more “traditional” approaches, authors such as Zuber-Skerritt and Fletcher (2007) have provided certain tenets or principles as a means of evaluating the quality of action research within its own epistemological and ontological perspectives. Looking back on both the research process, findings and thesis as an outcome, how do I evaluate my intentions to adhere to the action research tenets vs. what I was actually able to achieve?

Naturally, I am aware of the pitfalls of self-evaluation. Evaluations are subjective. Despite this being my frank assessment, I do not claim that this will be an accurate evaluation, if accuracy is to be measured by how closely it resembles evaluations by others. For one, I am close to the subject (with all its biases and blind spots). For another, I neither have the experiential basis for evaluating these types of research nor have I grappled with the meaning of science and research with regards to measuring it. For example, what is a “sufficient” amount of practice-orientation for a master-level thesis? However, if only for the sake of being transparent about my own assessment, I have provided my evaluation below.

Table 25: *Self-Assessment of the Incorporation of Action Research Requirements per Zuber-Skerritt & Fletcher (2007)*

Requirements for action research (Zuber-Skerritt & Fletcher, 2007)	My evaluation of the incorporation of this element
Practice-oriented (improving practice)	I conducted three group reflection sessions that had a minimal impact on improving practice, mostly limited due to the conceptual confusion driving the research
Participative (including in their research all stakeholders and others who will be affected by the results of the research)	I only achieved a consultative level of participation mostly due to insufficient communication with all participants (not just project management) prior to the study, e.g., in gauging interest, clarifying ownership
Focused on significant issues relevant not only to themselves but also to their community/organisation or fellow human beings in the wider world	The role of organizational learning in municipal administrations is relevant to the wider world, although the role of through project-based experiential learning is only one minor aspect of it
Using multiple perspectives of knowing, triangulation of appropriate methods and theories, and connecting their own judgements to discussion in the current literature	I incorporated experiential knowledge and observations from the intervention, as well as practitioners’ perceptions through the surveys and discussions. However, I was not able to incorporate my participatory observation from the project context satisfactorily in the findings. I did connect my judgements to discussions in the literature review, although most to ideas of seminal work that were older

Requirements for action research (Zuber-Skerritt & Fletcher, 2007)	My evaluation of the incorporation of this element
Rigour in their action research methodology and creative, innovative, contributing something new to knowledge in theory and practice within and across systems	I was not able to ensure rigour (in my opinion) with my methodology and was not able to be systematic (mostly due to lack of experience with interpretive, action-oriented research), but I tried to be transparent about these shortcomings
Explicit about their assumptions so that readers and examiners may use appropriate criteria for judging the quality of their work	Assumptions are made explicit throughout the thesis where possible, e.g., in the theoretical perspective of knowledge (social constructivism), epistemology (interpretivism), etc.
Reflective, critical, self-critical and ethical	Relevant reflection notes from the research process are incorporated throughout the thesis, in particular to provide context on the quality of the data and interpretations of the findings. Self-critical assessment of the process is included in addition to evaluation of the limitations of the study

Overall, the lack of familiarity with interpretive action-oriented research led to methodological mistakes that certainly affected the quality of the findings. The mitigation suggestion by (Zuber-Skerritt & Perry, 2002) and Prof. Villsmaier (personal communication) to form an action learning group of other thesis students engaging in action research was not possible. Reflecting on the topic of overwhelm vs. underwhelm (as mentioned by the research participants) on my own process – was it better for me to have strove for something out of my comfort zone and thus produce a mediocre result, or to have worked comfortably within my zone and potentially produce a better outcome? In the end, the former is perhaps better for my own growth and development, if not for contribution to science or practice.

Research outcome: Quality of the thesis

Zuber-Skerritt and Fletcher (2007) suggested that the research process should be viewed as separate from the outcome (the thesis) and suggest that a quality action research thesis is one that:

- presents critical analysis of a well defined action research question/problem;
- investigates a significant problem or “thematic concern” or major issue in professional, organisational and/or community development – significant not only to the researcher(s), but also to the whole group, organisation or community who are affected by the problem and its solution;
- uses and justifies an appropriate methodology and methods (including participant confirmation and reflection diary);
- creates/advances knowledge in the field (practical, theoretical and/or experiential knowledge);
- provides convincing evidence for this knowledge claim;
- points to limitations and further research to be done;
- demonstrates how critical reflection has contributed to transforming knowledge and practices;
- communicates all of the above in a clear, logical, succinct and coherent manner;
- makes the results public in the thesis and where possible in published form through journal article(s), book chapter(s), a monograph, occasional paper and/or a book (p. 433)

Their list is only one set of criteria (as distilled by them from their literature review), and these criteria are rather vague and broad. This is beyond the scope or purpose of my thesis to engage on this point, but it does serve as a basis for my reflection on my outcome.

Generally, I can only confidently say that this problem is a significant concern in the community, that I have pointed to limitations and further research to be done, and that the results are made available in this thesis (which is not public). Whether my research problem was sufficiently well-defined, my methodology sufficiently appropriate, my evidence sufficiently convincing, etc. depends on the evaluator and the yardstick upon which I am evaluated. From my perspective, it could have been better, but I was not able to improve it within the circumstances. For example, the length of the thesis suggest that my writing is either not succinct enough or the research problem was too ambitious/broadly defined. I suspect it is the latter, since in hindsight, I realized it might have been better to focus on only one “golden thread”, such as “what is the role of conceptualizations of learning in hindering the learning process?” or “how do social reflective skills relate to process conditions of effective group reflection sessions?” This was not because I did not know I should do that (I was aware and was told that I should), but I simply lacked the skill to comprehend how to do it. With regards to clear and coherence communication, I wondered whether structuring the Findings and Discussion section as I did (with the Plan, Act, Observe) phases was justifiable. In retrospect, shouldn’t the challenges in designing the intervention be part of the Plan phase? And perhaps the Act and Observe phase should be combined? Ideally, I would have included observations from the effect of the interventions. For example, in what ways have the outcomes of these group reflection sessions led to observable impacts on the learning process (e.g., observable changes in cognition or practices). But this was not possible (time frame of the study, question of how to measure learning, etc.) and it was too late to change my structure at that point.

In the end, I could not contribute much to informing practice. With my preoccupation on what it means to have a theory-based or theory-informed research (and my futile exploration into what research means), I could not hold on to my original goal. Even being clear-eyed of my derailment off the original path, I could not course-correct. Ultimately, that led to a lot less time for “practical” contributions (though I hope to still be able to do that beyond the thesis). On the other hand, the contribution to research is also not particularly meaningful. For example, throughout the research and in writing the thesis I struggled with the *unit of analysis* which seemed conceptually unclear. For example, am I focusing on the learning from the prototyping itself (in which case I should be focusing on the prototypes that certain members of the project team was working on), or am I focusing on the learning-by-doing approach *during* the prototyping phase, regardless if that learning-by-doing is related to the prototype or not (e.g., methodological learning)? Although my intention is on the latter, I could not satisfactorily bring in clarity to the conceptual blurriness and untangle the meta-messiness, despite my best efforts. Consequently, this thesis (in both the research process as well as the outcome) has the problem of having a little of everything, but not enough of anything. This was a key problem that we were warned against in various scientific method guidebooks. To mitigate that, clearly-defined research questions were necessary. I tried to reconcile that with the interpretivist ideas of research without using interpretivism as a scapegoat for lack of rigour, but I could not manage to distill to one issue. If I were able to focus just on the practical problem within the project (the “practice”), I would have spent more time with the participants as part of action learning (and not action research). I believe that would have been more impactful for practice, but not contributed to research. Although I am at heart a practitioner and not a researcher, I can also see that it might have skewed more towards action and not reflection, and I would not have benefited from the literature review. Thus, even though I could do justice neither to action nor to research in my thesis, I still found the methodological learning process to be beneficial to me and have shared some reflections in the Appendix regarding the implications of these learning outcomes for students considering action research as a strategy for their master’s thesis.

References

- Adu, P. (2016, April 7). *Planning an Action Research*. <https://www.youtube.com/watch?v=x8af5k3qRRQ>
- Ahvenniemi, H., Huovila, A., Pinto-Seppä, I., & Airaksinen, M. (2017). What are the differences between sustainable and smart cities? *Cities*, 60, 234–245.
<https://doi.org/10.1016/j.cities.2016.09.009>
- Alagirisamy, B., & Ramesh, P. (2022). Smart sustainable cities: Principles and future trends. In I. Pal & S. Kolathayar (Eds.), *Sustainable Cities and Resilience* (pp. 301–316). Springer.
https://doi.org/10.1007/978-981-16-5543-2_25
- Alawadhi, S., Aldama-Nalda, A., Chourabi, H., Gil-Garcia, J. R., Leung, S., Mellouli, S., Nam, T., Pardo, T. A., Scholl, H. J., & Walker, S. (2012). Building understanding of smart city initiatives. In H. J. Scholl, M. Janssen, M. A. Wimmer, C. E. Moe, & L. S. Flak (Eds.), *Electronic Government* (Vol. 7443, pp. 40–53). Springer Berlin Heidelberg.
https://doi.org/10.1007/978-3-642-33489-4_4
- Albrecht, K. (2017, September 29). Have you experienced “Eureka” moments? *Psychology Today*.
<https://www.psychologytoday.com/us/blog/brainsnacks/201709/have-you-experienced-eureka-moments>
- Allen, J. A., Reiter-Palmon, R., Crowe, J., & Scott, C. (2018). Debriefs: Teams learning from doing in context. *American Psychologist*, 73(4), 504–516. <https://doi.org/10.1037/amp0000246>
- Ansell, C., & Geyer, R. (2016). ‘Pragmatic complexity’ a new foundation for moving beyond ‘evidence-based policy making’? *Policy Studies*, 1–19.
<https://doi.org/10.1080/01442872.2016.1219033>
- Argyris, C. (1995). Action science and organizational learning. *Journal of Managerial Psychology*, 10(6), 20–26. <https://doi.org/10.1108/02683949510093849>
- Argyris, C., & Schön, D. A. (1978). *Organizational learning: A theory of action perspective*. Addison-Wesley Publishing Company.
- Armitage, D., Marschke, M., & Plummer, R. (2008). Adaptive co-management and the paradox of learning. *Global Environmental Change*, 18, 86–98.

- Ayas, K., & Zeniuk, N. (2001). Project-based learning: Building communities of reflective practitioners. *Management Learning*, 32(1), 61–76.
<https://doi.org/10.1177/1350507601321005>
- Bäckstrand, K., Khan, J., Kronsell, A., & Lovbrand, E. (2010). The promise of new modes of Environmental Governance. In K. Bäckstrand, J. Kahn, A. Kronsell, & E. Lövbrand, *Environmental Politics and Deliberative Democracy* (p. 13822). Edward Elgar Publishing.
<https://doi.org/10.4337/9781849806411.00009>
- Bai, X., Colbert, M., McPhearson, T., Roberts, D., Siri, J., Walsh, B., & Webb, B. (2019). Networking urban science, policy and practice for sustainability. *Current Opinion in Environmental Sustainability*, 39, 114–122. <https://doi.org/10.1016/j.cosust.2019.08.002>
- Baker, A. C., Jensen, P. J., & Kolb, D. A. (2005). Conversation as experiential learning. *Management Learning*, 36(4), 411–427. <https://doi.org/10.1177/1350507605058130>
- Bapuji, H., & Crossan, M. (2004). From questions to answers: Reviewing organizational learning research. *Management Learning*, 35(4), 397–417.
<https://doi.org/10.1177/1350507604048270>
- Basten, D., & Haamann, T. (2018). Approaches for organizational learning: A literature review. *SAGE Open*, 8(3), 2158244018794224. <https://doi.org/10.1177/2158244018794224>
- Bechtel. (n.d.). Smart City Freiburg: Blazing trails for the city of the future. *Bechtel.Com*. Retrieved November 15, 2022, from <https://www.bechtle.com/de-en/about-bechtel/newsroom/new-horizons/2022/smart-city-freiburg-blazing-trails-for-the-city-of-the-future>
- Beers, P. J., & van Mierlo, B. (2017). Reflexivity and learning in system innovation processes: System innovation processes. *Sociologia Ruralis*, 57(3), 415–436.
<https://doi.org/10.1111/soru.12179>
- Bevilacqua, C., Ou, Y., Pizzimenti, P., & Minervino, G. (2020). New public institutional forms and social innovation in Urban Governance: Insights from the “Mayor’s Office of New Urban Mechanics” (MONUM) in Boston. *Sustainability*, 12(1), 1.
<https://doi.org/10.3390/su12010023>

- Bibri, S. E., & Krogstie, J. (2017). Smart sustainable cities of the future: An extensive interdisciplinary literature review. *Sustainable Cities and Society*, 31, 183–212. <https://doi.org/10.1016/j.scs.2017.02.016>
- Bibri, S. E., & Krogstie, J. (2019). Generating a vision for smart sustainable cities of the future: A scholarly backcasting approach. *European Journal of Futures Research*, 7(1), 5. <https://doi.org/10.1186/s40309-019-0157-0>
- Bolisani, E., & Bratianu, C. (2018). The elusive definition of knowledge. In *Knowledge Management and Organizational Learning* (pp. 1–22). https://doi.org/10.1007/978-3-319-60657-6_1
- Boud, D. (Ed.). (1998). *Current issues and new agendas in workplace learning*. National Centre for Vocational Education Research Ltd.
- Boud, D., Cressey, P., & Docherty, P. (2006). *Productive reflection at work: Learning for changing organizations*. Routledge.
- Bourner, T. (2003). Assessing reflective learning. *Education + Training*, 45(5), 267–272. <https://doi.org/10.1108/00400910310484321>
- Bradbury, H. (2015). *The SAGE handbook of action research*. SAGE.
- Bradbury, H., Waddell, S., O’ Brien, K., Apgar, M., Teehankee, B., & Fazey, I. (2019). A call to action research for transformations: The times demand it. *Action Research*, 17(1), 3–10. <https://doi.org/10.1177/1476750319829633>
- Brix, J. (2017). Exploring knowledge creation processes as a source of organizational learning: A longitudinal case study of a public innovation project. *Scandinavian Journal of Management*, 33(2), 113–127. <https://doi.org/10.1016/j.scaman.2017.05.001>
- Castán Broto, V. (2017). Urban governance and the politics of climate change. *World Development*, 93, 1–15. <https://doi.org/10.1016/j.worlddev.2016.12.031>
- Chaffin, B. C., Gosnell, H., & Cosens, B. A. (2014). A decade of adaptive governance scholarship: Synthesis and future directions. *Ecology and Society*, 19(3). <https://www.jstor.org/stable/26269646>

- Chiva, R., & Alegre, J. (2005). Organizational learning and organizational knowledge: Towards the integration of two approaches. *Management Learning*, 36(1), 49–68.
<https://doi.org/10.1177/1350507605049906>
- Choi, T., & Chandler, S. M. (2020). Knowledge vacuum: An organizational learning dynamic of how e-government innovations fail. *Government Information Quarterly*, 37(1), 101416.
<https://doi.org/10.1016/j.giq.2019.101416>
- Craig, D. V. (2009). *Action research essentials*. San Francisco, Calif. : Jossey-Bass.
<http://archive.org/details/actionresearches0000crai>
- Crawford, L., Costello, K., Pollack, J., & Bentley, L. (2003). Managing soft change projects in the public sector. *International Journal of Project Management*, 21(6), 443–448.
[https://doi.org/10.1016/S0263-7863\(02\)00099-6](https://doi.org/10.1016/S0263-7863(02)00099-6)
- Crossan, M. M., & Berdrow, I. (2003). Organizational learning and strategic renewal. *Strategic Management Journal*, 24(11), 1087–1105. <https://doi.org/10.1002/smj.342>
- Crossan, M. M., Lane, H. W., & White, R. E. (1999). An organizational learning framework: From intuition to institution. *Academy of Management Review*, 24(3), 522–537.
- Cunliffe, A. L. (2002). Reflexive dialogical practice in management learning. *Management Learning*, 33(1), 35–61. <https://doi.org/10.1177/1350507602331002>
- da Cruz, N. F., Rode, P., & McQuarrie, M. (2019). New urban governance: A review of current themes and future priorities. *Journal of Urban Affairs*, 41(1), 1–19.
<https://doi.org/10.1080/07352166.2018.1499416>
- Decuyper, S., Dochy, F., & Van den Bossche, P. (2010). Grasping the dynamic complexity of team learning: An integrative model for effective team learning in organisations. *Educational Research Review*, 5(2), 111–133. <https://doi.org/10.1016/j.edurev.2010.02.002>
- DeFillippi, R. J. (2001). Introduction: Project-based learning, reflective practices and learning. *Management Learning*, 32(1), 5–10. <https://doi.org/10.1177/1350507601321001>
- Dick, B. (1993). *You want to do an action research thesis?*
<http://www.aral.com.au/resources/arthesis.html>
- Digital Strategy Freiburg. (n.d.). Digital Strategy Freiburg. Retrieved March 9, 2022, from <https://digital.freiburg.de/neuigkeiten/detail/digital-strategy-freiburg>

- Digitaler Aufbruch und moderne Verwaltung.* (n.d.). Die Bundesregierung informiert. Retrieved November 9, 2022, from <https://www.bundesregierung.de/breg-de/aktuelles/moderner-digitaler-staat-2018292>
- Digitalisierung.* (n.d.). Die Bundesregierung informiert. Retrieved November 9, 2022, from <https://www.bundesregierung.de/breg-de/themen/digitalisierung-1682698>
- Dingsøyr, T., Moe, N. B., Schalken, J., & Stålhane, T. (2007). Organizational learning through project postmortem reviews – An explorative case study. In P. Abrahamsson, N. Baddoo, T. Margaria, & R. Messnarz (Eds.), *Software Process Improvement* (pp. 136–147). Springer. https://doi.org/10.1007/978-3-540-75381-0_13
- Dryzek, J. S. (2017). *The politics of the earth* (Vol. 1). Oxford University Press. <https://doi.org/10.1093/hepl/9780199696000.001.0001>
- Easterby-Smith, M., Araujo, L., & Burgoyne, J. (1999). *Organizational learning and the learning organization: Developments in theory and practice*. SAGE.
- Easterby-Smith, M., Crossan, M., & Nicolini, D. (2000). Organizational learning: Debates past, present and future. *Journal of Management Studies*, 37(6), 783–796. <https://doi.org/10.1111/1467-6486.00203>
- Edmondson, A. C., Bohmer, R. M., & Pisano, G. P. (2001). Disrupted routines: Team learning and new technology implementation in hospitals. *Administrative Science Quarterly*, 46(4), 685–716. <https://doi.org/10.2307/3094828>
- Eggers, W. D., Mills, A., Verheggen, H., & Joergensen, C. (2021, March 4). *Agile government*. Deloitte Insights. <https://www2.deloitte.com/us/en/insights/industry/public-sector/government-trends/2021/agile-at-scale-in-government.html>
- Elkjaer, B. (2004). Organizational learning: The ‘third way.’ *Management Learning*, 35(4), 419–434. <https://doi.org/10.1177/1350507604048271>
- Eneqvist, E., & Karvonen, A. (2021). Experimental governance and urban planning futures: Five strategic functions for municipalities in local innovation. *Urban Planning*, 6(1), 1.

- Estevez, E., Pardo, T. A., & Scholl, H. J. (Eds.). (2021). *Smart cities and smart governance: Towards the 22nd century sustainable city* (Vol. 37). Springer International Publishing.
<https://doi.org/10.1007/978-3-030-61033-3>
- Evans, J., Vácha, T., Kok, H., & Watson, K. (2021). How cities learn: From experimentation to transformation. *Urban Planning*, 6(1), 1. <https://doi.org/10.17645/up.v6i1.3545>
- Faller, P., Lundgren, H., & Marsick, V. (2020). Overview: Why and how does reflection matter in workplace learning? *Advances in Developing Human Resources*, 22(3), 248–263.
<https://doi.org/10.1177/1523422320927295>
- Fastenrath, S., & Coenen, L. (2021). Future-proof cities through governance experiments? Insights from the Resilient Melbourne Strategy (RMS). *Regional Studies*, 55(1), 138–149.
<https://doi.org/10.1080/00343404.2020.1744551>
- Fazey, I., Schäpke, N., Caniglia, G., Patterson, J., Hultman, J., van Mierlo, B., Säwe, F., Wiek, A., Wittmayer, J., Aldunce, P., Al Waer, H., Battacharya, N., Bradbury, H., Carmen, E., Colvin, J., Cvitanovic, C., D’Souza, M., Gopel, M., Goldstein, B., ... Wyborn, C. (2018). Ten essentials for action-oriented and second order energy transitions, transformations and climate change research. *Energy Research & Social Science*, 40, 54–70.
<https://doi.org/10.1016/j.erss.2017.11.026>
- Fisher, K., & Phelps, R. (2006). Recipe or performing art?: Challenging conventions for writing action research theses. *Action Research*, 4(2), 143–164.
<https://doi.org/10.1177/1476750306063989>
- Flick, U. (2022). *The SAGE handbook of qualitative research design*. SAGE.
- Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, 12(2), 219–245. <https://doi.org/10.1177/1077800405284363>
- Freeth, R., & Vilsmaier, U. (2020). Researching collaborative interdisciplinary teams: Practices and principles for navigating researcher positionality. *Science & Technology Studies*, 33(3), 3.
<https://doi.org/10.23987/sts.73060>
- Freiburg wird digital: Neues Amt für Digitalisierung ab 1. Januar 2019. (2018, October 24).
StadtBESTEN Freiburg - Das BESTE in deiner Stadt.

<https://freiburg.stadtbesten.de/freiburg-wird-digital-neues-amt-fuer-digitalisierung-ab-1-januar-2019/>

Fritz, S. (2020, September 8). 32 Modellprojekte Smart Cities für die zweite Staffel ausgewählt.

Smart City Dialog. <https://www.smart-city-dialog.de/aktuelles/32-modellprojekte-smart-cities-fuer-die-zweite-staffel-ausgewaehlt>

Fuglsang, L., & Hansen, A. V. (2022). Framing improvements of public innovation in a living lab context: Processual learning, restrained space and democratic engagement. *Research Policy*, 51(1), 104390. <https://doi.org/10.1016/j.respol.2021.104390>

German Federal Government. (n.d.). *Open Government in Germany*. Open Government in Germany. Retrieved November 18, 2022, from <https://www.open-government-deutschland.de/opengov-en>

Gilson, C. C., Dunleavy, P., & Tinkler, J. (2009). *Organizational learning in government sector organizations: Literature review* (p. 44). LSE Public Policy Group. <http://eprints.lse.ac.uk/59228/>

Gordijn, F., Eernstman, N., Helder, J., & Brouwer, H. (2018). *Reflection methods: Practical guide for trainers and facilitators: Tools to make learning more meaningful*. Wageningen Centre for Development Innovation. <https://doi.org/10.18174/439461>

Grabher, G. (2004). Temporary architectures of learning: Knowledge governance in project ecologies. *Organization Studies*, 25(9), 1491–1514. <https://doi.org/10.1177/0170840604047996>

Grant, C., & Osanloo, A. (2014). Understanding, selecting, and integrating a theoretical framework in dissertation research: Creating the blueprint for your “house.” *Administrative Issues Journal Education Practice and Research*, 4(2). <https://doi.org/10.5929/2014.4.2.9>

Hendriks, F. (2014). Understanding good urban governance: Essentials, shifts, and values. *Urban Affairs Review*, 50(4), 553–576. <https://doi.org/10.1177/1078087413511782>

Hilden, S., & Tikkanmäki, K. (2013). Reflective practice as a fuel for organizational learning. *Administrative Sciences*, 3(3), 76–95. <https://doi.org/10.3390/admsci3030076>

Illeris, K. (2018). An overview of the history of learning theory. *European Journal of Education*, 53(1), 86–101. <https://doi.org/10.1111/ejed.12265>

- Jackson, P. (2010). From function to use. In *Web 2.0 Knowledge Technologies and the Enterprise* (pp. 155–196). Elsevier. <https://doi.org/10.1016/B978-1-84334-537-4.50006-5>
- Jens Kitzler. (2020, June 25). Fünf Kritikpunkte an Dietenbach – und was dahinter steckt. *Badische Zeitung*. <https://www.badische-zeitung.de/fuenf-kritikpunkte-an-dietenbach-und-was-dahinter-steckt>
- Kayes, A. B., Kayes, D. C., & Kolb, D. A. (2005). Experiential learning in teams. *Simulation & Gaming*, 36(3), 330–354. <https://doi.org/10.1177/1046878105279012>
- KfW (Kreditanstalt für Wiederaufbau). (2021). *Merkblatt Modellprojekte Smart Cities: Stadtentwicklung und Digitalisierung*. KfW (Kreditanstalt für Wiederaufbau) - Credit Institute for Reconstruction. [https://www.kfw.de/PDF/Download-Center/F%C3%B6rderprogramme-\(Inlandsf%C3%B6rderung\)/PDF-Dokumente/6000004472_M_436_Smart_Cities.pdf](https://www.kfw.de/PDF/Download-Center/F%C3%B6rderprogramme-(Inlandsf%C3%B6rderung)/PDF-Dokumente/6000004472_M_436_Smart_Cities.pdf)
- Khan, S. N. (2014). Qualitative research method: Grounded theory. *International Journal of Business and Management*, 9(11), p224. <https://doi.org/10.5539/ijbm.v9n11p224>
- Kitchin, R., Lauriault, T. P., & McArdle, G. (2015). Knowing and governing cities through urban indicators, city benchmarking and real-time dashboards. *Regional Studies, Regional Science*, 2(1), 6–28. <https://doi.org/10.1080/21681376.2014.983149>
- Knipfer, K., Kump, B., Wessel, D., & Cress, U. (2013). Reflection as a catalyst for organisational learning. *Studies in Continuing Education*, 35(1), 30–48. <https://doi.org/10.1080/0158037X.2012.683780>
- Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development* (Second edition). Pearson Education, Inc.
- Kotnour, T. (2000). Organizational learning practices in the project management environment. *International Journal of Quality & Reliability Management*, 17(4/5), 393–406. <https://doi.org/10.1108/02656710010298418>
- Kronsell, A., & Mukhtar-Landgren, D. (2018). Experimental governance: The role of municipalities in urban living labs. *European Planning Studies*, 26(5), 988–1007. <https://doi.org/10.1080/09654313.2018.1435631>

- Lang, D. J., Wiek, A., Bergmann, M., Stauffacher, M., Martens, P., Moll, P., Swilling, M., & Thomas, C. J. (2012). Transdisciplinary research in sustainability science: Practice, principles, and challenges. *Sustainability Science*, 7(1), 25–43.
<https://doi.org/10.1007/s11625-011-0149-x>
- Li, L. C., Grimshaw, J. M., Nielsen, C., Judd, M., Coyte, P. C., & Graham, I. D. (2009). Evolution of Wenger's concept of community of practice. *Implementation Science*, 4(1), 11.
<https://doi.org/10.1186/1748-5908-4-11>
- Loeber, A., van Mierlo, B., Grin, J., & Leeuwis, C. (2009). The practical value of theory: Conceptualising learning in the pursuit of a sustainable development. In *Social learning towards a sustainable world: Principles, perspectives and praxis*.
<https://www.wageningenacademic.com/doi/book/10.3920/978-90-8686-594-9>
- Loorbach, D. (2010). Transition management for sustainable development: A prescriptive, complexity-based governance framework. *Governance*, 23(1), 161–183.
<https://doi.org/10.1111/j.1468-0491.2009.01471.x>
- Luederitz, C., Schöpke, N., Wiek, A., Lang, D. J., Bergmann, M., Bos, J. J., Burch, S., Davies, A., Evans, J., König, A., Farrelly, M. A., Forrest, N., Frantzeskaki, N., Gibson, R. B., Kay, B., Loorbach, D., McCormick, K., Parodi, O., Rauschmayer, F., ... Westley, F. R. (2017). Learning through evaluation – A tentative evaluative scheme for sustainability transition experiments. *Journal of Cleaner Production*, 169, 61–76.
<https://doi.org/10.1016/j.jclepro.2016.09.005>
- March, J. G. (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2(1), 71–87. <https://doi.org/10.1287/orsc.2.1.71>
- McCormick, G. (2016). *Learning hard or hardly learning? Exploring processes of experiential, transformative and social learning in an Urban Living Lab*.
- Meijer, A., & Bolívar, M. P. R. (2016). Governing the smart city: A review of the literature on smart urban governance. *International Review of Administrative Sciences*, 82(2), 392–408.
<https://doi.org/10.1177/0020852314564308>

- Mezirow, J. (1990). How critical reflection triggers transformative learning. In *Fostering Critical Reflection in Adulthood: A Guide to Transformative and Emancipatory learning* (pp. 1–20). Jossey-Bass.
- Migliore, L. (2020, April 6). The Aha! MMoment: The science behind creative insight. *Brain World Magazine*. <https://brainworldmagazine.com/aha-moment-science-behind-creative-insight/>
- Miles, D. A. (2017). *A taxonomy of research gaps: Identifying and defining the seven research gaps*.
- Model projects Archives. (n.d.). *Smart City Dialog*. Retrieved February 16, 2022, from <https://www.smart-city-dialog.de/en/category/model-projects>
- Modellprojekte Archives. (n.d.). *Smart City Dialog*. Retrieved November 9, 2022, from <https://www.smart-city-dialog.de/category/modellprojekte>
- Moon, J. A. (2004). *A handbook of reflective and experiential Learning*. Routledge.
<https://doi.org/10.4324/9780203416150>
- Morris, T. H. (2020). Experiential learning – a systematic review and revision of Kolb’s model. *Interactive Learning Environments*, 28(8), 1064–1077.
<https://doi.org/10.1080/10494820.2019.1570279>
- Nonaka, I. (1994). A dynamic theory of organizational knowledge creation. *Organization Science*, 5(1), 14–37. <https://doi.org/10.1287/orsc.5.1.14>
- North, K., & Kumta, G. (2018). *Knowledge management*. Springer International Publishing.
<https://doi.org/10.1007/978-3-319-59978-6>
- Olejarski, A. M., Potter, M., & Morrison, R. L. (2019). Organizational learning in the public sector: Culture, politics, and performance. *Public Integrity*, 21(1), 69–85.
<https://doi.org/10.1080/10999922.2018.1445411>
- Örtenblad, A. (2002). A typology of the idea of learning organization. *Management Learning*, 33(2). <https://doi.org/10.1177/1350507602332004>
- Pammer, V., Krogstie, B., & Prilla, M. (2017). Let’s talk about reflection at work. *International Journal of Technology Enhanced Learning*, 9(2), 151.
- Pre-Commercial Procurement | Shaping Europe’s digital future*. (n.d.). Retrieved November 15, 2022, from <https://digital-strategy.ec.europa.eu/en/policies/pre-commercial-procurement>

- Project Management Institute. (n.d.). *What is Agile?* Retrieved November 9, 2022, from <https://www.pmi.org/disciplined-agile/agile/whatisagile>
- Public Service Lab Week 2020. (n.d.). Public Service Lab Week 2020. Retrieved November 9, 2022, from <https://digital.freiburg.de/neuigkeiten/detail/public-service-lab-week-2020>
- Raelin, J. A. (2001). Public reflection as the basis of learning. *Management Learning*, 32(1), 11–30. <https://doi.org/10.1177/1350507601321002>
- Raelin, J. A. (2002). “I don’t have time to think!” (vs. The Art of Reflective Practice). *Reflections*, 4(1), 66–79.
- Reese, H. W. (2011). The learning-by-doing principle. *Behavioral Development Bulletin*, 11. <https://psycnet.apa.org/fulltext/2014-55719-001.html>
- Reflect more to learn faster. (n.d.). Deloitte Insights. Retrieved July 14, 2022, from <https://www2.deloitte.com/us/en/insights/topics/talent/business-performance-improvement/reflect-on-experiences-learning-faster.html>
- Reflective Learning: Thinking About the Way You Learn – Effectiviology. (n.d.). Retrieved July 13, 2022, from <https://effectiviology.com/reflective-learning/>
- Reilly, B. (2019, April 17). *Freiburg’s Dietenbach decision: Building a future or bulldozing values?* Weave News. <https://www.weavenews.org/stories/2019/04/17/2019-4-15-freiburgs-dietenbach-decision-building-a-future-or-bulldozing-values>
- Schein, E. (1995). *Kurt Lewin’s Change Theory in the field and in the classroom: Notes toward a model of managed learning*. <https://dspace.mit.edu/bitstream/handle/1721.1/2576/SWP-3821-32871445.pdf>
- Schindler, M., & Eppler, M. J. (2003). Harvesting project knowledge: A review of project learning methods and success factors. *International Journal of Project Management*, 21(3), 219–228. [https://doi.org/10.1016/S0263-7863\(02\)00096-0](https://doi.org/10.1016/S0263-7863(02)00096-0)
- Schippers, M. C., West, M. A., & Dawson, J. F. (2015). Team reflexivity and innovation: The moderating role of team context. *Journal of Management*, 41(3), 769–788. <https://doi.org/10.1177/0149206312441210>

- Schneider, B. (2012). Participatory action research, mental health service user research, and the Hearing (our) Voices Projects. *International Journal of Qualitative Methods*, 11(2), 152–165. <https://doi.org/10.1177/160940691201100203>
- Schön, D. A. (2008). *Reflective Practitioner: How Professionals Think In Action*. Basic Books.
- Schwartz-Shea, P., & Yanow, D. (2013). *Interpretive Research Design*. Routledge.
<https://doi.org/10.4324/9780203854907>
- Senge, P. M. (1994). *The fifth discipline: The art and practice of the learning organization* (1. Currency paperback ed). Currency Doubleday.
- Sense, A. J. (2009). Knowledge creation spaces: The pPower of project teams. In D. Karagiannis & Z. Jin (Eds.), *Knowledge Science, Engineering and Management* (Vol. 5914, pp. 347–357). Springer-Verlag Berlin.
<https://www.webofscience.com/wos/woscc/full-record/WOS:000276636000030>
- Sense, A. J. (2011). The project workplace for organizational learning development. *International Journal of Project Management*, 29(8), 986–993.
<https://doi.org/10.1016/j.ijproman.2011.01.012>
- Serrat, O. (2009). *A Primer on Organizational Learning*. Asian Development Bank.
- Simrnons, G., Giraldo, J. E. D., Truong, Y., & Palmer, M. (2018). Uncovering the link between governance as an innovation process and socio-economic regime transition in cities. *Research Policy*, 47(1), 241–251. <https://doi.org/10.1016/j.respol.2017.11.002>
- Smart-City-Modellprojekt startet in Entwicklungsphase. (n.d.). Retrieved November 9, 2022, from <https://www.freiburg.de/pb/1847419.html>
- Smith, D. C. (2009). What can we expect from performance management activities that we cannot expect from performance measurement? *Journal of Policy Analysis and Management*, 28(3), 512–514.
- Stadt Freiburg im Breisgau. (n.d.). *Freiburg im Programm “Smart Cities 2020.”* digital freiburg | Aktivitäten. Retrieved November 9, 2022, from <https://digital.freiburg.de/neuigkeiten/detail/freiburg-im-programm-smart-cities-2020>
- Stadt Freiburg im Breisgau. (n.d.-a) *Begriffserklärung User Story & Use Case*. Unpublished internal document.

- Stadt Freiburg im Breisgau. (n.d.-b) *Begriffserläuterungen*. Unpublished internal document.
- Stadt Freiburg im Breisgau. (n.d.-c) Teilprojektauftrag Connected Participation. Unpublished internal document.
- Sterling, S. (2010). *Transformative learning and sustainability: Sketching the conceptual ground*. 17.
- Tuckman, B. W. (1965). Developmental sequence in small groups. *Psychological Bulletin*, 63, 384–399. <https://doi.org/10.1037/h0022100>
- UN Press. (2012, April 23). ‘Our Struggle for Global Sustainability Will Be Won or Lost in Cities,’ Says Secretary-General, at New York Event. <https://press.un.org/en/2012/sgsm14249.doc.htm>
- United Nations. (2017). *The New Urban Agenda*. United Nations. <https://habitat3.org/wp-content/uploads/NUA-English.pdf>
- van den Dool, L., & Schaap, L. (2020). Learning processes in an urban governance context: A theoretical exploration. In L. van den Dool (Ed.), *Strategies for Urban Network Learning: International Practices and Theoretical Reflections* (pp. 13–29). Springer International Publishing. https://doi.org/10.1007/978-3-030-36048-1_2
- van der Meulen, E. (2011). Participatory and action-oriented dissertations: The challenges and importance of community-engaged graduate research. *The Qualitative Report*, 16(5), 1291–1303.
- van Mierlo, B., & Beers, P. J. (2020). Understanding and governing learning in sustainability transitions: A review. *Environmental Innovation and Societal Transitions*, 34, 255–269. <https://doi.org/10.1016/j.eist.2018.08.002>
- van Mierlo, B., Regeer, B., van Amstel, M., Arkesteijn, M., Beekman, V., Bunders, J., de Cock Buning, T., Elzen, B., Hoes, A.-C., & Leeuwis, C. (2010). *Reflexive monitoring in action. A guide for monitoring system innovation projects*. Wageningen/Amsterdam: Communication and Innovation Studies, WUR; Athena Institute, VU. <https://library.wur.nl/WebQuery/wurpubs/fulltext/149471>

- van Oers, L., de Hoop, E., Jolivet, E., Marvin, S., Späth, P., & Raven, R. (2020). The politics of smart expectations: Interrogating the knowledge claims of smart mobility. *Futures*, 122, 102604. <https://doi.org/10.1016/j.futures.2020.102604>
- Vilsmaier, U., & Meyer, E. (2019). Inquiry-based learning in sustainability science. In H. A. Mieg (Ed.), *Inquiry-Based Learning – Undergraduate Research* (pp. 331–339). Springer International Publishing. https://doi.org/10.1007/978-3-030-14223-0_31
- Vince, R. (2002). Organizing Reflection. *Management Learning*, 33(1), 63–78. <https://doi.org/10.1177/1350507602331003>
- Wang, C. L., & Ahmed, P. K. (2003). Organisational learning: A critical review. *The Learning Organization*, 10(1), 8–17. <https://doi.org/10.1108/09696470310457469>
- Wenkel, R. (2017, June 9). Germany in the digital slow lane. *Deutsche Welle*. <https://www.dw.com/en/germany-in-the-digital-slow-lane/a-39187166>
- Wittmayer, J., Loorbach, D., Bogner, K., Hendlin, Y., Hölscher, K., Lavanga, M., Vasques, A., von Wirth, T., & Wal, M. (2021). *Transformative Research: Knowledge and action for just sustainability transitions*. <https://doi.org/10.13140/RG.2.2.28485.99047>
- Wittmayer, J. M., & Schäpke, N. (2014). Action, research and participation: Roles of researchers in sustainability transitions. *Sustainability Science*, 9(4), 483–496. <https://doi.org/10.1007/s11625-014-0258-4>
- Zuber-Skerritt, O., & Fletcher, M. (2007). The quality of an action research thesis in the social sciences. *Quality Assurance in Education*, 15(4), 413–436. <https://doi.org/10.1108/09684880710829983>
- Zuber-Skerritt, O., & Perry, C. (2002). Action research within organisations and university thesis writing. *The Learning Organization*, 9(4), 171–179. <https://doi.org/10.1108/09696470210428895>

Appendices

Appendix A: Further Information for Section 2 - Literature Review and Analytical Framework

Appendix A1: Definition of organizational learning from literature

To further illustrate the conceptual diversity in the literature, I have included Table I from Wang and Ahmed (2003, p. 10), their summary of the concept of organization learning from their literature review. In addition, I have included my own list from several sources during my own literature search, although this is by no means an exhaustive list as the purpose of this study was not to conduct a literature review.

Table 26: A Summary of the Organizational Learning Concept and Practices from Wang and Ahmed (2003, p. 10)

Focus	The concept of organisational learning	Practices
Individual learning	"Organisational learning occurs when individuals within an organisation experience a problematic situation and inquire into it on the organisational behalf" (Argyris and Schon, 1996, p. 16)	Staff training and development
Process or system	Organisational learning is the process whereby organisations understand and manage their experiences (Glynn <i>et al.</i> , 1992)	Enhancement of information processing and problem solving capability
Culture or metaphor	"A learning organisation should be viewed as a metaphor rather than a distinct type of structure, whose employees learn conscious communal processes for continually generating, retaining and leveraging individual and collective learning to improve performance of the organisational system in ways important to all stakeholders and by monitoring and improving performance" (Drew and Smith, 1995)	Creation and maintenance of learning culture: collaborative team working, employee empowerment and involvement, etc.
Knowledge management	Organisational learning is the changes in the state of knowledge (Lyles, 1992, 1998). It involves knowledge acquisition, dissemination, refinement, creation and implementation: the ability to acquire diverse information and to share common understanding so that this knowledge can be exploited (Fiol, 1994) and the ability to develop insights, knowledge, and to associate among past and future activities (Fiol and Lyles, 1985)	Facilitation of interaction and strengthening of knowledge base
Continuous improvement	"A learning organisation should consciously and intentionally devote to the facilitation of individual learning in order to continuously transform the entire organisation and its context" (Pedler <i>et al.</i> , 1991)	The adoption of TQM practices

Table 27: Definitions of Organizational Learning from My Literature Search

Definition of organizational learning	Source
“In order to become organisational, the learning that results from organisational inquiry “must become embedded in the images of organisation held in its members’ minds, and/or in the epistemological artefacts (the maps, memories and programs) embedded in the organisational environment.”	(Argyris and Schön, 1996, p. 16, as cited in van Mierlo & Beers, 2020, p. 261)
“The process through which organizations change or modify their mental models, rules, processes or knowledge, maintaining or improving their performance.”	(Chiva et al., 2014, p. 689, as cited in Basten & Haamann, 2018 p. 2)
“Organisational learning occurs when individuals within an organisation experience a problematic situation and inquire into it on the organisational behalf. They experience a surprising mismatch between expected and actual results of action and respond to that mismatch through a process of thought and further action that leads them to modify their images of organisation or their understandings of organisational phenomena and to restructure their activities so as to bring outcomes and expectations into line, thereby changing organisational theory-in-use”	(Wang & Ahmed, 2003, p. 9)
“Organizational learning is the efficient procedure for the processing, interpretation and improvement of representations of reality, which is knowledge. This process takes place through the members of the organization, or by supposing that the organization has the same cognitive processes as its members. Knowledge is codified, stored and easily transmitted. When this transmission of knowledge occurs, or it is embedded in rules or routines, or brought into a social context, then organizational knowledge is created. Learning and knowledge are separate, which allows them to be dealt with independently.”	(“Cognitive-possession” perspective according to Chiva and Alegre, 2005, p. 62)
“Organizational learning and organizational knowledge are similar (given that the latter is a process, and not a resource), and signify the social construction of beliefs and shared meanings, where social context, cultural artefacts, collective group actions and participation play an essential role. Learning is not understood as a way of knowing the world, but as a way of being in the world (Gherardi, 1999).” (p. 62)	(“Social-process” perspective according to Chiva and Alegre, 2005, p.62)
“Organizational learning as a process requiring changing short-term rules (“behavioral outcomes”) and long-term norms (“collective consciousness”) through Denhardt’s (2011) critical reflection of knowledge and experiences.	(Fiol and Lyles, 1985, p. 810, as cited in Olejarski et al., 2019)
“Organizational learning is the process of creating new knowledge for strategic renewal and disseminating it to where it is relevant so that it can be used; reworked or rejected.”	(Brix, 2017, p. 117)

Appendix A2: Reflection on literature review process

Here, I include some additional information regarding my learning process through the literature review. In my literature review, I included literature regarding learning more broadly (not just in organizational learning), but primarily focused on learning taking into consideration the following:

- Context:
 - Informal learning (as opposed to formal learning – i.e., in a planned curriculum with the support of someone in an “educator” role)
 - Learning in the workplace in public sector organization (where possible, although literature on public sector is comparatively sparse)
 - Project-based learning, which is time- and context-bound, as opposed to continuous learning as part of daily organizational life
- Who:
 - Adult learning, as opposed to school or university students
 - Primarily focused on the group/team-based learning (as opposed to individual or organizational)
- How:
 - Learning through accomplishing work tasks, i.e., “Learning-by-doing (or rather, learning-while-doing), as opposed to in classroom/training or “simulated” setting
 - Learning in prototyping or pilot or experimental approaches (although whether or not this project can be considered experimental is debatable)

In the beginning, although I was aware that there are many definitions of learning both in the literature and in the personal understanding of the participants of my research project, I initially did not critically examine the working definitions presented in various articles of organizational learning, especially literature review articles. As I encountered significant tensions throughout the research, the article from Chiva and Alegre (2005) helped me realize that this could be due to the epistemological divide of the underlying “social-process” vs. “cognitive-possession” perspectives. Reflecting on the ideas posited by the social-process perspective, I realized that this perspective is more in line with my own (at least consciously espoused) epistemological viewpoint of postmodernism, interpretivism and pragmatism. Perhaps the tensions I encountered was a reflection of the discrepancy between theories-in-use and theories-in-action (Argyris & Schön, 1978). It revealed to me the discrepancies between my espoused theory (of social constructivism of knowledge) and my theories-in-use (of more positivistic understanding of knowledge as a “justified true belief”). Practices such as documenting lessons learned and use of knowledge management tools often have an underlying resource/stock-based concept of knowledge that is prevalent and often unquestioned in the corporate/management world. The implication of this realization is that it has now become apparent to me how fundamental it was for my research project to critically formulate my conception of learning, particularly of my epistemology (as opposed to “picking a definition that fits”). Unconsciously, I had held conflicting ideas of cognitive-possession perspective of knowledge, although I would not have espoused this theory explicitly. Nevertheless, some of the ideas I held still implied it, showing how embedded my mental models are after years of habitual acceptance of the transmission theory of knowledge through the educational systems and socialization.

What does it mean for this study to view organizational learning and knowledge through the lens of a social-process perspective? For one, this brings to question the merit of the approach of codifying tacit knowledge into explicit knowledge (North & Kumta, 2018). Previously, I would have agreed with such authors that improving the practice of collecting and disseminating lessons learned throughout the organization would be conducive (even if not sufficient) for organizational learning. But the social-process perspective challenges the idea that such “knowledge” can be “abstracted” from the minds of the individuals and shared with others. The focus then should not be to institute a formalized procedure to “document lessons learned” but to create more space for shared meaning-making (process focus). This is in line with the argument from Easterby-Smith et al. (2000) argument that the focus on process will offer future operational consequences, such as in devising new ways of sustaining and fostering learning processes. I attempted to course-correct in this study based on the realization of my epistemological disconnect. However, I am less familiar with the literature cited for the social-process perspective and did not have time to delve into them in detail. Chiva and Alegre (2005) also did not categorize Crossan et al. (1999) or Kolb’s ELT in their review, and I found evidence of both perspectives in these works (although I judged them to be closer to social-process). Throughout the research, I continued struggling with the navigation of the cognitive dissonances between these perspectives, which led to significant learning on my part. The underlying perspective of learning that informs this study is thus straddling the tension of my “old/theory-in-use” of cognitive-possession between the “new/espoused” social-process perspective.

Appendix B: Further Information for Section 3 - Methodology

Appendix B1: List of departments in German

For additional reference, these are the original department names in German.

Table 28: List of Departments Involved in the Project in German and English

Translated department name	Original department name in German
Office for Project Development and Urban Renewal	Amt für Projektentwicklung und Stadterneuerung (APS)
Digital and IT	Digitales und IT (DIGIT)
Office of Citizen Services and Information Management	Amt für Bürgerservice und Informationsmanagement (ABI)
Surveying Office	Vermessungsamt
Office for Real Estate and Housing	Amt für Liegenschaften und Wohnungswesen (ALW)
Dietenbach Project Group	Projektgruppe Dietenbach (PGD)
Urban Planning Office	Stadtplanungsamt (StPA)
Garden and Civil Engineering Office	Garten- und Tiefbauamt (GuT)
Main and Personnel Office	Haupt- und Personalamt (HPA)
Legal Office	Rechtsamt
Office of the First Mayor von Kirchbach	Büro des Ersten Bürgermeisters von Kirchbach

Appendix B2: Original research plan

This was the original research plan as part of the research proposal and as communicated to the research participants in the first workshop.

Table 29: Original Research Plan in the Research Proposal

Timeframe	Key activities
May 23 – 30 (Plan)	1) 1-hour prep meeting with project management: How does learning work at the moment in the project? 2) 2-hour workshop with project team: participatory problem structuring, vision-building, agenda formulation
June 6 – 24 (Act & Observe)	Project team implements agreed-upon action plan and observes the results
June 27 – July 1 (Reflect)	1-hour feedback session with prep work e.g. questionnaire
July 1 - 15	1) Incorporate lessons learned from first intervention and adapt plan as necessary for minor action cycle 2) Conduct interviews regarding perceived barriers to enabling organizational learning
July 25 – Aug 5	Optional minor action research cycle (Act & Observe)
Aug 8 - 19	Overall reflection: 1-hour participatory evaluation and reflections of method, content and whole process
Aug 22 – Nov 23	Thesis write-up and submission
December	Presentation of findings to project participants



Figure 9: Research Project Schedule as Communicated to Participants at First Workshop

Appendix B3: Intervention design decision documentation - reflection-in-action

Here, I provide an example of the documentation that I made during the process of making the design decisions regarding the structure of the group reflection sessions. This was shared with the deputy project lead (the project lead was out of office) and the moderator for input.

Erste grundlegende Entscheidung: Nehmen wir die Termine wie sie schon terminiert sind oder suchen wir eine Alternative?

Hier sind einige Optionen. Ich habe die nicht alle ausgefüllt, weil einige Optionen mir vergleichsweise zu "schlecht" wären, aber nur zur Info habe ich sie dargelegt (die sozusagen "ausgeworfene" Alternativen).

	Optionen	Kommentar	Pros / Opportunities:	Cons / Risks:	Assumptions	Requirements for this to work	Trade-Offs
1	Termine behalten, wie sie sind- wir versuchen, das Beste daraus zu mache	Das ist sozusagen "stay on course as is"	<ul style="list-style-type: none"> Termine stehen schon im Kalender, TN haben meistens zugesagt, August ist eine schwieriger Zeit sonst, was Neues zu finden 1-Stunde ist einfacher einzurichten Als Teil des MA schafft evtl. ein gewisse Distanz zum PM, um offener zu sein? 	<ul style="list-style-type: none"> Es ist ein großes Thema - zu wenig Zeit um das anzugehen kann nicht nur zur Verwirrung/Frustration bei den TN erzeugen, sondern auch wenig Ergebnis für meine MA TN könnten eine sehr negative Erfahrung von Reflective Practice und Teilnahme an MA Forschung bekommen Genug Zeit / Erklärungsarbeit vorher ist notwendig - aber wir haben leider keine Zeit mehr dafür Da es Teil meiner MA und nicht Teil des Projektes ist, kann es sein, dass manche TN im letzten Moment absagen 	<ul style="list-style-type: none"> Better done than perfect? To try out an imperfect solution and improve rather than hope for the best conditions? Da die TN bis jetzt ganz offen und evtl. mir / meiner Masterarbeit zuliebe ganz hilfsbereit sind, wären sie evtl. nachsichtig, wenn die WS nicht perfekt laufen 	<ul style="list-style-type: none"> Sehr gute Erwartungsmanagement Sehr gut vorbereitete, gut strukturierte Sitzung - SEHR klare Erklärung/Einführung Die Teilnehmer auf dem Thema halten Idealerweise: individuelle Absprache vorher (schwierig mit Zeitdruck), Vorarbeit im Voraus (Vorbelegung mit bestimmten Materialien) Testlauf (schwierig mit Zeitdruck) 	<ul style="list-style-type: none"> Besser strukturierte / vorbereitete Sessions mit viel mehr Zeit, um in die Tiefe zu gehen und zu diskutieren
2	Um Verlängerung der Termine fragen: entweder nach vorne oder nach hinten ziehen	Nicht wirklich machbar, da hinten ist Mittagspause (12 Uhr), vorher sind viele in Gruppenarbeit für die Leistungsbeschreibung	<ul style="list-style-type: none"> Mehr Zeit zum diskutieren Eine Stunde ist ja schon "gebucht", muss keine komplett neue Zeitfenster suchen 	<ul style="list-style-type: none"> Nicht alle TN können die ganze Zeit bleiben oder da sein ggf. negative Stimmung / weniger Motivation? (ich habe gemerkt, dass "working lunches" hier nicht üblich ist) 		<ul style="list-style-type: none"> Zustimmung der TN 	
3	Termine behalten: Option für Folgetermine anbieten, für diejenigen, die mehr darüber diskutieren wollen	Nicht bevorzugt, nur wenn da genug Interesse gäbe	<ul style="list-style-type: none"> Flexibler Evtl. mehr Motivation 	<ul style="list-style-type: none"> optional = weniger Teilnahme? nicht repräsentative Daten - nur von denen, die sehr motiviert zur Reflektion sind Evtl. nicht genug TN, um ergiebige Reflexion durchzuführen Wenn die Folgetermine auch kurz sind - kann die Erfahrung etwa fragmentiert sein - manchmal brauchen solche Diskussion eine gewisse Anlauf 			
4	Termine zurückziehen und neue, längere Termine (jeweils 2-3-stündige WS) finden	Nicht wirklich machbar, ich habe in den Kalender geschaut und es gibt wenig Optionen, die für jeden passt (es gibt aber schon welche)					
5	Termine zurückziehen: nur individuelle Befragung	Nicht empfehlenswert, passt nicht so ganz zu meiner Forschung, weil ich die Gruppenprozess untersuchen will, und die Diskussion ist ein wichtiger Teil davon	<ul style="list-style-type: none"> Einfacher zu organisieren 	<ul style="list-style-type: none"> Daten weniger hilfreich für das Projekt und meine MA Evtl. viel mehr Arbeit für mich, aber weniger Austausch für das Team 			
6	Termine zurückziehen: nur WS mit PM (van, Christof, David T.)	Nicht empfehlenswert - Ivan ist bis ende August im Urlaub (sehr spät für mich), und die Perspektiven sind evtl. zu auf PM Ebene nur	<ul style="list-style-type: none"> Einfacher zu organisieren 	<ul style="list-style-type: none"> Datensammlung zu einseitig und zu spät für meine MA Ggf. für die jetzige TN irritierend 			
7	Kombi - ersten Termin behalten (Intro mit den TN) dann fragen, ob sie die restlichen Termine behalten wollen, oder neue, längere Termine zusätzlich oder als Ersatz vereinbaren wollen <ul style="list-style-type: none"> Ergänzung von Absprache mit Christof/Renate: nach 30 Minuten Verlängerung fragen 	Minimal behalten wir die Termine, wie sie sind, sonst hätten wir die Möglichkeit, das zu erweitern, wenn da Kapazität und Interesse gibt	<ul style="list-style-type: none"> Partizipative Entscheidung Ggf. mehr Akzeptanz für die Lösung Transparenz - die Probleme offenlegen Chance für bessere Struktur / Ergebnis Entscheidung erst nach der Erfahrungen von dem ersten WS 	<ul style="list-style-type: none"> Planungsunsicherheit für mich Evtl. Präferenzkonflikte zwischen TN Evtl. keine Moderationskapazität 	<ul style="list-style-type: none"> TN sind offen für eine Mitgestaltung / Mitsprache 	<ul style="list-style-type: none"> Ganz klar am Anfang erklären - Mitgestaltung des Prozesses von den TN Der Prozess an sich ist auch iterativ 🔄 	<ul style="list-style-type: none"> Bessere Planungssicherheit für die TN und mich

Figure 10: Documentation of Design Decision for Reflection Sessions in Confluence

Appendix B4: Questions for the intervention

The intervention questions were based on Kolb's Reflective Cycle method in the handbook "Reflection Methods: Practical Guide for Trainers and Facilitators" by Wageningen Centre for Development Innovation, Wageningen University and Research (Gordijn et al., 2018, p. 70). In addition, I took questions that I found to be relevant from the following additional sources, especially including reflections that bring to awareness to and question underlying assumptions. For example,

- From Smith (2009, p. 42), e.g.,
 - What do my practices say about my assumptions, values and beliefs?
 - Where did these ideas come from?
- From Deloitte Insights (Reflect More to Learn Faster, n.d.), e.g.,
 - What has prevented us from accomplishing our goal?
 - What worked better than expected?
 - What didn't work as expected?
 - What assumptions need to be changed?
 - What strengths can we build on to ratchet up the impact?
 - To what extent is the current process holding us back from achieving more?
- From Bourner (2003), e.g.,
 - What other options did you have at the time?

Concrete experience (What)

Original question in English	Translation into German
<ul style="list-style-type: none"> • What was planned? What was expected? • What happened? <ul style="list-style-type: none"> ◦ What worked better than expected? ◦ What did not work as expected? • Describe the situation – what was observed, what was said, who was in the discussion, etc. • Which decisions were made and how? By whom? • What knowledge was applied in this situation? 	<ul style="list-style-type: none"> • Was war geplant? Was waren die Erwartungen? • Was ist eigentlich passiert? <ul style="list-style-type: none"> ◦ Was hat besser funktioniert als erwartet? ◦ Was hat nicht wie erwartet funktioniert? • Beschreib die Situation/Kontext - was wurde beobachtet, wie war die Stimmung, usw. • Welche Diskussionen wurden geführt? • Wer war dabei in welcher Rolle? • Welche Entscheidungen wurden getroffen und wie? Von wem? • Welche Methoden / Fähigkeiten oder Kenntnisse wurden in dieser Situation angewendet?

Reflective observation (Why)

Original question in English	Translation into German
<ul style="list-style-type: none"> • Why was there this discrepancy between our expectations and the reality? • What has prevented us from accomplishing our goal? • What other alternatives were identified/considered at that time? Why were they discarded? • In retrospect, what else would have been possible? • Could we have prevented this based on what we knew at that time? <ul style="list-style-type: none"> ◦ If so, why was it not possible to prevent that? ◦ If yes, why were we not aware of it? What led to this "blind spot"? • What do our practices say about our 	<ul style="list-style-type: none"> • Warum gibt es diese Diskrepanz zwischen Erwartung und Realität? • Was hat uns daran gehindert, unser Ziel zu erreichen? • Welche anderen Alternativen wurden zu dem Zeitpunkt identifiziert/erwogen? Warum wurden sie verworfen? • Was wäre im Nachhinein noch möglich gewesen? • Hätten wir dies mit unserem damaligen Wissen verhindern können? <ul style="list-style-type: none"> ◦ Wenn ja, warum war es nicht möglich, dies zu verhindern? ◦ Wenn nicht, warum waren wir uns dessen nicht bewusst? Wie kam es zu diesem "blinden Fleck"? • Was haben unsere Handlungen über unsere

<p>assumptions, values and beliefs?</p> <ul style="list-style-type: none"> ◦ Where did these ideas come from? ◦ What social practices are expressed in these ideas? ◦ What is it that causes me to maintain my theories? ◦ What views of power do they embody? ◦ Whose interests seem to be served by my practices? ◦ What is it that acts to constraint my views of what is possible? <ul style="list-style-type: none"> • To what extent is the current process holding us back from achieving our desired outcome? • To what extent do our actions reflect our values and goals in the project? 	<p>Annahmen, Werte und Überzeugungen ausgesagt?</p> <ul style="list-style-type: none"> ◦ Woher stammen diese Vorstellungen? ◦ Welche sozialen Praktiken kommen in diesen Vorstellungen zum Ausdruck? ◦ Was veranlasst uns, an unseren Annahmen festzuhalten? ◦ Welche Vorstellungen von Macht verkörpern sie? ◦ Wessen Interessen scheinen durch unser Handeln bedient zu werden? ◦ Was schränkt unsere Vorstellungen von dem, was möglich ist, ein? <ul style="list-style-type: none"> • Inwieweit hindern uns die gegenwärtigen Praktiken (wie die Arbeit erledigt wird) daran, die gewünschten Ergebnisse zu erreichen? • Wie spiegeln sich unsere Ziele und Werte (z.B. Leitgedanken, etc.) im Projekt in unserem Handeln wider?
--	--

Abstract conceptualization (So what)

Original question in English	Translation into German
<ul style="list-style-type: none"> • What can we learn from this experience? • Do any assumptions or beliefs need to be changed? • What could the implications if we were to apply these learnings in practice? • Who else could benefit from this learning? • In which other situations could these learnings be transferable? • What types of requirements would they have in order for this learning to be applicable? • What could the implications of this learning be for the project and your department or the City of Freiburg? 	<ul style="list-style-type: none"> • Was können wir aus dieser Erfahrung lernen? • Müssen irgendwelche Annahmen oder Überzeugungen geändert werden? • Was wären die Auswirkungen im Projekt, wenn wir die Erkenntnisse aus der Erfahrung in der Praxis anwenden würden? • Wer könnte sonst noch von diesem Lernprozess profitieren? • In welche Situation wäre dieses Learnings übertragbar sein? (z.B., Ist es nur in diesem speziellen Kontext des aktuellen Projekts anwendbar?) • Welche Voraussetzungen müssten erfüllt sein, damit das Gelernte angewendet werden kann? • Was könnten die Auswirkungen dieser Erkenntnisse für deine Abteilung/Amt oder die Stadtverwaltung sein?

Active experimentation (Now what)

Original question in English	Translation into German
<ul style="list-style-type: none"> • What should we do differently in the future? What would you do differently in the future? • Which lessons or ideas can we apply now? • Will we be changing any practices? • What strengths can we build on to increase the impact? • What does this mean if we were to apply this in practice? • Which questions do we still have and what actions will we take to explore them? • What questions could we ask / learning objectives should we have that would drastically increase the success of this project? • What could we share with others about this topic? How can we engage them? 	<ul style="list-style-type: none"> • Was sollten wir in Zukunft anders machen? • Welche Lessons Learned oder Ideen können wir jetzt im Projekt anwenden? • Werden wir irgendwelche aktuelle Praktiken jetzt ändern? • Auf welchen Stärken können wir aufbauen, um die Wirkung zu erhöhen? • Welche Fragen haben wir noch und welche Maßnahmen werden wir ergreifen, um sie zu erforschen? • Welche Fragen könnten wir stellen / welche Lernziele sollten wir haben, um den Erfolg dieses Projekts zu steigern? • Was könnten wir mit anderen über dieses Thema teilen? Wie können wir sie einbinden?

Appendix B5: Input for the intervention regarding dialogue

In an attempt to encourage critical reflection on underlying assumptions and mental models, I provided the following input at the start of the the workshop held on August 15, prior to the group reflection.



Figure 11: Input for August 15 Workshop Regarding Dialogue

Appendix B6: Participant list with attendance

Table 30: Participant List with Attendance

[Redacted for data privacy per agreement with participants]

Appendix C: Relevant Raw Data

Data that I directly refer to in this thesis, such as original German quotes that I translated into English, are listed here, including the quote segment where the quote was made, if possible.

Excerpts from the transcripts are presented chronologically with corresponding timestamps. Note that timestamps denote a later segment of the transcript, meaning that there were comments that were skipped in between.

Appendix C1: Learning context preparatory interview - Selected passages from the transcript

00:47 - Was ist dann die Vorstellung vom Lernen aus Sicht des Projektmanagementteam?

P1: Vorstellung von Lernen – **wir bearbeiten in diesem Projekt Themen, die nicht bekannt oder teilweise bekannt sind. Wir nutzen die Methodiken, die wir noch nie oder nicht angewandt haben. Wir verwenden die Vorgehensmodell, jetzt gerade Richtung Vergabe, die auch nicht gemacht worden bisher, wir nutzen die Systeme, die bisher auch nicht angewandt worden. Und das alles setzt voraus, dass sich diese ganzen Systemen, Methoden, Vorgehensweise, kennenlernen und lernen muss.** Und die Vorstellung von Lernen, ist meiner Meinung nach hier die Bereitschaft und die Offenheit, um diesen neuen Dingen oder die Dingen die vielleicht auch nicht neu sind aber anders sind als die bisherigen... oder was ich in bisherigem Arbeitsleben so kenne, also die Bereitschaft, das zu antizipieren, zu lernen, zu...das auch als eigene Kompetenzen Erweiterung und Fähigkeiten Erweiterung zu verstehen und für die, nicht nur für dieses Projekt sondern auch für weitere Projekte anzuwenden.

P2: Geht eigentlich in die ähnliche Richtung. Also wir sind hier als Projektmanagement genauso Teil von diesem Lernprozess und haben wir - wir haben einfach erkannt, schon in der Antragstellung und beim start vom Projekt, dass es so komplex ist, so schwierige Fragenstellung beinhaltet, und wir da eigentlich sowohl methodisch als auch fachlich als Team dazu lernen müssen, um da überhaupt das bewältigen zu können. Und fachlich dazu lernen müssen wir sowieso alle - das wäre wahrscheinlich bei jedem anderen Projekte auch so, aber hier ist eben noch dazu die Notwendigkeit auch methodisch und vom Ansatz her dazu zu lernen, einfach weil es so ein komplexes, offenes, innovatives Projekt ist und nicht klar ist, wo die Reise hingehen soll und da eignen sich halt einfach andere Methodiken besser als so klassische Vorgehen um eben ja, das Richtige zu tun, um nicht in die typische Probleme reinzulaufen wie man schreibt Monate lang an Papieren und arbeiten eigentlich am Problem vorbei und dafür eben diese Methodiken mit viel kürzerem Züglen mit viel iterativeren Vorgehen, wo wir hoffentlich früh Fehler erkennen, daraus lernen können und am Ende ein besseres Ergebnis kriegen. Ich glaube, das ist halt nötig in so einem komplexen Projekt. Aber im Prinzip Ähnliches wie Ivan gesagt hat.

04:15 - Gibt es dann eigentlich aus eurer Sicht auch, was man nicht als Lernen bezeichnen würde. Z.B. Gäbe es schlechte Beispiele vom Lernen dann aus eurer Sicht?

P1: **Ja, die Lernerfahrungen können schon schmerzhaft sein.** Aber schlecht würde ich das jetzt nicht bezeichnen also im Sinne von Nonstop Learning. Egal wie schmerzhaft das ist. Also das braucht man. Es ist... braucht Anstrengung. Aber auch das Thema Fehlerkultur jetzt ist auch ja, weiß ich nicht, ob das schlecht ist, aber mir fällt jetzt irgendwie nichts ein.

07:19 – wie funktioniert der Lernprozess?

P1: Da gibt es auch jetzt unterschiedliche Sachen, wenn ich jetzt an eine - jetzt nehmen wir das Thema Wissensmanagement zum Beispiel. Also, wir nutzen hier nicht nur ein neue System für die meisten Beteiligten, sondern auch die Art und Weise, wie wir damit umgehen, um Wissen zu dokumentieren. Und im ersten Aufschlag haben wir eine kurze Einführung, Einleitung gemacht und [unintelligible] das den Beteiligten überlassen, Also das Wissen zu dokumentieren. Da gab es schon eine oder andere Hinweis oder Regeln, aber nicht explizit und erst später haben wir gemerkt, okay, wir brauchen mehr Regeln mehr Unterstü...also Regeln mussten auch nicht als Regeln verstehen sondern als Unterstützung als Hilfestellung und dann haben wir sozusagen in diesem iterativen Prozess also wie funktioniert Lernen auf die Frage - hier würde ich auch sagen, eher Learning by doing. Im Prinzip in dem Prozess, wir sind ständig am Optimieren. Und so haben wir jetzt die Regelwerke, die Regeln aufgesetzt, die für die Nutzung der Confluence oder Jira sozusagen beinhalten aufgestellt. **Und ansonsten funktioniert auch oft bilateral – also in Einzelgesprächen, wo es kurz erklärt wird, wie was funktioniert oder zum Beispiel Vorteile von irgendetwas ist.** Also diese persönliche Kontakte, da läuft ziemlich viel würde ich sagen. Aber wir haben meine ich jetzt kein strukturiertes konzeptionelles Vorgehen für das Thema Wissenstransfer. Allerdings ist das auch Aufgabe auch formuliert und dekliniert, aber wie das so funktionieren soll, es ist noch, gibt es keinen genauen Plan bisher.

P2: Ja, vielleicht um anderes Beispiel zu nennen. **Ich erinnere ganz gut, ziemlich an dem Anfang vom Projekt, wo wir überhaupt erst mal die Use Cases versucht haben, so ein bisschen zu finden und dann eben auch User Story**

für die Use Cases haben wollen, das war zum Beispiel auch so ein Prozess, da waren noch nicht ganz so viele Leute sage ich mal im Projekt aber auch das war schon ein bisschen schwer zu erklären, warum man diesen Aufwand sozusagen macht, man weiß doch eigentlich was man machen möchte, aber im Endeffekt haben sich dann doch alle darauf eingelassen, das war glaube ich auch gut so, und das haben wir größtenteils würde ich sagen im Workshops gemacht, wir haben natürlich auch auf Confluence unsere Definition so ein bisschen hinterlegt, das jeder die Begrifflichkeiten dann immer wieder auch mal nachgucken kann, was ist jetzt User Story überhaupt, müssen wir tatsächlich immer wieder erklären, wo da der Unterschied ist - Use Case, User Story, und dann gemeinsam entwickeln und das in so einem Workshop zu machen, wo man dabei auch ein bisschen diskutieren kann, war glaube ich ganz gut, das vielleicht auch so ein weiteres Beispiel also in Workshops wird auch viel gemeinsam gelernt.

11:17 – Was wird dann genau gelernt?

13:20

P1: Also mir fällt noch das Thema Kultur ein. Also das ist auch so. Und eben, das ist schon die Frage, kann man Kultur erlernen. Oder wie jetzt bin ich mir selbst auch nämlich nicht sicher. Ich meine wenn man schaut, **wir wollen eine Umgebung bauen, dass Lernen stattfinden kann, quasi ungestört, oder Rahmenbauen, wo diese Kultur Change auch stattfinden kann.** Allein eben das Thema Selbstständigkeit und selbstständig arbeiten – also das muss man auch lernen. Wie funktioniert das. Es ist so, wenn ich jetzt das ganze Arbeitsleben immer die Aufgaben von oben bekommen habe und jetzt wird es gefordert, überlegt welche Aufgabe wichtig sind. Das funktioniert, nicht in dem ich das sage, sondern muss auch eben erlernt werden. Das ist mir so was einfällt und auch diese ganze Thema, ich habe jetzt hier bei mir die Leitgedanken aufgemacht. Bin ich auch Christof hat das Thema Nutzerschaft und Wirksamkeit angesprochen. Aber auch Thema Beteiligung, Gemeinwohl, also Flexibilität, und Nachhaltigkeit von den Lösungen, oder Arbeit die wir tun, also auch zum Beispiel **an einem Konferenz teilnehmen.** Oder Vortrag halten. Wenn ich etwas davon habe. Oder wenn das Ganze, diesen Umgang ist nicht selbstverständlich, das bedarf auch eine Offenheit, eine Bereitschaft, das zu sehen, zu verstehen, zu lernen, zu antizipieren insgesamt.

16:18 – wer lernt?

P2: Und ja, wer bringt jetzt sozusagen Inputs rein, Anstöße, um irgendwo was dazu zu lernen. Ich glaube, das kann unterschiedlich sein. Das kommt schon teilweise wahrscheinlich auch von uns aus dem Projektmanagement oder z.B. vom David mit seiner festen Rolle als DSDM Coach, agile Coach, der vielleicht für das Thema zuständig ist. Aber es kommt natürlich auch von Außen. **Also wir haben uns da immer wieder Unterstützung geholt oder sind selber auf Fortbildung und dann bringen wir es halt sozusagen indirekt wieder rein.** Also natürlich auch viel von Außen, weil wir eben auch selber empfänger sind. Und genauso kann aber auch, lernen wir auch von alle anderen Akteuren, dann z.B. auch mal fachlich natürlich viel. Aber es ist ja auch nicht so, dass die anderen auch methodisch oder anders irgendwo nicht auch uns was beibringen können, also das gibt es natürlich auch.

17:20

P1: Ja, kann ich das nur unterstreichen. Also was jetzt an mir schaue, also was da die Lerneffekten sind, also sowohl sachlich, fachlich, methodisch, organisatorisch. Also das ist jede Menge, die Lernkurve ist ziemlich steil momentan. Und genau. Das ist das spannende übrigens im Projekt so, was ich [unintelligible], weil wenn ich jetzt an die Zeit davor denke, war eher so stagnieren und genau die Lernkurve und da kommt da genau. Aber eben. Das ist auch so Thema. Es gibt ja die Menschen, also das Thema Bereitschaft und Kraft haben um zu lernen, es ist auch keine selbstverständlich und das muss man auch verstehen. Also dass die Manche nicht lernfähig sind, und dafür gibt es die Gründe. Und also man darf nicht voraussetzen, ja alle wollen jetzt was lernen. Sondern es braucht sozusagen eine Umgebung, dass Lernen stattfinden kann. Und ja das ist so ja diese Umgebung, diese Sicherheit, ich weiß nicht, das Wort habe ich neulich das Thema psychologische Sicherheit oder einfach Sicherheit so an sich, dass ich auch ungestört lernen kann, das ist auch so ein Thema, es braucht einfach nahrhaften Boden, dass das Lernen so passieren kann.

28:37 – wo findet lernen statt?

P2: Ja, kann ich auch zustimmen, was glaube ich auch halt einfach wichtig beim Lernen ist sozusagen wiederholen und selber anwenden. Wenn wir da irgendwie ob das jetzt extern oder wir vom Projektmanagement irgendwas erzählt, berichtet, bringt erstmal nur begrenzt. Das muss wirklich von den Leuten selber ausprobiert werden, selber angewandt werden. Oder echt auch wiederholt werden, damit sich [unintelligible] also das, na, bei solchen Tools ist es ganz eindeutig. Jira oder so lernt man nur wenn man auch wirklich selber damit arbeitet. Aber das gilt eigentlich genauso für Methoden oder andere Kompetenzen. Und das kann dann mal gemeinsam in dem Workshop sein aber das kann durchaus auch selber selbständig am Arbeitsplatz sein. Aber eben Aktiv, **also derjenige, diejenige muss es selber ausprobieren, anwenden, bis es wirklich, ja erlernt ist sage ich mal.** Nur noch als Ergänzung. Aber das ist immer so beim Lernen eigentlich.

29:54 – wann findet lernen statt?

P1: Nachts [lacht]

P1: Also ich finde jetzt oft, klar, es passiert, also es ist mein Eindruck, dass es **so diese Aha Effekt, oder im Prinzip, du hörst was, und dann Gehirn bearbeitet das irgendwie, und erst im Nachhinein kriegt man sozusagen diese Lampe geht es an und lernen hat stattgefunden**. Also es braucht sozusagen so ein Moment von dem Hören oder Lesen bis zum wirklich so Verständigen und das was Christof gesagt hat, diese Wiederholung, das ist auch entscheidend, also es reicht oft nicht, einmal was zu machen und dann habe ich das gelernt. Es braucht diese Wiederholung, Verständigung. Und genau, das so was was mir so einfällt.

31:10

P2: Ja habe ich jetzt tatsächlich auch nicht so viel zu ergänzen glaube ich. Also das Wann ist sehr unterschiedlich. **Ich glaube auf jeden Fall zeitversetzt vom Moment, wenn man es sozusagen das erste Mal hört, und dann kann es unterschiedlich sein. Entweder wenn man selber was ausprobiert kann oder sich einstellen, oder eben tatsächlich auch mal Nachts oder bei einem Spaziergang** oder so, so ein Aha Effekt, wie Ivan das beschrieben hat. Das ist glaube ich echt unterschiedlich aber auf jeden Fall zeitversetzt zum Input, meistens.

39:21 – Beispiel, wo das besonders schwer war, Lernen zu ermöglichen?

P1: Eins fällt mir da auch, ich weiß nicht, ob es wirklich zu der Frage passt, aber ich war auch so, ein Lerneffekt von mir. Also wir haben dieses Fortbildungsprogramm bei der Stadt. Das sind ja auch keine Ahnung über hunderte Lernangebot. Von Methodik, fachlich, über interkulturell, gender, alles Mögliches da drin. Und das guckt sich jeder an und entscheidet so, das mache ich, durch dieses Thema Neugierde, Motivation angeboten. Ich habe eher, meine Vorstellung war, das reicht nicht aus, einfach das anzubieten, und zu sagen, okay, guckt euch das an, und dann gar nicht zu schauen, okay, was braucht wer, um überhaupt teilzunehmen, oder zu verstehen, warum das jetzt wichtig ist. Vorhin hatte Michael das Thema Data Science vorgestellt. Und auch alle Möglichkeit, die es dort gibt. Und wenn ich das nicht weiß, dann komme ich nicht auf die Idee, das sowas zu lernen. Und dann genau, es reicht nicht nur, diese allen Angebot zu machen, die auf Freiwillige Basis passiert, oder vielleicht doch, ich weiß das nicht. Also das ist so ein bisschen wo ich eigentlich für mich auch ein Fragezeichen habe. Aber entweder ein oder das andere Extrem funktioniert nicht, das glaube ich nämlich, und wir brauchen eine Mischung von Freiwilligkeit bis zum Rahmen schaffen, dass das Lernen stattfinden kann und das auch wenn **es bedeutet jemand vielleicht im Gespräch beraten und überlegen, okay, was sind die meine Lernziele, wie komme ich zu diesen Lernziele, habe ich überhaupt Zeit zum Lernen, wie will ich mich weiterentwickeln, und wie kann ich das evaluieren**. Also, das sind die wirklich die Fragestellungen, die glaube ich differenzierte angeschaut werden müssen und nicht alles durch einen Kamm schieben oder Sieb drücken. Weil da, da blieben viele irgendwie hängen.

43:36 – Verknüpfung zwischen Lernen im Projekt und die breitere organisatorische Kontext?

P1: Ja aber das ist eben wieder diesem Punkt - wir brauchen ein Plan, bin ich der Meinung. Und wie ich jetzt so David und Daniela verstehe, die sind dann diesen Plan daran und da bin ich jetzt auf dem ersten Aufschlag gespannt. Habe gestern mit ihm auch gesprochen. Und ich habe schon Erwartungen jetzt schon in deiner Arbeit, die du jetzt machst, das wir von dort auch wirklich einen guten Impuls bekommen, die wir dann in diesem Plan berücksichtigen. Und was auch noch, genau, ich habe Fortbildungsprogramm auch erwähnt. Also wir haben auch ein Einheit bei der Stadtverwaltung, die sich mit diesem Thema auseinandersetzt. Also Fortbildungen in Programm und Fortbildungsmanagement sozusagen. Da steht es auch einen Termin aus ??? und ich bin mir nämlich, ich glaube wir sind da auch ein bisschen schwach in dem Feld. Weiß ich nicht wie wir uns da noch von externen Unterstützungen holen sollen, um das Thema ein bisschen zu vertiefen oder zu, was bedeutet professionalisieren aber zu konkretisieren. Genau, was wollen wir, eben, das habe ich auch nicht gesagt, lernen **wir schaffen in diesem Projekt ganz viele Blaupausen, so viele anderen, und das ist auch so, das sind da ständige neue Entdeckungen auf einer Entdeckungsreise**, und das fordert einfach Ressourcen, und Zeit und das bleibt weniger für ja inhaltliche Beschäftigung mit dem Thema, aber offensichtlich gehört es auch dazu.

Appendix C2: May 23 workshop - Selected survey responses

1. Was verstehst du unter "Lernen" im Rahmen des Projektes? Wie würdest du es definieren oder charakterisieren? Kannst du bitte einige Beispiele nennen?

Lernen bei uns im Projekt spiegelt sich in unterschiedlichen Aspekten wieder:

- Prototyp --> Lernen wie eine Plattform aufgebaut werden kann, wo Fehler gemacht werden können, was muss alles berücksichtigt werden
- Weiterbildung von Mitarbeitenden: Mitarbeitende in Ihren Gebieten weiterbilden. (Bspw. Agile Coach)
- Lernen aus Fehlern --> Retrospektiven, POPCORN-Flow - zieht auf eine bessere Zusammenarbeit im Projekt ab

Lernen mit den Herausforderungen, d.h. sich die Skills anzueignen, die man nicht beherrscht z.b. Projektmanagement jira, neue Vergabeformen, aber auch Methodenkompetenz (Public Service Design)

Lernen ist weiter kommen im Rahmen der Projektarbeit im beruflichen Kontext. Lernen sind neue Erkenntnisse die gewonnen werden und wenn diese erfolgreich wieder eingesetzt werden. Im Teilen bedeutet Lernen auch eine Veränderung im Positiven. Lernen ist mit Erfahrungsgewinn verbunden und ist hilfreich um Komplexe Themen mit den wir uns beschäftigen besser zu verstehen. Beispiele: neue Methoden und Vorgehensweisen lernen, Fachwissen sich Eineignen, Zusammenarbeit mit einzelnen Kolleginnen und Kollegen (Umgang mit einander lernen).

-

Inhaltlich gibt es viel zu lernen, aber auch Methodenkompetenzen sind bei dem komplexen Projekt zentral. User Stories/Use cases nutzerzentriert. DSDM zb. Auch Tools "richtig" einsetzen will gelernt sein.

3. Welche Hindernisse oder Herausforderungen gäbe es beim Lernen aus dem Projekt? Kannst du einige Beispiele nennen?

Motivation der Mitarbeitenden, Psychologische Sicherheit (Fühle ich mich wertgeschätzt und wird meine Meinung gehört), Fehlerkultur... leider nicht stark ausgeprägt in der Stadtverwaltung, Informationsmangel

hierarchische Strukturen in der Verwaltung stellen Hürden dar, schnell und unkompliziert Dinge auf den Weg zu bringen. Zu wenig zeitliche Ressourcen durch Alltagsgeschäft. Dadurch verschieben sich ständig die Prioritäten. Lernen aus dem Projekt wird deshalb nicht aktiv formuliert, da keine Zeit für "lessons learned" (nicht nachhaltig)

Bereitschaft/Offenheit zu lernen ist nicht immer gegeben, Zeit fürs Lernen ist ein Grund, aber auch Akzeptanz dass "man nicht alles weis", es gibt keine Systematik bzw. gezieltes Lernen, diese kann ich nicht erkennen, Fehlerkultur ist nicht immer gegeben.

-

Überforderung mit zu viel neuen Tools + Methodik

Figure 12: Selected Survey Responses for the May 23 Workshop

Appendix C3: May 23 workshop - Selected workshop outcome



Figure 13: Selected Workshop Documentation from the May 23 Workshop

Appendix C4: June 27 workshop - Selected survey responses

10. Was sind deiner Meinung nach die größten Hindernisse, die den Lernprozess von agilen/prototypischen Ansätzen behindern?

Unterschiedliche Vorstellungen der Geldgeber (Politik) und Fachexperten; Akzeptanz der Allgemeinheit im Falle des Scheiterns -> Umsetzung der Prototypen sollte daher realistischen Anforderungen standhalten und nicht komplett losgelöst von der Realität erfolgen.

Führungskräfte sind sehr an schnellen Lösungen interessiert. Da besteht die Gefahr, dass notwendige Iterationen nicht gemacht werden. Es wird zu wenig getestet bzw. das drängendste Problem nicht gelöst, weil die Nutzer unzureichend einbezogen werden

keine Bereitschaft für lernen, aber auch keine Zeit dafür. Falsche Priorisierung der Aufgaben.

Personalkapazität!

Befindlichkeiten verschiedener Dienststellen - Beharren auf Zuständigkeiten und Entscheidungsbefugnisse durch Führungspersonal, Amtsleitungen. Starre Regeln, Bürokratie, Abläufe in der Verwaltung

11. Stellst du dir vor, du hättest die idealen Voraussetzungen dafür - wie würde ein solcher Prozess funktionieren, um das Lernpotenzial aus der prototypischen Phase zu maximieren? Wie würde ein solcher Prozess aussehen und wie würde er gestaltet werden?

Ideale Voraussetzung: wenig bestehende Abhängigkeiten von diversen (alten) Fachverfahren; ein Prozess mit folgenden Eigenschaften: hohe fachl. Heterogenität, offene Standards, hohe Automatisierung, ohne Knowhow bedienbar, Adaptierbarkeit auf andere Prozesse, Datenschutz geklärt, Skalierbarkeit

in der Theorie kennen wir sämtliche methodische Ansätze die es braucht. Ideale Voraussetzung wäre es genügend Zeit zu haben, die einzelnen Schritte auch wirklich zu gehen

bei allen Beteiligten - die Prototypphase so wie geplant durchführen ohne 3+ weitere Projekte die parallel bearbeitet werden müssen. Fokus auf Prototypphase!

Insbesondere die Reservierung der erforderlichen Personalkapazität halte ich für essenziell. Wenn Mitarbeitende keine Zeit in ein Projekt investieren können oder dürfen, entwickelt sich ja kein Lernpotenzial.

das aktuelle Prototyp-Verfahren analysieren: Inwieweit wurden die formulierten (Zwischen-)Ziele erreicht? Welche nicht / nur teilweise? Warum nicht? Was war gut, was hat gefehlt? Welche Änderungen muss ich vornehmen, damit ich den nächsten Prozess erfolgreicher gestalten kann?

Es kann da jetzt einige Überlegungen anstellen, wie man es da ändern kann, um das Lernpotenzial aus dieser prototypischen Phase für die produktive Phase zu maximieren?

Externe Abhängigkeiten minimieren (Zeitfresser) oder Zeitfenster verlängern für die Umsetzung; explizite Nutzung einer standardisierten Prozessbeschreibungssprache zur technisch exakten Beschreibung von Inputs, Outputs und des Prozesses selbst (ADEPT, WPS, BPMN)

um das gut beantworten zu können, müsste ich tiefer einsteigen, was mir aus Zeitgründen ;-) leider nicht möglich ist

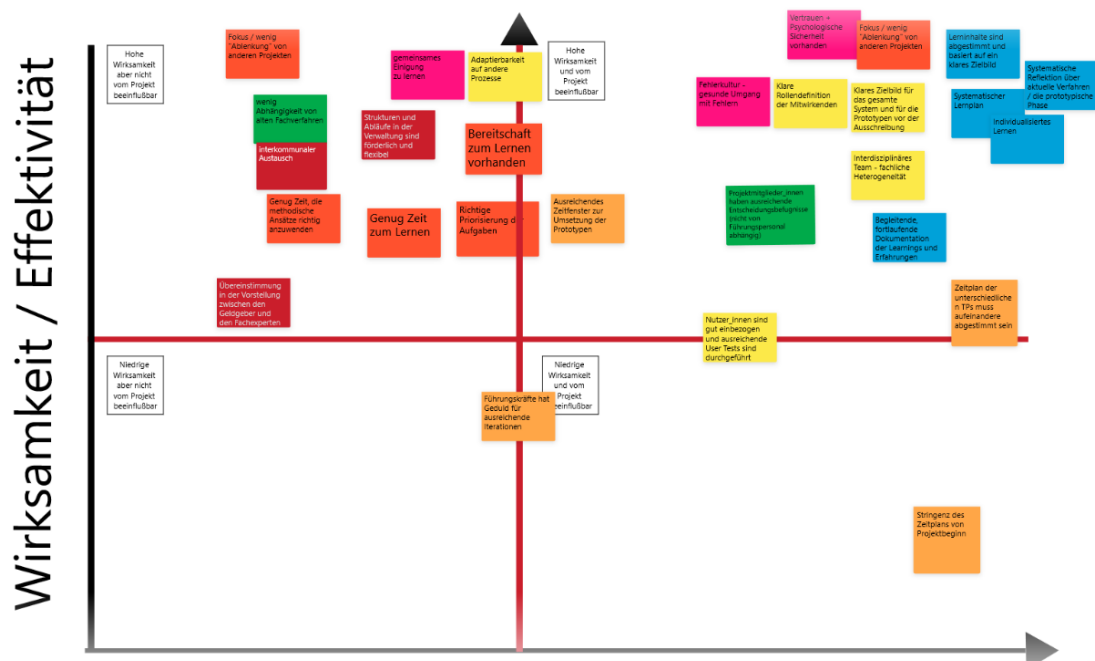
Während der Prototypphase nur die Arbeiten die dafür notwendig sind durchführen und keine weitere Projekte

Das DIGIT muss aus meiner Sicht verdeutlichen, wie viel Personalkapazität (Zeitaufwand etc.) sind von den Projektbeteiligten erwartet. Die bisherige agile Arbeitsweise konfliktiert mit den Vorgängen innerhalb der Stadtverwaltung.

begleitende fortlaufende Dokumentation der positiven und negative Eindrücke während des gesamten Verfahrens, damit die Learnings und Erfahrungen nicht verloren gehen.

Figure 14: Selected Survey Responses for the June 27 Workshop

Appendix C5: June 27 workshop - Selected workshop outcomes in Conceptboard



Appendix C6: Aug 1 Reflection session - Selected passages from the transcript

22:02

M1: Und würde ich jetzt gleich mal die direkte Frage an euch richten. Wie war dann eure Erfahrung mit der Auswahl der Prototypen, der Auswahl der Use Cases für die Prototypen. A) Seid ihr zufrieden damit? Seid ihr zufrieden mit dem Ergebnis? Seid ihr zufrieden mit dem Prozess? Wo hat es gehardet?

P8: Zudem Zeitpunkt wollte ich eigentlich meine Projektbeteiligung dann eigentlich wieder aufcanceln. So viel vorweg.

M1: Als der Use Case Auswahl stattfand?

P8: Bei der Auswahl der Prototypen, ja. Das hängt jetzt zusammen mit der Use Case Bewertung. Weil wir wurden in TP ja aufgefordert, die Use Cases zu erarbeiten gemeinsam, das war ein guter Prozess, der auch da unterstützt wurde in Dialog. Also es war gut in den Rahmenbedingungen, die halt zu einer Ämter Kooperation mit Ämter die nicht wirklich kooperieren wollen usw. Na. Also ihr kennt die ganze Dinge. **Aber dann wurden die bewertet, und dann war so ein Punkt, der echt frustrierend war, weil die Beurteilung dann irgendein [unintelligible] wo Punkte geteilt wurde, wo die TP keinen Einfluß mehr hatten, wo ich mich immer sehr gewundert habe, dass dann über Mobilität, über die Wichtigkeit bestimmter Dinge beurteilt wurde von Personen, die mit den TP nichts zu tun hatten, und die auch mit dem Thema Mobilität nicht so befasst waren eigentlich.** Und dann wurde diese Bewertung weitergegeben an die Lenkungsgruppe, die dann ja eine Auswahl getroffen hat, und dann war Friss oder Stirb so so ein bisschen, na, also nicht dass es, dass ich irgendwie Probleme hätte, mit den ausgewählte Prototyp, aber der Prozess an sich, an dem [unintelligible] beleuchtend ja, fand ich damals nicht wirklich schön.

24:18

M1: Okay kannst du noch genauer benennen, warum? Und du kannst es aufschreiben? ...Weil du das Gefühl hattest, dass du übergangen wurdest mit der Bewertung? Oder weil du das Gefühl hast...

P8: [unintelligible] ...ja genau. Die Erwartung war, dass wir als Fachexperten bei der Beurteilung der Use Cases ein gewichtiges Wort haben, dass da genau, dass die Kommunikation schwierig war, und dass auch mit von extern bewertet wurde, wir haben damals Virtual Identity, deren Legitimation in der Bewertung mir dann irgendwie nach wie vor oder Babel war das na, der da mitbewertet, ich weiß es nicht..

26:01

P6: Em, was mir gefehlt hat, am ersten Schritt war eine Zielvorstellung für das gesamte System. Deshalb war mir auch die Bewertungskatalog für die Prototypen war mir dann auch fremd, wenn wir die Gesamtquoteline gefehlt hat. Und das fehlte mir die Orientierungspunkt, was soll überhaupt entstehen und wie ordnet sich die Prototypen in diesem Gesamtziel unter. Von daher ist mir das jetzt sehr willkürlich vorgekommen. Und dann natürlich auch das System der Auswahl, bei der am Schluss nochmal die Lenkungsgruppe steht, die fachlich überhaupt keine Ahnung hat, war mir auch sehr fremd.

M1: Mm hmm, was meinst du genau mit das war dir fremd?

P6: Das hielt ich für falsch. Ich halte es für falsch, dass man politische Entscheidung trifft, und nichts anderes ist es, wenn eine Lenkungsgruppe entscheidet, die von technisch, fachlich erstens keine Ahnung hat und zweitens, das Zielbild nicht kennt, weil es nicht da ist. Da ist einfach eine wichtige Entscheidungsgrundlage nicht da.

27:43

P2: Mach ich mal weiter. Sind zum Teil ähnliche Punkte, aber vielleicht ein bisschen anders. Ich finde es aber auch ganz spannend jetzt zu sehen, weil es gar nicht so einfach ist, das zu rekonstruieren, was man da eigentlich genau gemacht hat, da merkt man, dass man das zu wenig macht, dieses Reflektieren, aber okay. Ich habe versucht das so ein bisschen von hinten mal kurz [unintelligible] was eigentlich passiert ist, weil was ja passiert ist ist auf jeden Fall in der letzte Schritt hat die Lenkungsgruppe zwei von ich meine fünf oder, ich glaube fünf haben wir...

M1: Vier

P2: Vier waren es nur ja stimmt, vier glaube ich, ja okay. Erm zwei von vier haben die ausgewählt und davor haben wir vier ausgewählt, die wir denen geben, und diese vier kamen von einem Pool von [unintelligible] ... Und irgendwo da ist irgendetwas verloren gegangen. Wir haben das natürlich schon meiner Meinung nach begründet, wir hatten Erwartungen und auch einen Grund warum wir das so gemacht haben, aber das hat sich nicht so als nicht so ganz als richtig rausgestellt. Also dieses, dass die Lenkungsgruppe zwei von den vier auswählt ist meiner Meinung nach, so ein

politische Grund gewesen und wollte den halt irgendwie eine Rechtfertigung geben, dass es diese LG gibt. Aber das ist im Projekt nicht unbedingt also inhaltlich nicht unbedingt zuträglich gewesen. Ist auch meiner Einschätzung. Das heißt, da klappt es irgendwie so ein bisschen auseinander. Und hat eigentlich nichts zu dem eigentlichen Ziel von dem ganzen Prozess gepasst. Warum wir das gemacht haben, meiner Meinung nach war schon, weil wir gesagt haben, hier, wir brauchen unbedingt so eine Prototypphase, damit wir nicht gleich diese große Ausschreibung machen, und da eine Menge Fehler machen, sondern wir wollen da was irgendwas vorweg legen. Und irgendwas vorweg legen ist dann zu dieser Prototypphase geworden, wo wir verschiedenen Sachen lernen wollen. Wir wollten lernen über unsere Systemlandschaft, über unsere Zielvorstellung, die war damals noch nicht vorhanden, wir wollten die unter anderen dadurch ein bisschen konkreter kriegen aber man hätte wahrscheinlich auch davor schon mehr darein stecken sollen, um dann auch diesen Prozess klarer zu kriegen. Also ich glaube auch man hätte mehr über dieses Zielvorstellung von dem ganzen Prozess reden sollen. Ich schwanke wahrscheinlich auch teilweise ins Grüne gerade rein hier. Aber na ja. Die Use Cases selber zu erarbeiten finde ich hat noch gut funktioniert und dann aber diese Bewertung da schließe ich eigentlich auch Michael, jetzt haben wir zwei Michael, die beide Michael haben schon geredet. Aber ich schließe mich an, das war ein bisschen ... willkürlich, schwierig, mit einer Firma, die also das, die Firma nicht nur den Prozess begleitet hat und inhaltlich vorbereitet, sondern dass sie auch noch selber bewertet haben. Da bin ich mir auch ein bisschen unsicher, ob das so schlau war. Aber wir wollten das natürlich auch ein paar Köpfe verteilen. So im Sinne von umso mehr Leute bewerten, oder ein paar unterschiedliche Sichten bewerten, kommt was Besseres raus, aber das hätte man vielleicht auf andere Köpfe verteilen müssen. Was fällt mir noch ein?

31:54

P5: Das ist ja interessant die Frage wie die überhaupt auf Babel kamen. Ich weiß da gibt es ja Beziehungen in DIGIT, [unintelligible] ausführen zu wollen. Aber so was soll man in der Nähe Zukunft auch überlegen, wie man eine Beratungsfirma einbindet, warum, usw. Ansonsten stimme ich Michael voll zu, die beiden Punkte, bei dem Thema Einbindung der politischen Ebene. Ich halte davon auch eigentlich nicht nichts, aber ich weiß das war mal nötig, und Ivan war sicherlich dankbar, das machen zu können, von daher muss man sich einfach entsprechend vorbereiten, d.h. die Use Cases die zur Auswahl stehen dürfen alle keine Gefahr oder keine Relevanz haben für irgendwelche andere technische Entscheidungen sondern sollen quasi nur eine Entscheidungs Möglichkeit 32:38 vorgaukeln. Das ist für mich das was ich daraus lernen würde, weil man muss natürlich die politische Ebene hier und da einbinden, aber es muss eben entschärft, indem man die Auswahl entsprechend zu vorbereitet, dass nichts andere kann, sonst macht es auch keinen Sinn. Ja genau der andere Punkt auch. Wenn man kein Zielbild hat, das macht die Bewertung keinen Sinn, egal ob Fachexperte oder nicht. Also auch für mich war es nicht so richtig klar, auch wenn ich es wüsste, hier [unintelligible] Komponenten, wie man es genau bewerten soll. Aber man muss ja nicht genau was am Ende rauskommen sollen. Also ich wiederhole mich nur, brauche ich auch nichts aufschreiben wahrscheinlich, alle schon gemacht hat. Aber was Neues fällt mir jetzt auch gerade nicht ein, außer eben was man daraus lernen kann, was die Einbindung der politischen Ebene betrifft, dass man da entsprechend nicht [unintelligible] gehen kann, weil dann fehlt wo anderes vielleicht dann Unterstützung, sondern dass man eben das entsprechend zuvorbereitet, dass nichts [unintelligible] kann.

34:20

P6: Es gab nicht nur Zeitdruck sondern von seitens der Projektleitung gab es einfach ein Personalwechsel und es gab diese Denkschranke: Wir entwickeln keine Vorstellung, das müssen wir uns eine Firma zeigen. Das war damals Leitgedanke und das wurde auch so gelebt, in der Auswahl der Prototypen. Das war explizit von der Projektleitung so gewünscht, punkt. Deshalb war auch zu der Zeit habe ich von dem Projekt überhaupt nichts mehr gehalten.

41:43

P6: Zu dem Zeitpunkt, also wir sind ja vorgegangen, dass ich mache mal als Bild. ...Wir möchten eine Waschmaschine bauen und unser Ansatz war, wir können irgendwas nehmen, was zur Waschmaschine gehört und wir fangen an, mit einem Fuß unten und wir fangen mit der Abdeckung an. Und so haben wir angefangen, weil unser Ansatz war, es ist egal welche UC da sind, wir bauen aus ganz vielen UC, unser ganzes zusammen, war für mich so der Lerneffekt war, dass wir da einfach gesehen haben, dass das einfach auch nicht zielführend ist, wenn man gar nicht definieren, was ist repräsentativ. Das Thema repräsentative UC haben wir zu dem Zeitpunkt noch überhaupt nicht gehabt, sondern ein ganz andere Denkansatz.

44:54

M1: Ja, vielleicht kann ich nochmal kurz aus meine Rolle als Moderatorin heraushüpfen und in meine Rolle als ich mit dem Prozess involviert war, erm, das stimmt, und ich verstehe auch dein Punkt total Michael, na, dass du sagst, warum sind die jetzt in der Bewertung miteinbezogen und wir nicht, ich glaube, was hier bei der Bewertung auch wesentlich auch der Punkt war, ist von der einzelnen Fachexpertise eben weg zu gehen und das übergeordnete Bild zu sehen. Und deswegen war z.B. glaube ich VI also es war auch nicht meine Entscheidung, aber deswegen war u.a. VI in der Bewertung involviert, um halt diesen aussenstehende Blick der Stadtgesellschaft zu repräsentieren. Kann man sich jetzt darüber streiten, ob sie da die richtige Personen dafür sind, sehe ich auch so, erm, aber das war der Hintergrund davon. Und bei Babel war es z.B. soweit ich weiß auch nicht die Jana, die das bewertet hat, sondern auch jemand

andere, der mehr Ahnung von Plattform Architektur hat. Das zum Hintergrund dazu. Aber ich will den Prozess ja nicht stören. Ich will nur, das nochmal in Erinnerung rufen.

48:03

P8: Nee, es ist, wir haben ja grundsätzlich im ganzen Projekt und das werden wir auch weiter beibehalten na, immer so eine Diskrepanz zwischen TP und Plattformarchitektur. Also nicht, dass die gegen einander arbeiten würden, das nicht, na. Aber ich kann UC aus dem TP raus betrachten und ich kann aus der Architektur raus betrachten. Und das beist sich an der eine oder andere Stellen. Und das wird auch zukünftig so sein. Na. In Sinne von es beist sich wo liegt der Schwerpunkt in das Ganze usw. Und so wenn ich jetzt dann nochmal auf diesen Prozess darauf gucke, und sage, okay, meine UC die ich reingeschmissen hatten, die würden bewertet, eben v.a. aus was können wir lernen für die PA, und dann hat man gesagt, jo, super, Live Daten Verkehr, das passiert am meisten, machen wir das. Das kann ich nachvollziehen und gleichwohl war halt bei uns die Einschätzung, hey Live Daten Verkehr, da braucht man so viele Daten, lass uns mit was anfangen, was ohnehin Daten kriert. Ja, so rein aus diese fachlichen Sicht ist es halt irgendwie als allerste der Mount Everest bestiegen und danach kann man mal gucken, ob man die Zugspitze besteigen.

56:53

P2: Ich habe immer das Gefühl, und das war auch mit Sicherheit der Versuch bei diesen Bewertungsvorgang, man versucht dadurch so eine gewisse Objektivität...Neutralität verschiedener Dinge reinzubringen. Manchmal ist es aber halt so pseudo wissenschaftlich...das geht dann nicht wenn man noch nicht....dass man das wirklich in Zahlen runterbrechen kann. Das heißt, man muss doch davor deutlich mehr diskutieren, austauschen... die intern Expertise anhören, bevor man da anfangen kann, so einen pseudo wissenschaftliche Prozess daraus zu machen, weil sonst [unintelligible] da irgendwelche Bewertungen, Zahlen, eben basiert auf falschen Annahmen.

58:24

M1: Also wäre doch eigentlich auch auf einer abstrakteren Ebene daraus ein Learning, dass wir uns in jeden Zeit oder zu jedem Zeitpunkt, wenn wir eine Entscheidungen treffen, sehr bewusst sein müssen, was es für Auswirkung hat, und was ein Ziel diese Entscheidung ist. Das kam ja jetzt glaube ich auch schon öfters raus, dass das eben zu mehreren Zeitpunkte, nicht der Fall war.

Y.Y: Und ist es für euch, etwas was, sozusagen relativ übertragbar ist, in anderem Projekte, wo ihr drin seid, oder in der Stadtverwaltung, an sich, die Organisation. Oder ist es nur wegen dieses speziellen Kontext sage ich mal, von diesem Projekt anwendbar?

P2: Ich glaube schon, dass es übertragbar ist. Weil ich erinnere mich auch noch, ein Stück weit an der Diskussion damals, das kann man dann ja auch gut zeigen, "hier deswegen haben wir die Entscheidung getroffen". Das war schön objektiv, da gibt es, da hat die Punktzahl gekriegt. Und dann erscheint das so, na, pseudowissenschaftlich oder objektiv, aber das ist, ist es eigentlich gar nicht. Das sieht nur so aus, weil halt eine Zahl da steht. Aber im Nachhinein kann man natürlich schön sagen, hier, da und da haben wir das gemacht, wir haben einen schönen [unintelligible] Prozess, da kam das Ergebnis raus, deswegen haben wir es gemacht. Ist doch schön transparent nachvollziehbar. Aber deswegen muss es trotzdem nicht gut sein oder richtig sein. Und ich glaube, das passiert bei vielen Projekten. Dass das so oder so ähnlich gemacht wird.

59:58

P6: Die Basis muss stimmen, das heißt, eine Bewertungsmatrix muss eben eine Grundlage haben, und wenn ich die gescheit mache, die Bewertungsmatrix, und ich habe eine klare Zieldefinition vorher, dann passt es auch. Dann versuche ich die möglichst komplett zu machen, kann es auch gut gewichten, das kann eine sehr gute Methode sein. Aber eben nur wenn die Basis stimmt, das hat man ja gesehen.

M1: Mm hmm. Also wäre eigentlich auch mehr iteration an der Bewertungsmatrix notwendig gewesen.

P6: Auf jeden Fall. Also [unintelligible], die Reflexion notwendig gewesen. Stimmt die Bewertungskriterien mit dem Gesamtziel überein? Und wird das was wir erreichen wollen, dann eine Gewichtung abgebildet davon, das ist klar, da muss man dann sehr viel Wert darauf legen. Aber dann hätte die Methode aus meiner Sicht gut funktioniert. Ich fand das nicht schlecht, und so eine Objektivierung ist unter zu brechen auf einzelnen Punkte auch gut, aus verschiedenen Sichten auch nochmal zu bewerten. Halte ich...also das finde ich keine schlechte Methode, aber [unintelligible] sehr gute sogar

P2: Ja also das wollte ich auch nicht so unbedingt, falls es so rüber kam, ich finde an sich auch gut, nur es muss eine gewisse Bedingungen erfüllt sein, bevor man das dann machen kann. Erm, nur Gerede fände ich auch falsch, und dann nach der Diskussion zu sagen, hier wir machen halt die und die UC, danach so eine Prozess zu entwickeln und denn dann noch mal iterativ zu verändern, dann kann es funktionieren, finde ich auch so ja

P6: Das macht die Entscheidung auch transparent, also da kann man dann aus dieser Matrix kann man ja genau ablesen, aus welchen Gründen, jetzt ein UC dran gekommen ist und aus welchen Gründen nicht, wenn man sich vorher eben verständigt hat, wo will man hin, wie sieht die Wasch- wie soll die Waschmaschine aussehen, so etwa, am Schluß und dann dürfte es für jeden nochmal klar sein, warum das so ist. Das andere ist dann wieder das mit Diskuission, da gebe ich dir Recht Christof, das ist das was die LG macht. Cognac schwankend in der Hand die sagen, ach ja, das passt uns jetzt irgendwie, haben wir besser präsentiert bekommen oder so, das ist eben eine intransparent und nicht nachvollziehbar und das ist eigentlich so der [unintelligible] dann von diese Matrix.

1:09:23

P6: **Wenn ich in die Vergangenheit gehen könnte, dann würde ich als UC nur Sachen nehmen, die ich definieren kann, was gehört dazu und v.a. was gehört nicht dazu. Weil das was wir kriegen ist ein Festpreis angebot und keine Rahmenvertrag, wo man jetzt ewig Funktionalität ausschreiben, sondern für einen Prototyp, der muss begrenzt sein.** Da muss ein Zaun außerrum sein, da muss ich genau sagen, ich hätte gern 1, 2, 3, 4, 5, 6, und die Abnahme mache ich 1, 2, 3, 4, 5, 6 und das musste den Beteiligten klar sein, und nicht, dass sie sich vorstellen, ach da kommt jetzt irgendein System, da deckt jetzt unsere ganze Workflows ab, so war ja der WS mit Arup, na. Dass man, da waren wir [unintelligible] Fachinformatik da, da waren wir um Fachsystementwicklung waren wir drin, wo die gesagt haben, ja, da brauchen wir noch so intern noch eine Mail Funktion, so völlig egal für die Datenplattform.

P2: **Ja, sehe ich ähnlich. Also wenn ich auch Zeit zurückgehen, der war aus vielen Gründen glaube ich nicht geeignet aber auch der Grund, weil wir da jetzt dann neben Nutzer haben mit PGD und ALW die ganz eigene Vorstellung eigentlich eben ein Fachinformationssystem Vorstellung haben,** die dann sehr auch tatsächlich brauchen, also jetzt einfach mal ganz unabhängig von Smart City Projekt brauchen sie das halt und versuchen das jetzt darüber abzuwickeln. **Also ganz gefährlich und dadurch hat das natürlich und das ist definitiv passiert, von der Grundvorstellung von diesem UC, hat sich das sehr hinentwickelt, zu deren Vorstellung von einem Fachsystem. So na, das ist aber eigentlich nicht, das was wir wollten. Und das hätte man wahrscheinlich so nicht machen sollen, wenn man sich da genauer angeguckt hätte am Anfang - wer sind die Nutzer, was hat das für Implikation, und und und.**

1:13:20

P4: Das war ja auch so ein Quintessenz, dass man gesagt hat, was man daraus lernen will, wenn man Entscheidung trifft, muss man immer gleich Bedenken, was ist die Auswirkung, was hat es für Folgen und was ist eigentlich das Ziel dieser Entscheidung. Also nicht eine Entscheidung zu treffen um [unintelligible] Entscheidungswillen sondern um einen Schritt weiter zu kommen und dann auch einfach mal der Hintergrund zu sehen. Und das mit der Bewertungsmatrix, das war so ein Ergebnis, wo man gesagt hat, dass mal halt so mehr Schritte machen soll, immer mehr Schleife, um zu einem guten Ergebnis zu kommen.

Appendix C7: Aug 15 Reflection session - Selected passages from the transcript

15:44

P9: Ja, ich würde jetzt das dann einfach übernehmen. Genau. Was mir in der Vorbereitung echt nochmal aufgefallen ist und was ich eigentlich super finde, ist die Gelegenheit die wir jetzt haben zur Reflexion. Weil man macht so, man macht so ein zum nächsten und zum anderen, und diese Rückschau gibt es eigentlich so gut wie nie, oder man hat die Zeit nicht dazu. Ich möchte euch da jetzt einfach, wenn wir jetzt die Themen nochmal zusammen angucken, da euch nochmal ermuntern, wirklich zu sagen, Mensch welches diese Themen lohnt sich denn jetzt, wirklich nochmal zu reflektieren, wo haben wir dann meisten davon, wenn man jetzt das nochmal angucken in diesem Zyklus. In dem wir jetzt angucken, tiefer angucken, was bedeutet das für künftige andere Projekte. Deswegen Yourui könntest du nochmal teilen? Bei den Themen wie ich schon gesagt habe, die Abstimmung ist so bunt wie ihr alle. Das Rote war, wurde am häufigsten genannt und ist verteilt auf 4 Themen. Also ich gehe nochmal von vorne an..

18:08

P9: Da das jetzt nicht so ganz klar ist und auch ein Abstimmer, der da mitgemacht hat heute nicht da ist, möchte ich euch nochmal die Gelegenheit geben, wirklich diese 4 Möglichkeiten zur Reflexion nochmal anzugucken und zu sagen, okay, kurzes Votum abzugeben für was ihr denn jetzt wählt, und das wir da jetzt vllt.. Wir brauchen ja eigentlich kein Konsens, man darf jeder ein unterschiedliche Sicht der Dinge haben, aber hier braucht man eigentlich schon eine Übereinstimmung, das wir sagen, okay, wir nehmen uns jetzt dieses Paket und gehen jetzt nochmal in der Reflexion. Von daher wäre es mir ganz recht, ihr würdet da nochmal sagen, für was ihr da pladiert und dass wir da schnell zu einer Entscheidung kommen, weil mit Blick auf die Uhr haben wir nicht so arg viel Zeit. (Pause) Der erste der los legt, darf gleich sein Votum abgeben (Pause) Ich spreche jetzt einfach mal den Christof an, da geht es schneller.

22:04

P9: Aber ich frage mich, wenn ich das jetzt so richtig höre, ich muss ein bisschen, sorry dass ich unterbrechen, ein bisschen auf die Uhr gucken, sonst kriegen wir es nicht hin, ich frage mich, ob das, diese Fragen, die du dir stellst, ob die denn dann, wenn wir Zyklus anguckt, vllt. kannst du teilen, liebe Yourui, wenn wir uns diesen Zyklus angucken, das die sind in pinken Bereich für uns überlegen. Wenn wir sagen, wir nehmen jetzt diese prototypische Phase, wie alles gelaufen ist, ich warte mal kurz, bis es geteilt wird bzw. ihr könnt ja auch runterscrollen. Also da wenn ich dich richtig verstehe, Klemens, dann würde ich sagen, da kommen die ganzen Sachen rein, die wir jetzt lernen für das was kommt, und was bevorsteht. Und wenn wir uns diesen, dieses Thema nehmen, wie ist die prototypische Phase gelaufen, was wollen wir lernen aus dieser Zeit, dann würde ich vermuten, dass wir in pinken dann dieses Ergebnis haben, die du erwartest. Seht es die Anderen auch so, oder nicht? Oder bin ich, liege ich da jetzt falsch? Ich bin inhaltlich nicht so tief drin wie ihr, ich moderiere das nur, ihr musst mir sagen, wenn ich falsch lege, inhaltlich.

P2: Ich meine, Klemens meint ja wahrscheinlich ja, die tatsächliche Leistungsbeschreibung, die wir damals in der Ausschreibung bei der prototypphase, die wir erstellt haben.

P9: Ah, okay.

P4: Genau, also die Ausschreibung war offensichtlich halt nicht konkret genug und das ist dann halt bei der Umsetzung doch wieder viele Missverständnisse gegeben hat. Oder ja, das wir da wieder... (unterbrochen)

24:07

P9: Also ich kann euch das Thema nicht und ich will es euch auch nicht [unintelligible], sehe ich jetzt doch unterschiedliche Vorgehen, was ihr gerne habt, das ist die Frage, was die andere da noch separat anguckt

P5: Können wir nur eins machen?

P9: Ich glaube, jetzt haben wir nur noch eine halbe Stunde

24:30

P9: Und ihr müsst das zu dritt am besten entscheiden, das drängt uns am meisten, oder ... (unterbrochen)

P2: Zusammenarbeit wäre vllt. die Alternative, weil das ja auch relevant ist, auch bei der jetzt das gilt noch weiterhin in der prototypphase, da müssen wir weiterhin zusammenarbeiten, man könnte noch nachsteuern, und wir müssen natürlich auch in der, nach der großen Ausschreibung wieder mit einem Dienstleister zusammen implementieren und zusammenarbeiten. Und da kann man natürlich auch reflektieren. War das gut, wie wir es aufgesetzt haben, mit diesem Projektkopf, Projektbauch, die Meeting Strukturen, usw. Da kann man mit Sicherheit auch darüber diskutieren. Ich

weiß es nicht. Es ist alles sinnvoll, eigentlich ist es...ja.

P5: Dann musst du mal eine Entscheidung treffen, Christof.

P9: Ich würde auch sagen, weil inhaltlich kann ich es nicht. Du bist der Projektleiter, wo hast du es gefühlt bzw. der Stellvertreter. Wo hast du das Gefühl, wo kriegen wir am besten ein Output, ein wichtigste, der Beste Output raus? 25:28

P2: Tja tja tja, dann bin ich für Zusammenarbeit oder..Zielbild..

P9: Nein, nichts oder, halt, nein...

P2: Dann machen wir halt Zusammenarbeit.

P9: Können die Andere damit leben? (Gunnar und Klemens nicken) Super. dann gehen wir doch ins Board. Sind alle soweit drin, oder? Mit dem Zyklus haben alle letztes Mal gearbeitet, d.h. das muss ich nicht erklären, um was es geht. Wir fangen an den gelben Stellen an. Das konkrete Erlebnis, das ihr hatten. Was ist passiert, die Zusammenarbeit. Ja Jakob, du bist super schnelle, danke schön. Wie war die Zusammenarbeit in der prototypischen Phase. Was hat gut funktioniert, was hat vllt. nicht so gut funktioniert. Ihr könnt hier links die ganze Fragen sehen. Welche Diskussionen sind im Vorfeld geführt worden, auch gerade bei dem Modell, was Christof beschrieben hat, die die Zusammenarbeit strukturiert war, wer hat welche Rolle gehabt. Was war gut, was war nicht gut, welche Entscheidungen wurden getroffen, vllt. ohne die Anderen, vllt. mit den Anderen, ähm, gerne einfach da mal loslegen. Zu sagen, was euch einfällt, und Jakob versucht so schnell er kann, mitzuschreiben.

32:00

P9: Und in der Entscheidungsfindung, wart ihr beteiligt, und wenn ja wie?

P5: Ja, wir waren beteiligt, Gott, wo eigentlich? Ich überlege gerade. Bei Plattform wurde ja nicht viel entschieden. Da hab ich relativ viel...(unterbrochen)

P9: Nee, wie die Zusammenarbeit zu laufen hat. Ist es für euch vorgegeben gewesen, wart ihr im Vorfeld damit beteiligt mit der Struktur?

P5: Nie. [unintelligible] beteiligt mit der Struktur waren oder was habe ich nicht verstanden.

P9: Ja, ob ihr da mitreden könntet?

P5: Innerhalb der Strukturen?

P9: Mm hmm

P5: Ja klar, es gab ja diese ganzen Runden mit den extremen Kopfrunde, Bauchrunde, und wie es alle hießen da, und wenn, es kam ja oft Fragen von den DL auf, und wenn da was entschieden musste, wurde es entschieden klar, aber teilweise wurde es auch vorgesetzt, weil man [unintelligible] eine gewisse Richtung haben wollte, aber ich kann das eher nur aus der Plattform Geschichte reden, weil bei den Use Cases würden die Entscheidungen quasi schon getroffen aus den anderen Gremien und wir würden quasi nur unser Feedback gegeben [unintelligible] Das war okay, da wo es nicht okay war können wir sagen halt, aber im Grunde war es mehr so eine Berichterstattung. Und die gingen in der Regel okay aus, aber es fehlte ein bisschen die Transparenz, das wissen was die eigene Kollegen, die interne Kollegen, die in den jeweiligen Runde dann besprochen hatten, weil dabei waren immer nur dann die extern, die DL. So hat man nur so deren Sichtweise bekommen und nicht die von Hr. Bauder zum Beispiel zum Thema LiveDaten UC.

56:44

P4: Wir nutzen halt Confluence auch für das Aufgabemanagement, was eigentlich in Jira stattfinden soll, was eigentlich dieses Modul von Jira nicht geläufig ist, und uns vllt. tendiert den Mehrwert auch nicht klar ist, das muss man vllt. uns das nochmal vor Auge führen, **vllt. nochmal eine Schulung oder das ist das geht ein bisschen verloren ja, die Funktionalität und Vorteile von Jira ist halt einfach nicht geläufig, denke ich.**

P9: **D.h. wenn wir die Zusammenarbeit wirklich verbessern will für die nächste Zeit, muss man sich überlegen, ob man da noch nochmal bei der Auswahl der Tools nochmal tiefer einsteigt, dass man vllt. eine Abgrenzung vornimmt oder die Leute besser, wie du sagst, Klemens, schult oder die die es brauchen auch wissen wie es benutzen sollen. Vllt. muss man sich dieses Thema nochmal annehmen.** Ihr seid, also ich finde, so wie du es formuliert hattest am Anfang, Christof, ist der Informationsfluß vllt. oft nicht so gut läuft, vllt. braucht man auch ein paar Leute die das evtl. auch anders sehen, [unintelligible] alles festgehalten und das ist jetzt schon die Frage, was nehme ich, was ändere ich jetzt wirklich effektiv ja. [unintelligible] Wir haben da Einiges angestoßen, haben uns ein paar Gedanken gemacht, wollen wir jetzt wirklich da auch was ändern, in der Art und Weise da Zusammenarbeit mit welchen Tools oder nicht. Ich glaube, da muss Christof, Ivan...

P2: Ja tatsächlich ich hätte gedacht, dass ein bisschen mehr Negatives tatsächlich auch kommt, das war jetzt ja eher tatsächlich viel Positives was doch alles ganz gut gelaufen ist jetzt, ich bin ja auch zufrieden, **das war ja auch ein**

kleiner Punkt, das Einzige ist tatsächlich Jira, da würde ich tatsächlich mir jetzt tatsächlich vornehmen, für diese Montagsrunde die wir momentan für Plattformarchitektur haben, wenn ich das da sinnvoll benutzen möchte, Jira dann würde ich da, müsste ich da nochmal ran gehen und das irgendwie übersichtlicher aufbereiten. Nur für das Thema Ausschreibung Plattformarchitektur und dann vllt. noch mit Filtern, dass man es übersichtlich hinkriegt, das Kanban Board. Vllt. bringt es noch was, oder man müsste sich insgesamt überlegen, wie wir damit umgehen. Weil es geht ein bisschen auseinander. Ivan will das eigentlich schon stark forcieren, mehr mit Jira zu arbeiten, aber das müssten wir vllt. nochmal diskutieren, wie wir das angehen. Ja, ich weiß es nicht.

1:01:56

P5: Also ich glaube, für Lerneffekt braucht natürlich schon mehr, also ich hab für mich ein paar Dinge mitgenommen, die Wichtigkeit von Jira [unintelligible] bewusst sein, dass grundsätzlich alles ganz gut läuft kam auch unbewusst sein, das ist ja auch ein Lerneffekt, dass man manche Sachen beibehalten kann, aber wenn man was beibehalten können will, muss man es dauerhaft immer wieder celebrieren. Und wenn wird es [unintelligible] was ich von Jira gehört habe für den nächsten Wochen, nee so will ich nicht sagen, aber ich glaube man muss da dann nochmal das dauer fokussieren. Da reicht ja eine Runde nicht aus, klar. Und es gab ja auch Änderungen die identifiziert worden. Entschlagen der Punkte, z.B. mal mit Ivan reden

P2: Ja, sehe ich auch so. Also wir waren jetzt halt leider echt ein sehr kleine Runde na, das war natürlich ein bisschen schwierig, aber ich z.B. war mir nicht sicher, wie zufrieden halt alle sind mit der aktuellen Zusammenarbeitstruktur, Meetingstrukturen, teilweise habe ich so gehört oah, das ist ein bisschen viel mit Terminen usw. aber ich glaube, ja wie gesagt, kleine Runde heute, aber das insgesamt doch recht zufrieden ist, ist ja schon mal gut, war mir nicht ganz bewusst, und generell ist es, dass man viel häufiger machen muss, dieses Reflektieren. Wir haben es bei den Anderen gesehen, bei dem UC Auswahl Thema, und wie kriege ich jetzt diese Lerneffekte tatsächlich angewandt, na, man, alle kriegen das nebenbei so ein bisschen mit, was gut oder was nicht so gut läuft, haben vllt. Ideen, wie das verbessert werden könnte, aber macht man es tatsächlich, und wie macht man es tatsächlich, ich glaube da setzt man viel zu wenig Zeit darauf, das müssen wir mehr machen, versuchen wir jetzt bei dem UC Auswahl Thema, aber kann man auch hier bei dem Thema machen, auch bei Jira muss man das z.B. viel häufiger machen denke ich, damit das ja, damit wir das irgendwann sinnvoll einsetzen.

1:01:21

P9: Was ich noch als Ergänzung sagen möchte, ich finde es ja auch schon sehr spannend, hat man schon daraus gelernt? Hat es ein Lernprozess bei euch bewegt, dass ihr euch darüber Gedanken gemacht habt, hat es euch was verändert? Oder muss man um wirklich zu lernen, worüber ja die Yourui auch forscht, nochmal tiefer rein? Hat diese Anstoß heute schon gereicht, sieht mit dem Thema Zusammenarbeit zu befassen, und man hat gelernt, wie man es künftig besser machen will, oder ist für den Lerneffekt, war das noch zu wenig? Das würde mich auch kurz bei eurem Feedback interessieren. Jeder ein Satz.

1:04:06

P4: Für mich war es jetzt auch eine wichtige Lerneffekt, dass man diese Reflexion immer wieder von Neuen anstoßen muss und nicht selbstverständlich ist, sonst schleift sich da was ein und wird vllt. in der falschen Richtung, aber das man immer wieder diese Frage stellt oder in Frage stellt, ja, und da hat sich jetzt wieder gezeigt, wo jetzt was gut läuft, und wo man noch Verbesserungsmöglichkeiten hat, man muss einfach darüber reden.

Appendix C8: August 29 workshop - Selected survey responses

Wie war der Reflexionsprozess für dich? Was hat dir an den Methoden gut gef...

Gute Methode mit 4 Ebenen. Probleme werden gesammelt und analysiert und Schlussfolgerungen für die Zukunft gezogen.

Methodik mit den 4 Quadranten fand ich sehr gut. Vorformulierte Fragen auch sehr hilfreich. Etwas schwierig alles GEsagte wirklich korrekt aufzunehmen/einzuordnen

Es ist immer gut Prozesse zu reflektieren. Besonders schön war, dass wir "gezwungen" waren den ganzen Prozess zu beleuchten von Beginn bis Ende. Das digitale Whiteboard als Methode hat mir beim zweiten Treffen gut gefallen, beim ersten hat es die Diskussionen etwas behindert. Hier wäre ein reales Treffen ideal gewesen - was natürlich den Umständen geschuldet nicht machbar war.

schärft das Bewusstsein zur Reflexion, was gut gelaufen und was besser gemacht werden kann

Mit welchen Erlebnissen / Erinnerungen verbindest du diese Sessions?

Offene, ehrliche Beiträge der Beteiligten

Wir brauchen mehr Zeit dafür und sollten wirklich gezielte Reflexionen zu verschiedenen Themen machen um möglichst viel daraus zu lernen.

Besonders der Termin am 1.8. bleibt mir in Erinnerung, weil dort klar wurde welchen Turn wir schon hinter uns haben und wie sich das Projekt intern bereits verbessert hatte. Es war ein schönes Erlebnis hier positiv in die Zukunft sehen zu können.

dass es sich lohnt, die Zeit zu investieren, die bisherige Praxis, Ablauf zu reflektieren und zu hinterfragen, um daraus Verbesserungen für die Zukunft zu erreichen.

Figure 15: Selected Survey Responses for the August 29 Workshop

Appendix C9: Aug 29 Reflection session - Selected passages from the transcript

12:04

P2: Könnte ich mich anschließen. Oder möchte jemand anderes zuerst? Also ich bin auch total zufrieden insgesamt. Versuche ich ein bisschen zu ergänzen und nicht genau zu wiederholen. Weil wir haben ja gesagt, wir wollen u.a. diese Prototypische Phase so aufziehen, **um nicht Fehler in der große Ausschreibung erst zu machen, sondern am besten davor schon möglichst viel ein bisschen schon abfrühstücken, sage ich mal, an Fehlern aber auch an Erfahrung die wir einfach brauchen, um überhaupt diese große Ausschreibung angehen zu können.** Ich glaube da haben wir Einiges gemacht, also ich glaube wir haben auf ziemlich vielen Ebenen was dazu gelernt in dieser prototypischen Phase. Und zwar ein mal so, wie wir uns organisatorisch bei so eine komplexen Projekt entwickeln müssen und aufstellen müssen, also da haben wir ja wahnsinnig viel gelernt, nicht nur was Tools oder so was angeht, sondern auch einfach wie man sich in welche Zusammensetzung wann treffen muss und so solche Dinge haben wir gelernt, aber wir haben auch ziemlich viel inhaltlich gelernt, also erm natürlich teilweise spezielle Themen in beiden UC, aber auch die ganze übergreifende Themen die wir später brauchen, sei es über unsere bestehende Systemlandschaft oder so, einfach was dazu zu lernen, und viele, viele Punkte, also wir haben auf unterschiedliche Ebene und unterschiedliche Bereiche gelernt und das war eigentlich der Ansatz, deswegen bin ich zufrieden. Natürlich ist auch haben sich Probleme rauskristalisiert, oder Sachen die nicht so einfach waren, aber auch das wollten wir ja eigentlich, insofern, ich bin auch zufrieden.

16:20

Klemens: Also ich wiederhole mich vllt nur, aber ich finde insgesamt das Verfahren als einzig sinnvolle Alternative, diese prototypische Verfahren für dieses komplexe Thema, das fand ich gut und das sollten wir, nehmen wir auch wieder für diese große Ausschreibung na, diese 2-stufiges Verfahren mit im 1. Stufe wo wir dann diese geeignete Anbieter raussuchen und an die geeigneten dann letztendlich dann auffordern, ein Angebot abzugeben. Ob wir jetzt, wie viel wir jetzt dann was wir daraus lernen, das müssen wir noch besprechen also ob man wirklich nur auf das 5 begrenzen oder mehr, ist noch eine Frage der Ressourcen usw. na, man weiß ja nicht, wie viele sich bewerben werden und so weit ist es immer ein bisschen Für mich schwierig. Aber insgesamt das ist Verfahren schon so wie wir es machen finde ich es gut und wenn man daraus dann die notwendige Schlüssel ziehen können, um so besser, müssen wir halt besprechen.

20:17

Y.Y.: Erm vllt. eine Nachfrage. Wie, das ist für Ivan und Michael Bauder, ihr habt das beide ernannt, das ist fachlich oder inhaltlich schwer zu sagen, oder schwer zu beurteilen, ob ihr sozusagen genug gelernt habt, durch diese prototypische Phase. Wie würdet ihr das dann beurteilen, was würdet ihr, was bräuchtet ihr um zu sagen, okay, jetzt sehe ich, dass wir das doch gelernt haben oder nicht. Durch die prototypische Phase oder Ansatz.

P8: So wie an der Uni, na, eine Leistungsüberprüfung, letztenenders, damit lerne ich, was gelernt wurde, also, nein, kein Test, na, aber die Ausschreibung zu schreiben. Das ist Schritt 1. Und dann die Ausschreibung durchzuführen. Das ist Schritt 2. Und während dem beiden Schritten wird man merken, ob man genügend gelernt hat, oder nicht. **Also, dass wir was gelernt haben, ist kein, steht völlig außer Frage, ja natürlich, wir haben enorm. Aber die Frage ist immer noch, hab ich genug gelernt, und das kriege ich halt, indem Punkt immer ist [unintelligible] quasi wiedergespiegelt indem ich dieses Wissen wiedergeben muss na oder in aufbereitete Form oder angewandte Form oder sonst was.** Also klassisch wie an der Uni, ich lerne für mich für die Klasur und weiß nicht, ob ich genug gelernt habe, keine Ahnung, das sehe ich erst, wenn die Prüfung vor mir liegt.

27:23

P2: Ja, ich habe noch eine Sache vielleicht, es ist mir nämlich wieder eingefallen, wo ich aber nicht 100% sicher bin, wie ich es bewerten werde, aber was mir aufgefallen ist, ist und das war ein Stück weit extra, wir haben die natürlich ganz schön überladen mal, die Prototypphase sage ich mal, aber ich glaube es war extra und vllt. war sogar gut so, aber da kann man sich mit Sicherheit darüber streiten, na, weil wir haben, und dadurch sind auch ein bisschen Konflikte aufgetreten, z.B. so die Diskussion, geht es mehr jetzt an die UC oder geht es eigentlich um das Thema Plattformarchitektur, da haben auch z.B. unsere Anbieter falsch verstanden, gleichzeitig, das ganze organisatorische und agile Methode, und tools usw. also mindestens diese 3 wenn nicht schon sogar 4 Sachen sind, die wir allen in diesem Prototypischephase eingeladen haben, die natürlich auch zur Konflikte geführt haben, ich würde aber sagen, vllt. war das auch gut so, weil dann haben wir eben diese Konflikte gesehen, erlebt und zwar in diese prototypische Phase, wo es noch nicht so schlimm ist, wenn man da nicht es nicht perfekt klären kann. Also diese Diskussion, geht es mehr um die UC oder um die PA, das ist sozusagen teilweise ein bisschen unbeantwortet bzw. vllt. kriegen wir jetzt an der eine oder

andere Stelle nicht das perfekte Ergebnis von den DL, weil die am Anfang die Priorität nicht richtig gesetzt haben, oder es wurde ein bisschen hin und her geschoben und so, na, aber aus meiner Sicht macht das glaube ich nicht, oder ich finde es okay, dass wir die so ein bisschen überladen haben, die prototypphase, aber man kann sich wahrscheinlich darüber streiten. Aber ja, das ist aufgefallen sage ich mal, dass wir es sehr vollgeladen haben. Führt aber vllt. auch dazu, dass man auch in all diesen Bereichen was dazu lernt und dann war es vllt. auch gut so.

38:39

P1: Die Frage ist auch was ist die Alternative. Na, also wenn wir uns die Frage stellen, war das jetzt überladen oder sonst was, muss immer die Frage mitbeantwortet werden was ist die Alternative dazu. Also es gibt zwei Extreme, prototypphase überhaupt nicht machen, bis prototypphase umfassend machen und dazwischen verschiedene Abstufungen. Wie hätten die ausgesehen? Dann hätten wir eine Beratungsfirma geholt, die uns über Architektur berät, wir hätten aber nichts über die UC gewusst. Oder wir hätten uns ein Consulting Unternehmen geholt, dass die UC aufdrosselt, werden aber nichts über die Architektur gewusst. Oder wir hätten irgendwie doch versuchen, doch beides anzugehen, hätten aber vllt. nichts über die Struktur gelernt, weil wir das theoretisch betrachten hätten, wir hätten die Umsetzung weggelassen, dann hätten wir die Geschichte mit PGD nicht drin gehabt. Und Schwierigkeiten, die uns unterwegs aufgefallen sind. Also es ist immer, klar, das Gefühl ist da, okay wir haben zu viel, auf der anderen Seite, was wäre die Alternative gewesen, und wie zufrieden wären wir mit dieser Alternative gewesen. 39:58 Das ist ein bisschen hypothetisch, klar, aber in dem Moment, wo wir sagen, wir haben zu viele Themen angegangen, muss man den Alternativvorschlag präsentieren, und ich glaube nicht, dass der uns zufriedengestellt hätte.

44:15

Y.Y.: Also mir ist bewusst, dass natürlich jeder individuell anders damit umgeht. Und ich frage mich auch ob ihr das aus der Projektebene auch, ob da auch ein Prozess gibt, auf der Projektebene. Natürlich können mehrere Personen die Wahrnehmung haben, okay, jetzt haben wir ein Fehler gemacht, oder unsere Vorstellung aus dem Projektteam entspricht nicht die Realität, wie ist es im Projekt so, wie geht man damit um, aus Projektteam, oder wenn es tatsächlich noch nicht so ein feste Prozess gibt, wie ihr das auch euch vorstellt, was wäre sozusagen ideal, z.B. irgendwas ist passiert im Projektteam, hier waren unsere Annahmen oder Vorstellungen vllt. nicht richtig, wie kann man dann daraus lernen?

45:25

P1: Also, das Thema was ich bisher sehr wenig gemacht habe, ist das Thema Review bzw. diese Rückblick auf Prozess im Vergangenheit. Und wir haben auch besprochen und uns commiten, dass wir das machen wollen und verstärkt, und das ist auf jeden Fall als Möglichkeiten, um diese Lernerfahrungen festzuhalten. Weil sonst bleibt das bei mir oder bei einzelnen Personen, und nicht in der sozusagen Organisation, und da dafür ist das nämlich auch hilfreich, und dafür brauchen wir das, und das haben wir auch erkannt letztendlich, in diesem Prozess, ja, war uns eigentlich irgendwie schon bewusst, aber etabliert haben wir es noch nicht, und so was habe ich auch selten irgendwo in unsere Organisation bisherige [unintelligible] Jahren auch gesehen. Also das ist wirklich festgehalten wird und explizit ein Rückblick geworfen wird, um zu schauen, was haben wir hier gelernt, oder was haben wir oder was haben wir falsch gemacht, oder was positiv zu formulieren, was wollen wir in Zukunft anders machen. Und das so festzuhalten, und dann stellt sich auch die Frage, wenn irgendwas festgehalten ist, dann ist das findet das nur im Raum also unter den Beteiligten, die das festgestellt haben, und viel mehr oder wichtige Fragestellung ist, wie kriegen wir das Person-unabhängig, in der Organisation zu vermitteln. Das Gelernte, also das was ich gelernt habe, also eben um diesen Kopf Monopole nicht noch mehr zu stärken sondern das abzubauen. Also das ist so eine Herausforderung, die ich jetzt im Projekt auch merke, wie angewiesen wir sind, an die Organisation der Stadtverwaltung insgesamt und wenig wir Einflussmöglichkeiten auf die gesamte Organisation haben. Und genau, nichtdestotrotz ist es wichtig, das aufzubauen und das versuchen da weiter zu tragen, in aller möglichen Bereichen und dann irgendwann werden wir schon an dem Punkten kommen, wo wir ein paar Commitment, also die bestimmten Commitment verfassen werden, und das als Regeln aufstellen müssen, wie das z.B. wenn wir über die Daten sprechen, wie die Daten genutzt werden oder gepflegt werden oder genau. Aber ich habe auch oft erlebt, dass man auch diese Commitments zum Regeln und Entscheidungen auch irgendwo festhält, und das ist nochmal ändern [unintelligible] oder eine andere Herausforderung, wie das gelebt wird. Also erstens kenne ich das, Information sind wirklich viele, und Überforderung in dem Inhalt ist erstmal da, das alles zu kennen, und dann in 2. Stufe mich daran zu halten. Und oft habe ich da erlebt, es ist irgendwie auch einfacher, die Sachen nicht zu kennen und dann so zu machen, wie man es denkt, genau, aber das ist auch nicht das Wichtige, und dann in Maß zu finden, wie transferieren wir das in die also zu den weiteren Beteiligten, dass das bleibt als Herausforderungen, und die wir nicht allein aus dem Projekt lösen können, sondern eben von wegen, Wiederverwendbarkeit oder Anwendbarkeit von dem Gelernten, was wir haben, also da müssen wir die [unintelligible] oder Koalition mit Organisationseinheiten Stadtverwaltung gehen und in die breiteren Fuß zu fassen mit dem Gelernten, was wir hier als Blaupause hier im Projekt machen. Und das ist auch ein Ziel aus dem Projektantrag, so also das haben wir auch formuliert, **wir wollen mit dem Projekt sozusagen Wissenstransfer in die Verwaltung auch machen**. Aber eben wir haben nicht festgelegt, wie viel davon. Ist es jetzt irgendwie also wir haben das nicht in irgendein Zahl übersetzt, nur ein Absicht und genau. **Ich**

meine, das passiert so oder so, aber eben, die Frage ist, wie kann das strukturiert passieren, und dauerhaft oder nachhaltig, genau, da habe ich noch keine Antwort aber es ist auch eine, ich meine, genau, ein Thema, in dem wir arbeiten.

1:02:51 – transitioned to the reflection/evaluation about the group reflection sessions

Y.Y.: So als Erstes wollte ich fragen dann, was bedeutet Reflexion für euch? Also wozu dient das, wofür ist es am wichtigsten, wie viel ist zu viel Reflexion? Also bzgl auf projekt-basiertes Lernen, nicht allgemein.

1:05:45

P2: Ja ich glaube der Unterschied ist, **also das ist zumindest bei uns so in der Runde, ich denke, wir können gar nicht anders, wir haben immer irgendwie reflektiert**, aber halt oft irgendwie unstrukturiert und im eigenen Kopf oder halt nur für sich selber und jetzt macht man da ein bisschen ein Prozess daraus oder überlegt, was ist dann den sinnvollen Umgang, wie kann man auch wirklich in der Gruppe vllt. so ein Reflexionsprozess sinnvoll gestalten, und das macht man mit Sicherheit viel zu wenig in der Verwaltung so oder hat man eigentlich gar nicht gemacht, insofern zu viel erreichen wir da wahrscheinlich nicht so schnell, aber trotzdem muss man überlegen, wie man es geschickt machen sollte, und du hast ja auch die richtige Fragen hingeschrieben, wer soll dann da dabei sein, wie viel ist da Diskussion, wie viel muss man da anleiten von diesem Reflexionsprozess, da finde ich tatsächlich auch nicht so einfach, aber ich fände es wahnsinnig wichtig, dass wirklich, ja ein Stück weit vorbereitet und strukturiert anzugehen, dass man das halt wirklich im Projekt zu dem verschiedenen Themen macht und sich dann überlegt, okay, jetzt reflektieren wir mal DSDM Modell, wer muss da dabei sein, und dem stellen wir mal mit ein bisschen Zeitaufwand ruhig, das lohnt sich genau für andere Themen halt. Klar, ich bin jedenfalls, ich glaube da sind wir einig, jeder hat da seine Reflexion schon im Kopf gemacht, macht man auch so immer, aber nicht in diesem nicht in solchem Formate und nicht in der Gruppe, und ich glaube es wäre aber durchaus sinnvoll, das zusammenzutragen weil es geht sicherlich auseinander, die jeweilige Vorstellung oder die jeweilige Learnings, die die unterschiedliche Leute sich dann gemacht haben zu welchem Thema denn auch immer.

1:09:32

Y.Y.: Was hält ihr dann eigentlich davon, jetzt dass ihr das schon ein bisschen ausprobiert habt, von diesem Prozess, ist es überhaupt so notwendig, so kritisch über andere Annahme, also von seinem eigenen aber auch von den anderen Projektmitglieder darüber zu reflektiere und zu diskutieren? Um dadurch was daraus zu lernen, oder ist es nicht unbedingt notwendig, weil ihr habt trotzdem was gelernt und ihr habt trotzdem durch diese Sessions auch was gelernt, obwohl wir nicht ständig über unsere Annahmen also kritisch hinterfragt haben.

1:10:10

P8: Ich würde sagen, es ist wie immer im Leben, na, also die Richtige mit dem richtigen Maß, macht das Ganze Sinn. Erm, aber man kann da auch den Wissenschaftler Tod sterben, na, also wenn ich jetzt, die Wissenschaft selber hat ja auch diesen Prozess, na, also früher, die Wissenschaft unter Positivismus, und da was ich beobachte ist wahr, und nur was ich beobachten kann, kann ich überhaupt beurteilen, usw. und so fort, bis hin zu Konstruktivismus dann und radikale Konstruktivismus usw. und so fort und das ist ja dann ins Abstruse, dass die sicher, irgendwie bestimmte Wissenschaftsrichtungen dann die Frage stellen, darf ich als Europäer über Asiaten forschen, z.B. na, also und dann am Ende was für Annahmen und man kann ich kann auch in dem Projekt ins Millionste gehen und welche Annahmen über Plattform habe ich, welche Annahme über Daten habe ich, bis hin zu wie bin ich sozialisiert, und mein Hintergrund als weißer mitteleuropäer kann ich dann überhaupt das verantworten, eine Datenplattform die Energie, also, usw. na, du weißt was ich sagen will, genau so ist es, wenn ich halt diese Reflexionsprozess anschau, der ist jetzt sehr strukturiert, ja, und darauf kann ich immer ins Detail ins Millionsten und irgendwann kommt immer so ein Punkt, wo ich die Benefits, die ich daraus ziehen kann erm nicht mehr den Aufwand gerechtfertigen, vllt. sich sogar umdrehen und dass wir eigentliche negative Dingen rauskriegen kann. Bzw. gibt es halt auch so ein bisschen von der Mathematik gesprochen, dann immer diese Punkte, wo ich in Axiom lande, wenn ich die entdecke, weiß ich nicht, ob es sich zum Glück einen städtischen Beschäftigen beiträgt, also wenn ich mich irgendwann frage, die Sinn und Berechtigung städtische Verwaltungshandeln, und sonst was, dann muss ich eigentlich kündigen, so na, weiß ich nicht, ob das dann der Sinn ist, unser Annahmen nachdenken, wenn wir dann alle hinterher kündigen müssen, so ja, vllt. ein bisschen überspitzt jetzt formuliert.

P2: Ja, sehe ich ähnlich, also man kann das mit Sicherheit übertreiben, also wie mit allem halt na, aber in Stück weit finde ich stimmt es trotzdem, dass was du gesagt hast, und wir hatten es auch z.B. im Projekt so ein bisschen, bei dem, im Prinzip beim Thema, Zielbild PA, da hat so ein bisschen mitgespiegelt, so eine Annahme, also vllt. interpretiere ich auch so ein bisschen was rein, na, also von wegen wir hätten nur früher darüber reden müssen, es haben da irgendwie unterschiedliche Zielbildern existiert, und das hat man jetzt irgendwie laufen lassen, und wir haben uns da nicht früher genug zusammengesetzt, und hmm hmm hmm, aber im Endeffekt, glaube ich, wenn man jetzt darüber reflektieren würde, war das vllt. gar nicht so, wir waren da einfach nur noch nicht so weit, es haben da gar nicht so die wahnsinnig unterschiedliche Zielbilder existiert, die irgendwie in Konflikt geraten haben, sondern, die haben einfach gar nicht

wirklich existiert, die müssen erst mal geschärft werden und das ist aber im Prozess passiert und war dadurch viel sinnvoller. Also da waren irgendwelchen Annahmen da, die durchaus nicht gestimmt haben vllt., und das hat auch zu einem kleinen Konflikt vllt. geführt, jetzt kann man das reflektieren und sagen, hmm hmm, so und so war das, und kann man das auch lösen, aber im Endeffekt hat sich es jetzt aber genau im Doing glaube ich gelöst und wir haben jetzt eine halbwegs einheitliches Bild uns geeinigt und aufgelöst was war jetzt besser, weiß ich nicht genau, aber da sieht man so, da ist auf jeden Fall so ein kleine Konflikt entstanden, die man vllt. auch hätte lösen können, aber man hat es jetzt aber auch so geregelt, im Griff gekriegt. Mmm ja, und was jetzt besser ist, weiß ich auch nicht.

P1: Ja vllt. stimmt nicht direkt dazu aber ergänzend. Also es gibt zwei Punkte, die nach meiner Wahrnehmung so eine Rolle spielt. Also das ein mal, das persönliche, das persönliche Kontakt zu, darüber gibt es Commitment in jedem Projekt oder Zusammenarbeit absolut wichtig ist, aber strukturiert und gezielt wird damit nicht oft, oder häufig geht es runter oder wird, oder wird dem einzelnen über, also es gibt keine strukturierte Heransgehensweise, wie wir jetzt unser persönliche Kontakt aufbauen, das dann hilfreich ist, dass die falschen Annahmen gar nicht entstehen können. Da meine ich in dem man sich häufig mit Beteiligten austauscht über die Arbeitsthemen aber auch über sonstigen Themen, um diese persönliche Ebene aufzubauen, die wichtig ist, um zu verhindern, dass die falschen Annahmen entstehen können und dass die Vertrauen sich eher entwickelt. Also okay, dass der Christof oder Michael oder egal wer, wenn ich weiß, okay, die kümmern sich, die werden das bestmöglichst machen und ich habe keine Angst, oder ich muss keine Angst haben, dass für mich irgendein Nachteil entstehen wird, und das haben wir auch im Projekt sehr stark gestört, auch das Thema, persönliche, einzelne Person können überhaupt gar nicht miteinander vernünftig reden und das wirkt sich auf jeden Fall auf die falschen Annahmen und dann gibt es auch dieses Thema die Sicherheit, also durch die, also Wertschätzung der eigenen Arbeit, dass in Vergangenheit stattgefunden hat, und die Sicherheit, ob das jetzt so alles besteht, oder wie sieht es diesen neuen Modell aus, und wo stehe ich dann in diesen neuen Modell, auf welchem Punkt und da entstehen auch Ängste, die dann auch für die falschen oder Annahmen dann entsorgen, sozusagen. Also es gibt ja diese psychologische Ebene will ich sagen und ein mehr Einflussfaktoren die gar nicht so inhaltlich, also ich glaube auch, wenn wir inhaltlich reden, dann werden wir uns sehr schnell kommitten, aber bis man über Inhalt sprechen muss, müssen ein paar Bedingungen oder Rahmen gelten und das ist dieses Thema Beziehung. Und Beziehung im Zusammenarbeit Kontext meine ich, und Thema Ängste abbauen,, also wir machen jetzt z.B., das war auch so ein Learning, aus diese ganze Prototypphase oder wir müssen mehr Teambuilding rüber gehen und mehr auch mit uns beschäftigen, ohne Inhalt, um wenn Inhalt zum Thema ist, dass wir das relativ schnell das abhandeln können. Und dazu dient z.B. auch so ein Teamtag, was jetzt im September stattfinden wird. Und die weitere die dann folgen, also über diesen Aspekte wollte ich nochmal, ich glaube, es ist auch sehr wichtig, um eben um diese falschen Vorstellungen oder Annahmen oder Ängste da ja zu bewältigen.

An example of the workshop outcome is provided here. The full documentation is not provided due to the size of the file.

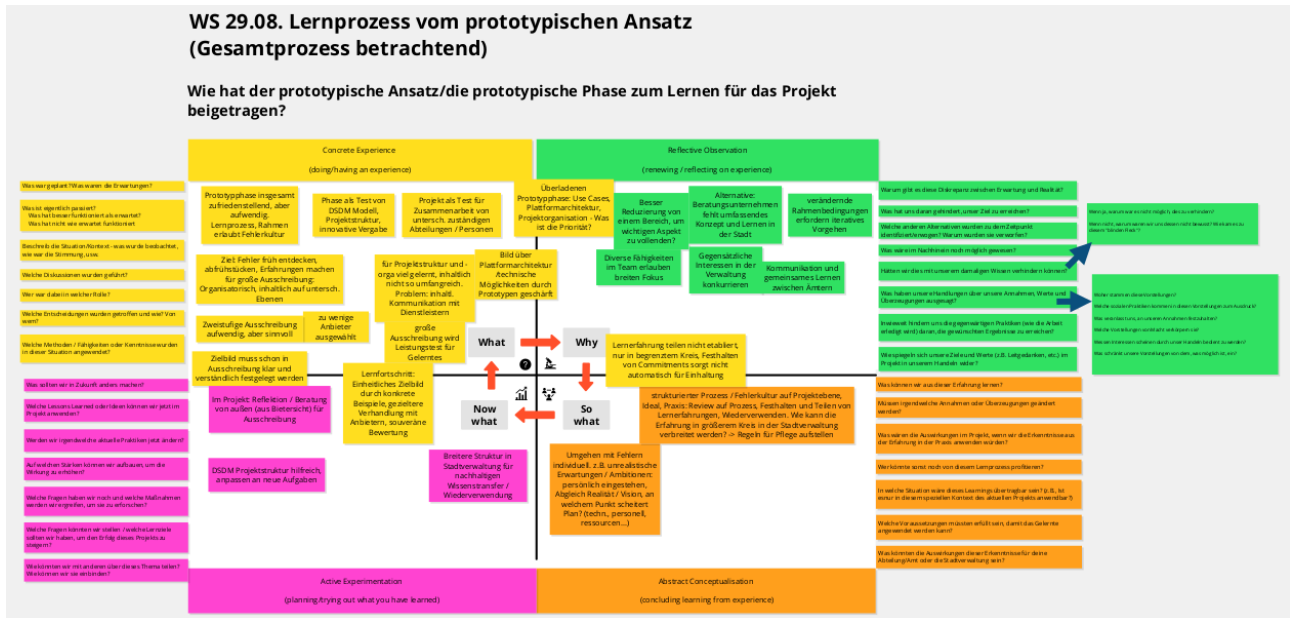


Figure 16: Selected Documentation in Conceptboard from the August 29 Workshop

Appendix D: Complementary Information for Data Analysis

Here, I provide additional information for the data and analysis presented in the Findings and Discussion section. For example, the original quotes in German and the sources of the quotes.

Appendix D1: Learning goals and expectations

Table 31: Original quotes in German and Data Source for Learning Goals and Expectations

Goal	Original example quote in German	Data collection method / source
Better understanding of complex reality	“Hilfreich um Komplexe Themen mit den wir uns beschäftigen besser zu verstehen.”	May 23 workshop survey response to the question: “Was verstehst du unter "Lernen" im Rahmen des Projektes? Wie würdest du es definieren oder charakterisieren? Kannst du bitte einige Beispiele nennen?”, p. 138.
Improved collaboration with others	“Zieht auf eine bessere Zusammenarbeit im Projekt ab.”	May 23 workshop survey response to the question: “Was verstehst du unter "Lernen" im Rahmen des Projektes? Wie würdest du es definieren oder charakterisieren? Kannst du bitte einige Beispiele nennen?”, p. 138.
Skill acquisition	“Sich die Skills anzueignen, die man nicht beherrscht z.b. Projektmanagement jira, neue Vergabeformen, aber auch Methodenkompetenz (Public Service Design).”	May 23 workshop survey response to the question: “Was verstehst du unter "Lernen" im Rahmen des Projektes? Wie würdest du es definieren oder charakterisieren? Kannst du bitte einige Beispiele nennen?”, p. 138.
Problem-solving	“Projektbasiertes Lernen: - Lernen anhand Problemstellungen im Projekt --> Wie löse ich ein Problem? - Informationen sammeln und evaluieren (Austausch mit Kollegen/innen, Bücher, Fortbildung) - Lösung ausprobieren, falls die Lösung nicht funktioniert andere Optionen ausprobieren.”	May 23 workshop survey response to the question: “Wie sollte deiner Meinung nach ein guter Lernprozess aussehen? Was sind die Merkmale eines effektiven projektbasierten Lernens?”, p. 138.
To deal with new things	“Wir bearbeiten in diesem Projekt Themen, die nicht bekannt oder teilweise bekannt sind. Wir nutzen die Methodiken, die wir noch nie oder nicht angewandt haben. Wir verwenden die Vorgehensmodell, jetzt gerade Richtung Vergabe, die auch nicht gemacht worden bisher, wir nutzen die Systeme, die bisher auch nicht angewandt worden. Und das alles setzt voraus, dass sich diese ganzen Systemen, Methoden, Vorgehensweise, kennenlernen und lernen muss.”	P1, Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 135, timestamp 00:47.
To avoid future mistakes	“Um nicht Fehler in der große Ausschreibung erst zu machen, sondern am besten davor schon möglichst viel ein bisschen schon abfrühstücken, sage ich mal, an Fehlern aber auch an Erfahrung die wir einfach brauchen, um überhaupt diese große Ausschreibung angehen zu können.”	P2, Appendix C9: Aug 29 Reflection session - Selected passages from the transcript, p. 150, timestamp 12:04

Appendix D2: Learning mechanisms

Table 32: Original quotes in German and Data Source for Learning Mechanisms

Mechanism	Example quotes	Source
Learning by acquiring knowledge or skill from others (internal or external)	“Und ansonsten funktioniert auch oft bilateral – also in Einzelgesprächen, wo es kurz erklärt wird, wie was funktioniert oder zum Beispiel Vorteile von irgendetwas ist.”	P1, Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 135, timestamp 07:19.
	“An einem Konferenz teilnehmen.”	P1, Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 135, timestamp 13:20.
Learning through formal education programme	“Aber es kommt natürlich auch von Außen. Also wir haben uns da immer wieder Unterstützung geholt oder sind selber auf Fortbildung und dann bringen wir es halt sozusagen indirekt wieder rein.”	P2, Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 135, timestamp 16:18.
Learning by creating shared meaning	“Ziemlich an dem Anfang vom Projekt, wo wir überhaupt erst mal die Use Cases versucht haben [...] zu finden [...] das war schon ein bisschen schwer zu erklären, warum man diesen Aufwand sozusagen macht, ‘man weiß doch eigentlich was man machen möchte’, aber im Endeffekt haben sich dann doch alle darauf eingelassen [...] das war glaube ich auch gut so, und das haben wir größtenteils würde ich sagen im Workshops gemacht, wir haben natürlich auch auf Confluence unsere Definition so ein bisschen hinterlegt, das jeder die Begrifflichkeiten dann immer wieder auch mal nachgucken kann.”	P2, Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 135, timestamp 07:19.
Learning from prototyping	“Prototyp --> Lernen wie eine Plattform aufgebaut werden kann, wo Fehler gemacht werden können, was muss alles berücksichtigt werden.”	May 23 workshop survey response to the question: “Was verstehst du unter ‘Lernen’ im Rahmen des Projektes? Wie würdest du es definieren oder charakterisieren? Kannst du bitte einige Beispiele nennen?”, p. 138.
Learning from repeating / applying something	“Derjenige, diejenige muss es selber ausprobieren, anwenden, bis es wirklich, ja erlernt ist sage ich mal.”	P2, Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 135, timestamp 28:37.
Learning through documentation	“Wissen Dokumentieren (auch Fehler)”	May 23 workshop survey response to the question: “Wie sollte deiner Meinung nach ein guter Lernprozess aussehen? Was sind die Merkmale eines effektiven projektbasierten Lernens?”, p. 138.
Learning through “processing in the background”	“Du hörst was, und dann Gehirn bearbeitet das irgendwie, und erst im Nachhinein kriegt man sozusagen diese Lampe geht es an und lernen hat stattgefunden.”	P1, Appendix C1: Learning context preparatory interview - Selected passages from the transcript, p. 135, timestamp 29:54.

Appendix D3: Important Factors for Project-based Learning

Table 33: Original quotes in German and Data Source for Important Factors for Project-based Learning

Level	Factors	Original quote in German	Source
Individual	Individual motivation to learn	“Bereitschaft/Offenheit zu lernen ist nicht immer gegeben.”	May 23 workshop survey response to the question: “Welche Hindernisse oder Herausforderungen gäbe es beim Lernen aus dem Projekt? Kannst du einige Beispiele nennen?”, p. 138.
	Understanding of the necessity of learning	“Auch Akzeptanz dass "man nicht alles weiss".“	May 23 workshop survey response to the question: “Welche Hindernisse oder Herausforderungen gäbe es beim Lernen aus dem Projekt? Kannst du einige Beispiele nennen?”, p. 138.
	Incentive to share information	“Was habe ich davon, gelerntes weiterzugeben?”	May 23 workshop documentation in Conceptboard, p. 139.
	Availability to learn	“Zeit fürs Lernen.”	May 23 workshop survey response to the question: “Welche Hindernisse oder Herausforderungen gäbe es beim Lernen aus dem Projekt? Kannst du einige Beispiele nennen?”, p. 138.
Team / Project	Structure and process for learning in the project	“es gibt keine Systematik bzw. gezieltes Lernen.”	May 23 workshop survey response to the question: “Welche Hindernisse oder Herausforderungen gäbe es beim Lernen aus dem Projekt? Kannst du einige Beispiele nennen?”, p. 138.
	Match of learning capacity and learning requirement	“Überforderung mit zu viel neuen Tools + Methodik.”	May 23 workshop survey response to the question: “Welche Hindernisse oder Herausforderungen gäbe es beim Lernen aus dem Projekt? Kannst du einige Beispiele nennen?”, p. 138.
Organization	Culture of learning from mistakes	“Fehlerkultur... leider nicht stark ausgeprägt in der Stadtverwaltung“	May 23 workshop survey response to the question: “Welche Hindernisse oder Herausforderungen gäbe es beim Lernen aus dem Projekt? Kannst du einige Beispiele nennen?”, p. 138.
	Institutional structure	“Hierarchische Strukturen in der Verwaltung stellen Hürden dar, schnell und unkompliziert Dinge auf den Weg zu bringen.”	May 23 workshop survey response to the question: “Welche Hindernisse oder Herausforderungen gäbe es beim Lernen aus dem Projekt? Kannst du einige Beispiele nennen?”, p. 138.
	Competing priorities	“Zu wenig zeitliche Ressourcen durch Alltagsgeschäft.“	May 23 workshop survey response to the question: “Welche Hindernisse oder Herausforderungen gäbe es beim Lernen aus dem Projekt? Kannst du einige Beispiele nennen?”, p. 138.
	Information availability	“Informationsmangel“	May 23 workshop documentation in Conceptboard, p. 139.

Appendix D4: Important Factors for Learning Through Prototyping

Table 34: Original quotes in German for Important Factors for Learning Through Prototyping

Factor	Example quote
Ability to accept failure	“Akzeptanz der Allgemeinheit im Falle des Scheiterns -> Umsetzung der Prototypen sollte daher realistischen Anforderungen standhalten und nicht komplett losgelöst von der Realität erfolgen.”
Alignment between the political level and the specialist level	“Führungskräfte sind sehr an schnellen Lösungen interessiert. Da besteht die Gefahr, dass notwendige Iterationen nicht gemacht werden. Es wird zu wenig getestet bzw. das drängendste Problem nicht gelöst, weil die Nutzer unzureichend einbezogen werden.”
Ability to change or be independent of existing institutional structure	“Beharren auf Zuständigkeiten und Entscheidungsbefugnisse durch Führungspersonal, Amtsleitungen. Starre Regeln, Bürokratie, Abläufe in der Verwaltung.” “Externe Abhängigkeiten minimieren.”
Time to implement methodologies (properly)	“In der Theorie kennen wir sämtliche methodische Ansätze die es braucht. Ideale Voraussetzung wäre es genügend Zeit zu haben, die einzelnen Schritte auch wirklich zu gehen.”
Reflection and evaluation of experiences	“das aktuelle Prototyp-Verfahren analysieren: Inwieweit wurden die formulierten (Zwischen-)Ziele erreicht? Welche nicht / nur teilweise? Warum nicht? Was war gut, was hat gefehlt? Welche Änderungen muss ich vornehmen, damit ich den nächsten Prozess erfolgreicher gestalten kann?”
Documenting lessons learned	“Begleitende fortlaufende Dokumentation der positiven und negative Eindrücke während des gesamten Verfahrens, damit die Learnings und Erfahrungen nicht verloren gehen.”
Team composition	“Hohe fachl. Heterogenität.”
Time frame for prototyping	“Zeitfenster verlängern für die Umsetzung.”
Prioritize the project / prototyping process	“Während der Prototypphase nur die Arbeiten die dafür notwendig sind durchführen und keine weitere Projekte.”
Clarity on time requirement for members	“Das DIGIT muss aus meiner Sicht verdeutlichen, wie viel Personalkapazität (Zeitaufwand etc.) sind von den Projektbeteiligten erwartet. Die bisherige agile Arbeitsweise konfliktiert mit den Vorgängen innerhalb der Stadtverwaltung.”

Note: All of these quotes are taken from the survey responses for the June 27 workshop.

Appendix D5: Examples of Joint Meaning-Making

Here are some example quotes illustrating the types of joint meaning-making outcomes of the group reflection sessions.

1) Sharing individual interpretation of events, e.g.:

- Sharing emotions, opinions, recollection, motivation behind past behaviours and practices
- Sharing individual interpretation of the causes of problems

Example quotes:

Aber dann wurden die bewertet, und dann war so ein Punkt, der echt frustrierend war, weil die Beurteilung dann irgendein [unintelligible] wo Punkte geteilt wurde, wo die TP keinen Einfluß mehr hatten, wo ich mich immer sehr gewundert habe, dass dann über Mobilität, über die Wichtigkeit bestimmter Dinge beurteilt wurde von Personen, die mit den TP nichts zu tun hatten, und die auch mit dem Thema Mobilität nicht so befasst waren eigentlich (P8, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 22:02).

Was hier bei der Bewertung auch wesentlich auch der Punkt war, ist von der einzelnen Fachexpertise eben weg zu gehen und das übergeordnete Bild zu sehen. [...] Kann man sich jetzt darüber streiten, ob sie da die richtige Personen dafür sind, sehe ich auch so, erm, aber das war der Hintergrund davon. [...] Das zum Hintergrund dazu. Aber ich will den Prozess ja nicht stören. Ich will nur, das nochmal in Erinnerung rufen (M1, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 44:54).

2) Questioning past/current processes, e.g.

- Questioning how decisions should be made (who has the right, for what purpose, how, etc.)

Example quote:

Das ist ja interessant die Frage wie die überhaupt auf Babel kamen. Ich weiß da gibt es ja Beziehungen in DIGIT, [unintelligible] ausführen zu wollen. Aber so was soll man in der Nähe Zukunft auch überlegen, wie man eine Beratungsfirma einbindet, warum, usw (P5, Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 31:54).

3) Constructing shared meaning of experiences, e.g.

- Construct the knowledge gained from doing, e.g., in terms of the unknown unknowns that are now apparent in hindsight (conflict between expectations and reality triggered by doing)
- Creating the shared narrative of the benefit of the prototypical approach (agile, innovative, etc.)

Example quotes:

P6: Wenn ich in die Vergangenheit gehen könnte, dann würde ich als UC nur Sachen nehmen, die ich definieren kann, was gehört dazu und v.a. was gehört nicht dazu. Weil das was wir kriegen ist ein Festpreis angebot und keine Rahmenvertrag, wo man jetzt ewig Funktionalität ausschreiben, sondern für einen Prototyp, der muss begrenzt sein [...]

P2: Ja, sehe ich ähnlich. Also wenn ich auch Zeit zurückgehen, der war aus vielen Gründen glaube ich nicht geeignet aber auch der Grund, weil wir da jetzt dann neben Nutzer haben mit PGD und ALW die ganz eigene Vorstellung eigentlich eben ein Fachinformationssystem Vorstellung haben, [...] Also ganz gefährlich und dadurch hat das natürlich und das ist definitiv passiert, von der Grundvorstellung von diesem UC, hat sich das sehr hinentwickelt, zu deren Vorstellung von einem Fachsystem. So na, das ist aber eigentlich nicht, das was wir wollten. Und das hätte man wahrscheinlich so nicht machen sollen, wenn man sich da genauer angeguckt hätte am Anfang - wer sind die Nutzer, was hat das für Implikation, und und und.

(Appendix C6: Aug 1 Reflection session - Selected passages from the transcript, p. 142, timestamp 1:09:23)

Also ich wiederhole mich vielleicht nur, aber ich finde insgesamt das Verfahren als einzig sinnvolle Alternative, diese prototypische Verfahren für dieses komplexe Thema, das fand ich gut und das sollten wir, nehmen wir auch wieder für diese große Ausschreibung na, diese 2-stufiges Verfahren mit im 1. Stufe wo wir dann diese geeignete Anbieter raussuchen und an die geeigneten dann letztendlich dann auffordern, ein Angebot abzugeben (P4, Appendix C9: Aug 29 Reflection session - Selected passages from the transcript, p. 142, timestamp 16:20)

3) Experiencing the benefit of the social reflective practice, e.g.

- Positive experience, leading to increased motivation to engage in more in the future
- Added to experiential basis with knowledge and skill of one methodological approach

Example quotes:

Für mich war es jetzt auch eine wichtige Lerneffekt, dass man diese Reflexion immer wieder von Neuen anstoßen muss und nicht selbstverständlich ist, sonst schleift sich da was ein und wird vllt. in der falschen Richtung, aber das man immer wieder diese Frage stellt oder in Frage stellt, ja, und da hat sich jetzt wieder gezeigt, wo jetzt was gut läuft, und wo man noch Verbesserungsmöglichkeiten hat, man muss einfach darüber reden (P4, Appendix C7: Aug 15 Reflection session - Selected passages from the transcript, p. 146, timestamp 1:04:06).

dass es sich lohnt, die Zeit zu investieren, die bisherige Praxis, Ablauf zu reflektieren und zu hinterfragen, um daraus Verbesserungen für die Zukunft zu erreichen (Appendix C8: August 29 workshop - Selected survey responses , p. 149)

4) Creating joint commitment for future action, e.g.

- Decision or expression of joint intention to change project approach or engage certain problems differently

Example quotes:

P4: [...] vllt. nochmal eine Schulung oder das ist das geht ein bisschen verloren ja, die Funktionalität und Vorteile von Jira ist halt einfach nicht geläufig, denke ich [...]

P9: [...] D.h. wenn wir die Zusammenarbeit wirklich verbessern will für die nächste Zeit, muss man sich überlegen, ob man da noch nochmal bei der Auswahl der Tools nochmal tiefer einsteigt, dass man vllt. eine Abgrenzung vornimmt oder die Leute besser, wie du sagst, Klemens, schult oder die die es brauchen auch wissen wie es benutzen sollen. Vllt. muss man sich dieses Thema nochmal annehmen. [...]

P2: [...] das war ja auch ein kleiner Punkt, das Einzige ist tatsächlich Jira, da würde ich tatsächlich mir jetzt tatsächlich vornehmen, für diese Montagsrunde die wir momentan für Plattformarchitektur haben, wenn ich das da sinnvoll benutzen möchte, Jira dann würde ich da, müsste ich da nochmal ran gehen und das irgendwie übersichtlicher aufbereiten.

(Appendix C7: Aug 15 Reflection session - Selected passages from the transcript, p. 146, timestamp 56:44).

Appendix E: What would I tell other students considering this research strategy for their thesis?

Here, I elaborate on what I learned from the research journey that might be helpful for others considering a similar approach.

Confirm your motivations - Brace yourself for the (painful) process

I was warned that action-oriented research is demanding, and it was, but not in the way that I imagined. I imagined it would be difficult to work with the practitioners in their contexts, given the constraints from “real-life”. That was true, for example, my thesis data collection timeline fell unfortunately mostly on the German *Sommerloch*, summer vacation schedule where employees take turns going on vacations (in my case, it seemed from June to September), so the participation for my session fluctuated. I also anticipated and experienced the struggle with theory, which was mentioned by several authors (see, e.g., Zuber-Skerritt & Fletcher, 2007). In addition, with an evolving focus, it was hard for me to articulate what was my research purpose of the goals of my interventions (“what do I want to get out of this session?”), which makes it hard for me to work with the participants. Having to balance the different expectations (my own, the participants’, the faculty’s/supervisors’) was also challenging. These were the anticipated challenges. However, what I did not anticipate was that it would challenge many of my underlying assumptions about knowledge, research, and myself. For example, I experienced the (on-going) transition from a positivistic to interpretivistic notion of science and research (thanks to a tip from my first supervisor). In my attempt to figure out what exactly I am supposed to deliver for the “research” part of action research, I ended up reflecting on the social, cultural and historical context of my beliefs. These were deep waters I was not prepared to swim in. But, it appears true learning is ineffable. I received blank stares or incredulous laughter when mentioning my epistemological disconnect or reflections. I probably did overthink this. Regardless I am grateful I took the risk and used this opportunity to stick to what I wanted to do. Namely, I did not want to engage in a research that was far from practice. Although the impact practice was miniscule as anticipated, and my contribution to knowledge is probably even more trivial, I was surprised at how much I learned through the process. In a nutshell, brace yourself for the rough ride ahead. Ensure that you have strong motivations to take on this challenge and that your research situation is indeed appropriate for action research.

Know what you are getting yourself into – what type of action research are you going to do?

On that note, it helps to know that there are many different types of action research in many different fields and to reflect on which type of action research you will be considering. Personally, I struggled (and continue to struggle) with the difference between “consulting”, “action research”, “applied research” and what it means to attempt to solve a practical problem vs. a research problem. What does it mean to be theory-based or contribute to knowledge? I still have not yet figured it out. But at the least, I can recommend the following resources to start: Adu, 2016; Bradbury, 2015; Craig, 2009; Dick, 1993; Fisher & Phelps, 2006; Schneider, 2012; van der Meulen, 2011; J. Wittmayer et al., 2021; Zuber-Skerritt & Fletcher, 2007; Zuber-Skerritt & Perry, 2002. Note that not all of these authors are describing the same thing when they refer to action research, which is why it might be helpful to review them to understand the differences. Interpretive Research Design by Schwartz-Shea and Yanow (2013) might also be helpful. My mistake was that I started with only one idea of action research and it was not the one appropriate for my case and I was not able to course-correct to incorporate a more suitable methodology, thus lacking rigour in my research design and analysis.

Document the thought process

Since action-oriented research approaches are process-based research compared to “traditional” or “conventional” research, a constant and clear articulation of the problems and goal would have helped make the process clearer to me. If there is the possibility in the faculty, the idea of presenting it as a journey and not a sanitized product/outcome might be productive, although this is not a must for action-oriented research and it is in fact probably controversial even within this field (see, e.g., Zuber-Skerritt and Fletcher, 2007, vs. Fisher and Phelps, 2006). Although I documented a lot more of the process than I otherwise would have, thanks to some tips I received early in process, I erroneously focused that more during the data collection process (noting the importance of reflection on positionality), instead of also on the evolution of my thought process within the research itself. Given the emergent and iterative nature of the research, I realized in hindsight that a documentation of the thought process with regards to literature would have been helpful as well. This also requires being a reflective practitioner within the research setting. For example, when participants ask

questions about the research, I believe it is more important to reflect on the question than to answer it. Ask: Why does the person ask this question? For example, why did both my moderators ask me why I am “repeating” the same group reflection session multiple times instead of trying new methods out each time? What do these questions say about their assumptions or understanding of what I am doing? What are my own assumptions about what I am doing? Unfortunately, in this particular case, I could not delve into these questions.

Embrace the discomfort and enjoy the journey

At least, I have been told that this is a helpful attitude to take. If you can manage it, I salute you and admire you. I can only speak from my experience that the alternative is very, very painful. The bright side is that it made me question the underlying assumptions of how I assess my self-worth and allowed me to re-evaluate my ability to cope with uncertainty. I renewed my struggle with perfectionism: If I “know” this thesis is not that important, why is it so hard for me work pragmatically and not obsessively on it? Why is it important to me at all to fulfill some sort of nebulous standard of research when I should know now that there are different standards, and that it does not matter in the end anyway (for me, practically speaking). I realized my claims of being a “recovering” perfectionist was way off the mark when I had my “relapse” in this process. It seems some things may take a lifetime to learn. Or some people are just really bad at learning from their experiences. If you decide to go down this path, I wish you all the best. Either you have a smooth journey or you encounter your own personal demons like I did. Either way, I hope that it is a rewarding experience for you or those on the journey with you.

Testimony

I herewith declare that I have written this paper on my own and that I have not used any other sources and materials than those indicated. I properly cited the materials I have relied upon. I have not submitted this document as a master thesis elsewhere

Signature:

Name:

Date:

Place: