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LEVERAGING ARCHITECTURE AND EDUCATION: APPROACHING THE FACILITATION OF GOOD LEARNING ENVIRONMENTS IN AUTHENTIC AND EMERGING CONTEXTS

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**Thesis abstract**

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**Title**
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**Abstract**
Change is rapid, drastic, unavoidable, and complex in education today. Learning environments at once have to respond to these changes and support the process of change (Kumpulainen & Mikkola, 2014; Kuuskorpi & González, 2011). In order to facilitate these new learning environments, educators need support and training to recognize and engage with the multitude of emerging contexts in education (Burns, 2000; Chalas, 2015; Larson, 2004). This master’s thesis intends to address these issues through a pragmatic approach to the learning environment, supported by the bridging of educational and architectural theory and resources. Six Perspectives for Approaching the Holistic Learning Environment are used to explore current themes and trends in learning environment research and practice in the American/Northern European context. Synthesized themes of a good learning environment in the larger context will be brought forward, as well as a wide range of pertinent learning theories, methods, and practical examples. In collaboration with learning landscape specialist Markku Lang, those themes and trends are then contextually engaged to develop a case study teacher training in the facilitation of good learning environments in the Finnish context. The case study was implemented in the Fall of 2016 with a group of Finnish teacher training students at the University of Oulu. The findings and conclusions are developed through a holistic content analysis of the knowledge co-created during the training. An analytical rubric tool is introduced as the method for incorporating the learning environment theory developed in the initial sections of the thesis into the facilitation and evaluation of good learning environments. The analysis centers on a thick description of four learning environment facilitation plans created by the participants in the teacher training. In the final conclusions section, the effectiveness of the teacher training will be discussed, as well as the further development of learning environment theory. The conclusions are meant to offer flexible knowledge and lay a deep context from which to draw on to implement personal methods in contextual learning environments, not final knowledge that lays out rules of conduct. The value of the thesis, then, is in what the process and conclusions offer to the discussion of learning environments, as well as to quality facilitation of learning environments in practice.

**Keywords**
architecture, authenticity, education, emerging contexts, holistic design, interactive constructivism, learning environment, pragmatism
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CONTENTS

1. INTRODUCTION: THE LEARNING ENVIRONMENT AS DIALOGUE .................................................................................................................. 1
   1.1 Finding the Gap .................................................................................................................................................................................. 2
   1.2 Research Questions .............................................................................................................................................................................. 3
   1.3 Research Goals ................................................................................................................................................................................... 4

2. THEORETICAL FOUNDATION AND INITIAL LITERATURE REVIEW .................................................................................................... 6
   2.1 Purpose through Roles ........................................................................................................................................................................... 7
   2.2 Reconciling Principles, Fields, and Disciplines ............................................................................................................................... 10
   2.3 Researcher: Dewey’s Pragmatism Recontextualized .......................................................................................................................... 12
   2.4 Teacher: Interactive Constructivism ............................................................................................................................................... 15
   2.5 Architect: Holistic Design Theory .................................................................................................................................................. 19
   2.5 Reconciliation: Structure, Methods, Goals ................................................................................................................................... 21

3. RESEARCH DESIGN .................................................................................................................................................................................. 22
   3.1 Case Study as a Vehicle for Exploration and Knowledge Co-Creation ............................................................................................. 22
   3.2 Parts of a Training-Centered Case Study ....................................................................................................................................... 23
   3.3 Development and Implementation of the Training Plan .................................................................................................................. 26

4. THICK LITERATURE REVIEW .................................................................................................................................................................. 30
   4.1 “Concrete and Emerging Context” of the Learning Environment .................................................................................................... 30
   4.2 Six Perspectives for Approaching the Facilitation of the Holistic Learning Environment ................................................................ 33
   4.3 Findings from the Literature Review: Characteristics of a Good Learning Environment ................................................................... 57

5. CASE STUDY PROCESS AND RESULTS .............................................................................................................................................. 63
   5.1 Process and Selected Results ............................................................................................................................................................... 63
   5.2 Development and Implementation of the Training Plan ................................................................................................................ 63

6. ANALYSIS: FOUR LEARNING ENVIRONMENT PLANS ...................................................................................................................... 69
   6.1 In-Training Application ............................................................................................................................................................................. 69
   6.2 Prompt Number One ............................................................................................................................................................................. 76
   6.3 Prompt Number Two ............................................................................................................................................................................ 81
   6.4 Prompt Number Three .......................................................................................................................................................................... 86
7. CONCLUSIONS: REFLECTIONS ON THE CASE STUDY PROCESS
...........................................................................................................................................93

REFERENCES ..................................................................................................................................101
  List of Figures.................................................................................................................................110
  List of Tables .................................................................................................................................116

APPENDICES .....................................................................................................................................118
  Appendix 1 - Pre-Case Materials....................................................................................................118
  Appendix 2 - Development of the Training Materials.................................................................124
  Appendix 3 - Visual Data from the Case Study..............................................................................135
1. INTRODUCTION: THE LEARNING ENVIRONMENT AS DIALOGUE

Change is rapid, drastic, unavoidable, and complex in education today. Learning environments at once have to respond to these changes and support the process of change (Kumpulainen & Mikkola, 2014; Kuuskorpi & González, 2011). In order to facilitate these new learning environments, educators need support and training to recognize and engage with the multitude of emerging contexts in education (Burns, 2000; Chalas, 2015; Larson, 2004). This master’s thesis intends to address these issues through a pragmatic approach to the learning environment, supported by the bridging of educational and architectural theory and resources. Six Perspectives for Approaching the Holistic Learning Environment are used to explore current themes and trends in learning environment research and practice in the American/Northern European context. Synthesized themes of a good learning environment in the larger context will be brought forward, as well as a wide range of pertinent learning theories, methods, and practical examples. In collaboration with learning landscape specialist Markku Lang, those themes and trends are then contextually engaged to develop a case study teacher training in the facilitation of good learning environments in the Finnish context. The case study was implemented in the Fall of 2016 with a group of Finnish teacher training students at the University of Oulu. The findings and conclusions are developed through a holistic content analysis of the knowledge co-created during the training. An analytical rubric tool is introduced as the method for incorporating the learning environment theory developed in the initial sections of the thesis into the facilitation and evaluation of good learning environments. The analysis centers on a thick description of four learning environment facilitation plans created by the participants in the teacher training. In the final conclusions section, the effectiveness of the teacher training will be discussed, as well as the further development of learning environment theory. The conclusions are meant to offer flexible knowledge and lay a deep context from which to draw on to implement personal methods in contextual learning environments, not final knowledge that lays out rules of conduct. The value of the thesis, then, is in what the process and conclusions offer to the discussion of learning environments, as well as to quality facilitation of learning environments in practice. The thesis hopes to meaningfully engage educators and designers in the dialogue of a good learning environment.
The “learning environment” as a phrase originated with information and communications technology (ICT) studies, but has evolved as a crucial part of constructivist and design terminology in regards to the holistic aspects of the spaces in which learning happens, as well as discussions of their formation in support of good learning processes and results (Mononen-Aaltonen, 1998, p.174; Taylor & Enggass, 2009). Not only are the emerging contexts and expectations of learning environments various and complicated, but the form, function, and ideal of a learning environment are, as well. From a museum, to a public park, to a traditional classroom, a “learning environment” includes all the spaces able to be utilized in pursuit of learning. This is why Mononen-Aaltonen (1998) problematizes the concept of a concrete definition of the learning environment. Her main assertion is that the learning environment is a “dialogue”, one which grows and evolves and changes across time and context and a variety of speakers and discussions (p.183-191). “The dialogic learning environment forms an organic, living whole: take off one element, and it changes into something else” (Mononen-Aaltonen, 1998, p.190). This lack of a “final truth” of the concept reflects John Dewey’s thoughts on education, which will be central to the theoretical foundation of the thesis (Hickman, 2008; Reich, 2008). Therefore, this preliminary definition is not to be understood as terminal, but rather a foundation for critical thought: “A learning environment is a dialogue of the fields of vision, charged with the potential for development” (Mononen-Aaltonen, 1998, p.198). My theoretical basis supports and is supported by this working definition which opens the floor for a deep, meaningful exploration of the nature of the learning environment, in all of its aspects and potentialities. This foundational step will then lead to a discussion of the practical application of these ideals. In short, the thesis hopes to meaningfully engage educators and designers in the dialogue of a good learning environment.

1.1 Finding the Gap

Kumpulainen and Mikkola (2014) and Kuuskorpi and González (2014) as well as the rest of the authors in the Finnish National Board of Education’s Perspectives from Finland – Towards new learning environments, agree that there are rapidly emerging and complexly challenging new contexts to which current and future learning environments must adapt. These emerging contexts include the proliferation of new technologies, the rise of new crosscutting standards of equality, and the postindustrial transformation of the labor market, to name just a few. Chalas
(2015) and Larson (2004) further complicate this issue by stating there is a gap in teacher training in how to facilitate these environments. Even further, Gislason (2010) laments the gap in architectural research into the impact of different types of learning environments and Taylor and Enggass, in their 2009 book *Linking Architecture and Education: Sustainable Design for Learning Environments*, place great emphasis on the ultimately detrimental lack of interdisciplinary interactions from the architectural design to the educational implementation of learning environments. These overlapping gaps in research and practice form the three primary gaps that this thesis seeks to begin to rectify:

1) The gap between the architectural and educational research and practice in regards to the learning environment.

2) The gap in accessible and holistic materials on the impact of the learning environment on the educational process.

3) The gap in teacher training to facilitate the learning environment in challenging emerging contexts.

The intention of this thesis, therefore, is to step into the gaps in theory and practice surrounding learning environments. Leveraging the disciplines of architecture and education through the research process, the thesis will explore how to approach the facilitation of good learning environments in authentic and emerging contexts.

### 1.2 Research Questions

To approach the gaps previously discussed, the primary research questions are as follows:

- What is a good learning environment according to current literature?
- How can the disciplines of architecture and education be combined/bridged through research to support the facilitation of good learning environments?
- How can the findings from the first two questions be incorporated into a teacher training in order to increase teacher agency in the learning environment?

Each research question encompasses elements of all three gaps. An explicit and deep theoretical discussion will lay the foundation for the bridging of architecture and education throughout the
thesis process. The literature to be reviewed will also be intentionally interdisciplinary and the presentation of the thesis will focus on accessibility and clear synthesis of the holistic materials reviewed. The case study teacher training is an example implementation of the materials to be created, as well as an example of the process of designing an interdisciplinary teacher training in a specific context. Agency for teachers through the training process is explored in the findings, analysis, and conclusions from the case study process. The explicit combination of my skills and knowledge as both a teacher and an architect will come into each step of the thesis process, offering another perspective on finding agency through interdisciplinary experience. Overall, the research questions are the impetus for the path and methods of the thesis. The research goals discussed in the next section will be the guides to the specific process along that path and the specific implementation of those methods.

1.3 Research Goals

The guiding goals of the research are as follows:

- Expanding and clarifying the conversation around learning environments

The primary methods of reaching this goal are implemented through interdisciplinary research, practical application of that research, explication of the practical application process, and through the clear dissemination of the research findings.

- Filling the gaps in existing research and practices in regards to learning environments and learning environment facilitation training for teachers

The primary methods of reaching this goal are implemented through the wide and deep literature review, the accessible presentation of the overall findings, and through the application of the initial findings to the case study teacher training process.

- Supporting agency for teachers in facilitating learning environments

The primary methods of reaching this goal are implemented through my narrative as an architect, teacher, and researcher, through providing six holistic perspectives from which to approach the learning environment, and through authentic hands-on application of the initial
materials and findings of the thesis. Overall, this thesis intends to provide an accessible and holistic foundation for engaging with the ideals and practices learning environment.
2. THEORETICAL FOUNDATION AND INITIAL LITERATURE REVIEW

This thesis is built on several interdependent set of theories from the three main fields in my background: architecture, education, and research. The interdependence and application of these theories evolved over the length of and according to the needs of the research process. A recontextualized pragmatism and Dewey’s transactional realism are the core theoretical scaffolding for reconciliation with and of interactive constructivist educational theory and holistic and contextual design theory (Biesta, 2003; Biesta, 2010; Hickman, 2008; Reich, 2007; Reich, 2008; Taylor & Enggass, 2009; see Figure 9 on page 10). Gislason (2010) and Biesta (2003) offered the mindset and tools that encouraged and supported this mixed theoretical approach. The process of this reconciliation had a great impact on the way the thesis was conducted and is presented, as well as shaping the goals of the case study. Pursuing a deep understanding of theory, both as a construct and as applied, is crucial to affecting practice in a lasting and meaningful way. Both this goal and its contributory process will therefore lead to a deeper and more meaningful exploration of the ideal of the “learning environment” and its history, impact, and context for the purposes of this thesis.

The three sets of theoretical assumptions, practical considerations, and inherent terminologies (paradigmatic understandings) that support this thesis are most easily discussed under the heading of my role in each. I am a researcher; I am a teacher; I am an architect. I will discuss the implications of each of these roles in the research process, then reconcile and summarize the theoretical underpinnings of the thesis, using the purpose of the research as a unifying element (see Figure 1).
2.1 Purpose through Roles

Deep and systematic engagement with each discipline in interdisciplinary work is crucial to the practical applicability of the research. As seen in Figure 2, Taylor and Enggass (2009) suggest starting with one’s personal philosophies, as I will do by engaging my three roles. The authors further defend the need for a rigorous theoretical dialogue by arguing that good learning environments “begin with values” (p.39). To that end, this section on theory is more in-depth than might usually be expected from a Master’s Thesis. The intent is to offer an example of the process of understanding one’s personal context. The following discussion of my roles takes the
form of a short reflective essay, meant to illustrate the process by which I identify and engage with myself in regards to the research. From this more personal understanding, a multi-faceted theoretical framework will be developed that best supports the overall research purpose.

In the simplest form, my role as a researcher is to answer the research questions and fulfill the research goals. Though simple, these are difficult tasks and made more so by the ambitious meta-goal of an accessible and practically applicable set of materials on facilitating good learning environments. Not only must the research be completed, but the process and the presentation of the research must be rigorously developed with this meta-goal in mind. My previous experience with research has been fairly limited. Aside from my undergraduate thesis in architecture, the experiences have been short term and clearly and narrowly defined. The scope of this thesis, therefore, is my main challenge. In my previous architectural thesis, an interdisciplinary approach greatly added to the value of the thesis. I will depend on the strength of that approach again while continuously checking myself against the primary and pragmatic purpose of the thesis. Much of my previous experience as a teacher has been unorthodox. Very little training and almost no pedagogical studies have left me in an enthusiastic, but inconsistent role. The Education and Globalization program has greatly improved that deficiency, as did my time teaching seventh through ninth graders at the Pateniemi Primary School in Oulu during the Spring of 2016. My current approach to education is now built around a primary principle of a teacher as a facilitator. The verb “facilitate” came to me intuitively upon reflection on my goals as a teacher and continued to perform as I examined the possibilities. To facilitate is to make easier the way forward. To me, this means to make easier the way forward for learners as responsible actors in their own learning and lives. Therefore, my primary goal is learner agency, supported by art-based and democratic methods, as well as authentic content. Both as a designer
and researcher, my particular approach to architecture was shaped by my previous project experiences, which eventually lead me to pursue teaching experiences. “Professional arts practitioner” is the moniker Chalas (2015) gives to this mix of specialties. My role as an architect is equal parts collaborative facilitator and idealistic designer. My design approach focuses on a balance between the self-expression of making and the interpretation of the needs of the context. This is very similar to my approach to teaching, with only a little more emphasis on self-expression over context when designing. This is because I believe that place-making is more effective when architecture has a strong signature aesthetic, as seen with Frank Gehry or Alvar Aalto’s works. The projects that made the largest impact on my approach and goals were, in chronological order, a school design contest in a middle-income suburban context (Figures 4 and 5), an experiential theater in a low-income urban context (Figures 6 and 7), and my undergraduate thesis, a student center in a low-income mixed rural and urban context (Figures 3 and 8). The tension of my self-expression and perspective with the contextual/practical concerns of each project is shown in this summary. My primary goal as an architect is to facilitate contextually relevant learning environments, especially in terms of relevance to the users.
The sub-goals of the research have now been clarified, as well as the complex position from which I undertake the thesis. Having followed Taylor and Enggass’s (2009) initial steps to build a solid theoretical foundation for the thesis, the next step is to reconcile the currently competing theoretical frameworks initiated by each of my roles.

2.2 Reconciling Principles, Fields, and Disciplines

To best reconcile competing fields, disciplines, and principles involved in my study, I will explore them systematically, through the articulation of the paradigmatic parts (as seen in Figure 2 on page 7). All are held as equally valuable and integral to the thesis process. Also, the common thread and underlying purpose of the discussion and this thesis is the ideal of a “good learning environment” and how to approach facilitating one as a teacher. The former will organize the theoretical exposition while the latter will serve as motivation, justification, and reconciling element.
Evolving the initially disparate theoretical assumptions required a step away from the restrictive and normative, all-or-nothing paradigmatic and label-centric mentality of much current research. Biesta (2003) inspired this shift in thought through his articulation of the “Three Unhelpful Concepts” of theory in research (pp.98-99). The unnecessary binary of qualitative and quantitative research and the rigidity of the paradigmatic organization of research are the first two unhelpful concepts and those of most interest (pp.98-99). The issue with the terms qualitative and quantitative is that they have taken on a meaning far beyond their original scope in describing characteristics of data, but now stand for “clusters” of ideals and expectations that are often more of a hindrance than a help (p.99). Paradigms fall under the same issue, with the added problem of forming a sort of nucleus for the clusters, creating an additional level of expectations that are in many ways arbitrary and unsupportive of effective research (Biesta, 2003, p.98). Positivism as another unnecessary and misused label is the third unhelpful concept, building on the issues of the previous two by problematizing the reactionary results of competition between each of the labels and their adherents (p.99). Biesta (2003) asserts that positivism is “an excuse for not having to engage with the real issues. It becomes a rhetorical strategy that simply brands positivists as bad—or the ‘baddies’ as positivists—rather than trying to understand” (p.99).

The classification of these concepts as “unhelpful” by a well-respected researcher is freeing, as I believe was his intention. Released from the need to conform to a pre-existing label and its given and restrictive characteristics within research, I instead am able, even encouraged, to find the mix of approaches and understandings that best support the complex context of content in my thesis. However, this freedom is in tension with the need for accessibility of terms and language for readers. Many existing terms in research theory are easily applicable to my approach and comprehended by the standard reader. To this end, I will apply Biesta’s (2003) suggestion of approaching the “parts” (ontological, epistemological, etc) of a paradigmatic understanding with mostly familiar terms, though often qualified (pp.98-99). I hope to find a balance of existing terms and qualifications that clarify the use of each term in the context of the thesis. I believe this approach will be the most effective in terms of accessibility and ease of practical application of both the process and the results of the research.
At the macro level, this thesis is situated in a European/American context and is focused on issues and best practices in that context. This does not mean, however, that only the dominant cross-cutting contexts within the larger frame are considered. A wide range of economic, social, and cultural contexts are intended to be supported by both the approach and findings of this research. An underlying emancipatory ethic of equity and an emphasis on context as an important aspect of the learning environment are the primary foundations for the scope of this range. The focus on organized learning environments (classrooms, schools, and institutions) narrows the context slightly, but much less in a macro context where nine to twelve years of organized schooling are typically mandatory (European Commission/EACEA/Eurydice, 2015). The overarching intention of the thesis is to be accessible and practically applicable to anyone (living in the macro-context) interested in learning environments and/or the facilitation of them.

2.3 Researcher: Dewey’s Pragmatism Recontextualized

As the presentation and thought process behind the thesis are strongly influenced by a pragmatic view and the thesis is, above all, a research endeavor, I will begin with the theoretical perspective that directly supports the goals of the overarching thesis research. Pragmatism, from a general perspective, is a philosophical and theoretical position that places the practical application of theories, beliefs, and processes as both the core foundation and goal of all interactions (Biesta, 2003; Biesta, 2010; Reich, 2007; Vanderstraeten & Biesta, 2006). Biesta (2010) and many of the other authors on pragmatic theory referenced in this section work from an educational perspective on pragmatism which will be the focus of my articulation of pragmatism in this thesis. The core of this focus is the recontextualization of Deweyan pragmatism to support the issues created by the emerging contexts in education and society (Hickman, 2008; Garrison, 2008; Reich, 2008). The other major and complementary aspects of this pragmatic approach include a recursive, critically evolutionary approach to research design and knowledge creation, as well as the commitment to using authentic learning environments (Biesta, 2003; Charman, 2010; Hickman, 2008). The former will be discussed in more detail later in the section, but the simple understanding is that knowledge and therefore action is never based on a final truth, but on continuous interactions with experiences that teach and are taught (Hickman, 2008). Authenticity will be discussed in more detail in Section 2.4. The basic concept is that learning is most valuable and effective in the long-term if the mental and physical
environments are as similar as possible to those that are standard in life (Charman, 2010). The first theme of critical evolution, growth through experience, reflection, and (re)action, is the backbone of the meta-theory of this thesis, both in ideal and application. The second theme of authenticity to emerging contexts lays the foundation for the majority of the practical concerns.

The epistemological and ontological thrust of the thesis owes much to John Dewey’s original theoretic construct of transactional realism. Transactional realism, as defined by Sleeper (1986) is “a constructivism that holds that knowledge is at the very same time constructed and real” (as cited in Biesta, 2003, p.97). This construct at once clarifies and complicates Dewey’s theory of knowing. The clarity comes from the explication of a realist ontology and the complication comes from the underlying idea of a transactional epistemology, as well as the caveats of this flavor of realism. Biesta (2003) feels that Deweyan pragmatism’s ultimate contribution is the tradition-shattering view of epistemology that it puts forth (p. 105). Dewey (1920) refuses the traditional “mind-world” scheme where we exist separately from “the world out there” and declares instead a “double relationship” (as cited in Biesta, 2003, p. 106). E.G. when we act, we affect our surroundings and, instantaneously, we experience the reflexive reaction of the surroundings to our actions. We thus know by reflecting on the consequences of our actions, which gains us more control over our later actions; we learn (see Figure 10). As understood from this theoretical standpoint, the environment (our surroundings) is a crucial and active part of the learning process, underscoring the importance of understanding what makes a “good” learning environment and how to facilitate one that increases the quality of the learning experience.
Also because of this viewpoint on knowing, Dewey’s realism becomes differentiated from most, as it holds equally valid all viewpoints on the true nature of reality (Biesta, 2003, pp. 107-108; Hickman, 2008; Reich, 2008, p.73). This realism is an especially important underpinning of my interactive constructivist approach to education theory and pedagogy: if all views of reality are valid then the personal knowledge gained through the unique experiences of a learner becomes a crucial element in the learning process. On the other hand, this take on realism problematizes my previous beliefs about architectural theory, as indeed does its epistemological partner. In my experience, architectural theory tends to be unyielding when it comes to what is true, especially in terms of form, function, and beauty (Vitruvius & Morgan, 1960). However, the critical history and approach of Deweyan pragmatism and transactional realism supply the underlying logic.
with which to reconcile these three theoretical approaches (Biesta, 2003; Biesta, 2010; Garrison, 2008; Vanderstraeten & Biesta, 2006). Biesta (2003) especially discussed how to utilize pragmatism’s special set of tools and perspectives in order to approach mixed methods research, which I believe parallels neatly with how I am approaching “mixed theories”. By deeply questioning the formational aspects of the initially competing fields and disciplines, an effective blend of the three can be found to support the practical application of the findings of the thesis, again a prime goal of pragmatic theory (Biesta, 2010; Vanderstraeten & Biesta, 2006). My struggle to understand and interweave these initially competing theoretical approaches has strengthened the rigor of both the thesis and the training curriculum in terms of quality and applicable worth. This was the intent of the steps towards a solid theoretical foundation proposed by Taylor and Enggass (2009). With this meta-understanding of the structural logic and methods of recontextualized Deweyan pragmatism, the specifics of my educational theory can be explored.

2.4 Teacher: Interactive Constructivism

As discussed, Biesta (2003) led to the first steps approaching educational theory. His analysis of epistemology and ontology in balancing mixed methods offer strong positions and vocabulary (p.101-103). Further, his discussion of the importance of roles and purpose in research tie clearly to my articulation and pursuit of roles and their subsequent goals in the thesis (p.103-104). As mentioned before, my educational pedagogy is built on interactive constructivist theory, especially as it relates to the learning environment. As the parent theory of social constructivism is widely popular and known, I will lay only a very brief overview of its history and values, spending more time on the specifics of interactive constructivism, my personal application of the resulting pedagogy, and the underlying ties to the meta-theory of pragmatism (for more on general social constructivism, see Beck and Kosnik’s 2006 book, *Innovations in Teacher Education: A Social Constructivist Approach*). As mentioned previously, the main themes of my interactive constructivist-centered pedagogy are student agency through democracy and art education and methods, authentic learning experiences, and the idea of the teacher as a facilitator.
Social constructivism’s general ontological and epistemological assumptions are that knowledge and reality are created (constructed) by individuals interacting with one another and their environment (Reich, 2007). In some ways, the focal concepts of social constructivism are more narrow than Dewey’s transactional realism, focusing on only the social and person-to-person aspects of the surroundings (Biesta, 2003, p.111). Interactive constructivism is one form of social constructivism that focuses on the context of the learning process in addition to the social themes (Reich, 2007; Reich, 2008). For the purposes of intentional educational processes, I believe that social constructivism, especially interactive constructivism, is an ideal perspective from which to approach teaching. Taking into account the practical (pragmatic) reality of most formal education contexts, learners are rarely in a vacuum or allowed to develop based solely on their personal experiences and reflections. “It is an essential claim of the approach not only to elaborate suggestions for practical instruction, but to reflect on the broader cultural conditions and contexts of learning (Reich, 2007, p.11)”.

I therefore see the active tenets of interactive constructivist pedagogy working in tandem with the meta epistemology and ontology of pragmatism. As a teacher practicing the pragmatic approach of constant critical reflection and adjustment in their pedagogy, interactive constructivism is a vehicle of creation and participation in “concrete, emerging contexts” (Hickman, 2008, p.126). When understood this way, a constructivist approach could even be seen as filling a gap in pragmatic theory by giving more emphasis to the participant’s role in learning. Reich (2008) calls this gap in Dewey’s pragmatism a lack of “Observer” perspectives which leads to an underestimation of the effect of power dynamics in education (pp.71-75). The issue of roles in learning is crucial to my theoretical approach, so I will begin the discussion of my personal approach to education with the idea of the teacher as a facilitator.

Dewey’s conception of experience as a means of better control of future interactions (better from the individual’s perception) has been an important catalyst for my thoughts regarding the role of the teacher in the learning environment (Biesta, 2003, p.106). So then when Dewey’s learners are facilitated in the intentional (formal) learning experience, they are aided in the mastery of their later interactions. Wilson (1995) concurs with this view from an educational theory standpoint, “the teacher serving the role of coach and facilitator” when discussing “constructive’ learning environments” (p.7). An important note: this could easily lead to less meaningful descriptions of efficiency in learning (as seen in the referenced Organisation for
Economic Co-operation and Development (OECD) Education materials), but that is not my goal, or Dewey’s intent, in this theoretical approach to education. I instead would put forward ideas of deeper and more meaningful learning where the learner is allowed and encouraged to take advantage of the teacher’s more extensive experiences. From an interactive constructivist perspective, the teacher would then be especially responsible for facilitating a learning environment that is authentic to the surrounding socio-economic and cultural context.

Reich (2008) and Hickman (2008) discuss recursive interactions with emerging contexts as another central point of Dewey’s philosophy and the interactive constructivist approach. In their chapters of *Reconstructing Democracy and Recontextualizing Deweyan Pragmatism*, both authors place equal emphasis on Dewey’s critical evolutionary naturalism (Hickman, 2008, pp.121-128; Reich, 2008, p.78). This philosophical belief is built on the understanding that the world is natural and everything happens due to natural causes and characteristics (Hickman, 2008). Dewey’s naturalism is evolutionary, which means ever-changing and growing and unfixed, as well as being process-focused (Hickman, 2008, pp.125-128). Hickman (2008) argues that these two tenets are the underlying structure for Dewey’s pragmatic approach to education and learning (p.125). Reich (2008) emphasizes how this evolutionary naturalism reinforces the iterative and democratic (participatory) nature of knowledge creation (pp.74-77).

Hickman (2008) discusses the importance of the critical aspect. He places emphasis on recontextualization and social constructivist knowledge processes, as well as pressing for lifelong learning in that every person should be regularly analyzing and developing their beliefs, traditions, values, and practices in “concrete, emerging contexts” (p.126). This idea of a critically evolving understanding and knowledge of the world is the keystone of the educational theory to be implemented in the case study. The inherent critical mindset refuses normative standards as a given and pushes for reflection and research and deep, authentic interaction with the ideals that shape the world. This construct supports the application of the idea of the teacher as a facilitator, as a person whose role is flexible and whose purpose is to support learners in the best way the teacher has found and continues to find.

Another key concept in Dewey’s philosophy and in a surprising range of the literature reviewed, is that of a healthy and robust (“pluralistic”) and vigorous (“self-correcting”) democracy (Hickman, 2008, p.126) which is supported by education as the core social process for the
creation and maintenance of such a system (also see Garrison, 2008; Gude, 2009; Reich, 2008; Taylor & Enggass, 2009). Gude (2009) brings this ideal together with that of art and art education. She maintains that “[The] belief in the average person’s creative power lies at the root of any democratic society” (p.7). This belief is not only external, but internal due to the “intense awareness with a strong sense of agency” evoked by a deep engagement in an artistic process (Gude, 2009, p.7). Art, at its core, is a mode of expression and a venue for student voices. Gude (2009) therefore lays a compelling line of reasoning to link art to supporting the democratic process. It begins with self-expression, “telling one’s story”, through making and sharing the creative process (p.8). She then proposes that art experienced through quality art education allows us to struggle with the complexity of our identities in a way that is cathartic and affirming, encouraging and giving us the skills to then face with equanimity the complexity of interactions with others (p.9). Art becomes a vehicle for us to share and experience the unique perceptions of others, to explore often neglected themes of spirituality and emotion, for our beliefs to be challenged and strengthened and grown (p.10). These experiences offer the foundation for an engaged and progressive democratic life, partnered with the fulfillment of self-awareness and intentional growth through socio-civic interactions (p.11). Hallam, Hewitt, and Buxton (2014) share Gude’s beliefs, speaking about the need to nurture student voices through art education and emphasizing the need for quality art education. The ideals of democracy and art expand the potential of the facilitative role of the learning environment. Democratic and artistic goals and methods can be understood through transactional realism to encourage practical goals and methods of empowered self-expression, deep and meaningful connections with others and our surroundings, and skills-based learning with which to approach the positive shaping of our world. The last leads to the commitment to authentic characteristics of both surroundings and approach in learning.

Authentic learning environments as an ideal expects methods and physical and mental surroundings that are as authentic as possible, and therefore more valuable, to “real world” situations. (“Real world” here is a cliché but accessible ideal of the standard living situation outside of school, both during and after the formative years.) Common methods include inter-subject learning, environmental awareness, and role playing methods (Meriläinen and Piispanen, 2014). Taylor and Enggass (2009) emphasize the need for architecturally authentic learning environments in her description of the Benjamin Franklin Elementary School, which
was designed to encourage awareness of and symbiosis with its immediate ecosystem through lighting and aperture articulation (Taylor & Enggass, 2009, p.132). Meriläinen and Piispanen (2014) discuss authenticity of teaching methods when describing role playing as an all-purpose method for teaching practical and applicable skills to students, while also covering content knowledge (p.48). The themes of democracy, learner agency through art education and methods, authentic learning experiences, and the teacher as a facilitator are the constantly evolving basis for the interactive constructivist approach and pragmatic goals of the thesis. These themes also stem from my experiences as an architect, so I will now approach the final third of my theoretical assumptions.

2.5 Architect: Holistic Design Theory

Learning environments with regards to the aspects potentially affected or controlled by the actions of designers and characteristics of architecture complicates the previously discussed ontological and epistemological views somewhat. For myself, the idea of architecture tends to immediately become a discussion of Biesta’s (2003) “world outside of itself”, due partially to my training and partially to the normative understanding of architecture (p.105). Architecture at first reflection is monumentally physical, tangible, and subject to scientific laws. However, Reich’s (2008) discussion of observer and agency perspectives along with Dewey’s original participant perspective offers the opportunity to recontextualize the nature of architecture in terms of how we interact with it as a reality, as an ideal, and as a process. There is no need (for this research) in pondering deeply the metaphysical possibilities of the reality of architecture. Pragmatism, again, becomes a tool as I refocus on the goals of architecture, rather than the normative understanding of architecture as a static object. Analyzing in concrete and emerging contexts leads to knowledge of the historical, political, critical, cultural, and normative meanings of architecture from which to continue reflecting and interacting more masterfully with its process (list developed from Hickman, 2008). Ideals touted as “fundamental truths”, such as those found in Vitruvius and Morgan’s (1960) Vitruvius: The Ten Books on Architecture (a standard reading in architecture school), become contextual concerns rather than restrictive rules. Beauty and aesthetics are approached for what they can do for future interactions, not as omnipotent powers that dictate our actions and values. Architecture exists, but was created by the goals and resultant interactions of many individuals and their surroundings.
The reflexive nature of Dewey’s philosophy is, if anything, more valid when reviewing the relationship of the individual and the architecture of their life, each shaping the other continuously. The architect designs; the owner critiques; the contractor builds; the owner decorates, adds, lives; but also, the design becomes inherent and affective to the knowledge of the architect, the owner, and the contractor; the final built product shapes the daily life of the owners, their neighbors, their community. I therefore place architecture as a process subject to human interaction and will build my thesis from that position. In regards to the learning environment, architecture plays a variety of roles, most of which will be discussed in the literature review (see Section 4.2.3). For theoretical purposes, architecture will be understood as a place-making process that either can support or hinder learning (leading to the need for training on the use of the environment in teaching).

Architectural theory in regards to learning environment design is not yet a deeply explored field (Gislason, 2010). Taylor and Enggass (2009) outline a holistic approach to designing learning environments that is key to my approach to the research. Their book, *Linking Architecture and Education: Sustainable Design for Learning Environments*, is also a major resource for the literature review. The main thrust of the holistic approach to learning environments is “to link the disciplines of architecture and education through the investigation and development of architectural programming processes and the remediation of school design based on best educational practices (Taylor & Enggass, 2009, p.xv)”. Their writings encouraged me to implement an intentionally holistic approach that uses architecture and education as a lens to develop learning environments both in theory and practice. Taylor and Enggass (2009), as well as Chalas (2015) and Charman (2010) add to this foundation the need for meaningful interactions throughout the design process with stakeholders in each learning environment. Such interactions are supported by interactive constructivist theory’s focus on socio-cultural contexts. Chalas (2015) and Charman (2010) also broaden the range of what is considered a learning environment, including museums and other institutions, as well as public spaces, offering a new aspect to the pursuit of a holistic understanding. The theoretical perspective of architecture therefore widens our understanding of the learning environment to include not only a much more affective physical aspect, but also a variety of other interdependent factors. Deep engagement with these contexts is supported by the holistic design approach, coupled with the pragmatics goals and structure and constructivist methods so far discussed.
2.5 Reconciliation: Structure, Methods, Goals

In conclusion, the thesis is structured by a recontextualized Deweyan pragmatism, grounded and implemented through an interactive constructivism, and approached and analyzed through holistic design theory, as seen in Figure 9. The goals initiated by each of my roles and their supporting theories give or take precedence according to the needs of the meta-goals of the thesis and the context of each part of the process. The architectural and educational skills gained through their respective roles will also serve the quality fulfillment of these goals, such as the design skills used to develop accessible graphics for the thesis and the pedagogical skills used to develop and implement the teacher training. Regular reflection and adaptation are undertaken through use of the primary pragmatic goal of supporting the facilitation of good learning environments as a touchstone and guide. The practical application of this reconciled theoretical approach will be seen throughout the thick literature review and its initial findings, the selection and implementation of the case study and training methods, the analysis of the gathered data, and the dissemination of the thesis findings and conclusions.

Figure 10. Reconciled Theoretical Structure
3. RESEARCH DESIGN

As seen in the theoretical discussion, I place emphasis on the value of research that explores complex relationships and offers the reader new perspectives and knowledge to customize and apply to the concerns of educational practice. Starting conversations about and supporting new approaches to the interaction of education and architecture in the learning environment is the focus of this thesis. Therefore, a methodology that is qualitative in flavor, but not restricted to the paradigm makes the most sense. The conclusions are meant to offer flexible knowledge and lay a deep context from which to draw on to implement personal methods, not final knowledge that lays out rules of conduct. The value of the thesis, then, is in what the process and conclusions offer to the discussion of learning environments.

3.1 Case Study as a Vehicle for Exploration and Knowledge Co-Creation

The road to the specific methodologies was complex, bouncing between the needs and expectations of the theory and the practical logistics of the study itself. During the first round of literature review, the case study method became a running theme of studies that explored the idea of “training” and dealt with cross-disciplinary themes (Burns & Pichilingi, 2000; Larson, 2004; Feltham, 2012; Chalas, 2015). Further reading into these and other case studies showed a supportive language in terms of the goals of the studies. Themes of co-creation and ownership, the lack of effective training available and the need for a common language, questioning participant roles and knowledge/power discourses within the study format, how to affect long-term learning transfer of skills and application, and the need to balance theory and practice are a few of the salient overlaps (Burns & Pichilingi, 2000; Hansen, 2015; Larson, 2004; Freeman, 2013; Feltham, 2012; Jokela, Hiltunen, & Härkönen, 2015; Chalas, 2015). These ideas have been discussed in the theory and will continue to be discussed as an integral part of both the process and the goals of this thesis. For the methodology, these messages resonated clearly with my theoretical basis, ontological beliefs, and pragmatic concerns. The case study method allows the practical application of the theoretical discussion, following the pragmatic structure of the thesis. The teacher training will engage interactive constructivist theory and methods to support learner agency and the training materials to be used are developed based on the holistic design approach. My skills as an educator will also be called upon as I lead the training. All of these
together combine to offer comprehensive example of both the facilitation of learning environments and teacher training in facilitating learning environments. Thus, the basic three-part layout of the study evolved through the connections between the research goals and the strengths of the case study method.

The case study method and the participant group do not create many issues in terms of procedural ethics in the thesis. The goals and methods of the study were minimally invasive and affected no major or minor area of human rights. However, respect for the participants encouraged the author to protect them from any possible negative situation during or after the case study. For the video and audio recordings, each participant was given a release that allowed use of the footage for educational purposes only, with a clause that they might withdraw from the study or withdraw their release of the footage to me at any time (see release in Appendix 1). The participants will also remain anonymous throughout the thesis. Finally, learner agency was a major goal of the methods and process of the case and training. Every effort was made to make the training relevant, accessible, and valuable. The value of the co-created knowledge from the study was emphasized during the training and will continue to be held as valuable throughout the analysis, findings, conclusions, and later works.

3.2 Parts of a Training-Centered Case Study

Part one of a training-centered case study is an unusually wide and deep literature review of both the ideological and practical context of the study, often called a “thick description” (Becker et al., 2012). The reviewed literature will be presented through a holistic set of perspectives in order to facilitate the start of the discussion of the main themes in current learning environment research. This is followed by a systematic development of a teacher training course, to be implemented with a TAIKA class at Oulu University in Oulu, Finland (primary teacher training program with an emphasis on arts education). Part two sees the training undertaken and several data-gathering methods employed. A qualitative thematic analysis based on pragmatic theory and the themes found in the literature review will be used. Much of the data gathered is in visual form, so a qualitative thematic analysis will be used. The focus of this method is to bring forward the salient themes of learning environments planned during the case, while providing a
descriptive context. This allows readers to see the connections between the theoretical and the practical and gives a foundation for personal exploration, as well as providing viable examples for incorporating the lessons learned into the reader’s own context. In Table 1, the choice of the case study method supports the three research goals by providing an example of a practical application of current themes in learning environment research through a teacher training in how to better facilitate learning environments. The method supports these goals and analysis with exploratory and holistic qualitative characteristics, intentions for expansion of the knowledge base, and flexible and fruitful methods.

Table 1. Case Study Method and Research Goals

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<th>Case Study Method</th>
<th>Research Goals</th>
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<tr>
<td>1</td>
<td>Expand the conversation around learning environments</td>
<td>“Thick” Literature Review</td>
</tr>
<tr>
<td>2</td>
<td>Fills the gaps in practice and training</td>
<td>Example of a training based on current research</td>
</tr>
<tr>
<td>3</td>
<td>Support teacher agency</td>
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Table 2. Tenets of Holistic Inquiry (Taylor & Enggass, 2009, p.24)

<table>
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<tr>
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<th>Tenets of Holistic Inquiry</th>
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<tbody>
<tr>
<td>1</td>
<td>People are a part of, not apart from, the environment</td>
</tr>
<tr>
<td>2</td>
<td>The second principle is that the order of the universe is holistic and inter-disciplinary.</td>
</tr>
<tr>
<td>3</td>
<td>The concept of a split in the body/mind/spirit continuum is in contrast to our natural capacities as whole learners</td>
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In terms of this thesis, a case study is understood as a deep look at one to three cases of a particular event, in this instance, one student teacher training session on how to best facilitate a learning environment (Becker et al., 2012). To prepare for the study, a “thick description” in the form of a wide and deep literature review was undertaken. The width and depth of the review was pursued through a number of factors. In Figure 11 and Table 2, one can see Taylor and Enggass’s (2009) tenets of holistic inquiry into the learning environment which were a primary guiding factor (p.24). Another influence was the credibility, trustworthiness, and triangulation in
qualitative research and how to pursue it, as discussed by Golafshani (2003). One of Golafshani’s (2003) main themes is the value of building on the processes of others, therefore, much of the material mining and culling was inspired by the method employed by Pesonen (2015) in her study of representations in children’s literature. Pesonen (2015) took advantage of major databases and key words to bring forward a wide range of literature from which to focus her final literature review. Finally, an intentional desire for cross-disciplinary information allowed for an expanded set of criteria for the materials to be reviewed. This means the core term learning environment was understood flexibly during the search for materials, so that non-standard but relevant alternatives to school-centered spaces could be explored. Examples include virtual learning environments (VLE’s) as seen in Konert’s (2014) thesis, *Interactive Multimedia Learning Using Social Media for Peer Education in Single-Player Educational Games*, and supportive psychiatric spaces as discussed by Chrysikou’s (2014) book, *Architecture for psychiatric environments and therapeutic spaces*. From this comprehensive perspective, I developed a holistic set of perspectives from which to approach the better facilitation of learning environments. By holistic, I do not mean exactly comprehensively, but intentionally aware and responsive of the complexity and variety of factors that are concerned when discussing learning environments.

To begin the process, key words based on the theoretical and practical aims of the study were used to search major databases of Architectural and Educational academic works, namely “learning environment” and “user”. To cull the thousands of search responses, the abstracts of each piece were searched for key characteristics germane to the focus of the thesis: some discussion of the architectural character of the learning environments, focus on user interaction and input, and discussion of what makes a good/quality/effective learning environment. The 50+ resources left served as the base of my effort to lay a wide and deep ideological and practical context from which to pursue answers to the research questions. In an effort to start towards the goal of a common language for everyone interested in facilitating good learning environments, I work to discuss the materials reviewed in a way that was not restricting and final, but orientational and flexible. The holistic set of perspectives that resulted from that intention are brought forward through a combination of thematic coding and previous experiences in both teaching and learning how to approach architectural issues in a good (read holistic) way. I then seek to reflect my findings in a comprehensive way through the organizational structure of the
thesis, as will be seen in the literature review section. From this orientational device also comes the basis for the lesson plan of the training session. Through this wide and deep literature, I begin to answer the research questions and goals.

3.3 Development and Implementation of the Training Plan

For this study, training is understood as a limited time session made up of facilitators and learners with the goal of specific knowledge and skills transfer in support of the participants’ professional lives. This goal was reached through the use of interactive constructivist theory, where the focus is on learner interactions and their contexts. As the case study supports the goals of this thesis, so too does the concept of a training. Often before, other studies have utilized the case study method to research various forms of training across disciplines (Burns & Pichilingi, 2000; Larson, 2004; Feltham, 2012; Chalas, 2015). Chalas (2015) and Larson (2004) dealt with teaching artists, respectively as facilitators and recipients of training. Burns and Pichilingi’s (2000) and Feltham’s (2012) studies discussed training in business skills for professionals in other disciplines. These studies also gave insights into the organization and implementation of effective trainings. The pairing of training and case study seems to work well, as the goal of a case study is often to provide new information and experiences from which to develop and apply new knowledge and methods. The goal of a training is similar, though the content and format may be more rigid. The efficacy of cross-disciplinary teacher training has been lauded in many recent articles, such as the previously discussed article by Chalas (2015) and Larson’s (2004) article about training drama-focused teaching artists. Chalas (2015) especially offers a compelling argument and tactics for training teachers to take advantage of non-standard learning environments (pp.75-78). Each of these studies offers positive traits and methods from which to develop the training plan.

Interactive constructivist theory shapes the final character and intent of the training. For this training, the expertise and suggestions of the examples above, as well as my co-facilitator, supervisors, and the participants in the training were leveraged to develop a co-creative, open-ended, and productive lesson plan for and with the TAIKA class. Also taken into account were the background and future expectations of the participants. This was done by connecting the overall findings with specific examples from Finnish education policy, the use of Finnish
language supplements and materials, and in the authentic problem-solving methodology of the training. Each of these methods supports the interactive constructivist goals of interactive knowledge creation, critical contextual awareness, and student agency in the learning environment. Chalas’s (2015) suggestions for the structure of a fruitful training are also applicable to the implementation of the case study (Chalas, 2015, pp.76-77). A preparatory session, the main event, and a follow-up action are crucial to what Konert (2014) calls “knowledge transfer”, or the long-term effect on actions relating to the content and ideas of the training (p.20). The training was therefore split into three parts.

Knowledge Session

First is what I term a “ZPD session”, based on Mononen-Aaltonen’s (1998) discussion of Vgotsky’s Zone of Proximal Development theory (pp.191-196).

The zone of proximal development is the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers (Vygotsky, 1978, 86). (As cited in Mononen-Aaltonen, 1998, p.196)

The knowledge session will thus focus on making the students more comfortable with the current ideas and practices of the learning environment (see slides in Appendix 2). The format will alter between a seminar-style and discussion, ending with a hands-on application activity. The goal is to start the process of the students taking ownership of the materials. As discussed in the theory section, ownership is a key part of lasting and effective learning. The alternation between topics and intended fast pace of this session also promote lasting learning from the sessions. Feltham (2012) inspired this aspect of the plan, giving examples of balancing content and pace in such a way that the participants remain deeply engaged in the process. The first session was two hours in length and there was approximately one hour of supplemental materials given to the students to review before the next session. The supplemental materials consisted of a balance of theoretical discussions based on the findings of the thesis before the training began and policy materials from the Finnish context.
Putting the concepts and new perspectives engaged in the first session to work is the goal of the second session (see slides in Appendix 2). This format follows Feltham’s (2012) “apprehend” then “comprehend” breakdown of the training process. He argues that “The theory [knowledge] session solidifies an abstract concept for the participants to understand that is similarly rendered in the actor-based [application] sessions, but this time not by the trainer but by the learner themselves (Feltham, 2012, p.256”).

Application Session

The lesson plan for the second session is to first return to the hands-on application activity from the end of session one and reaffirm the participants’ agency as facilitators and their co-creative role in the training. This will be followed by a quick review of the supplemental materials and then lead into the prompt for the final project. The overall final project prompt was: “Using the Core Curriculum values and Characteristics of a Good Learning Environment and the Six Perspectives for Approaching the Facilitation of a Holistic Learning Environment, develop a plan for facilitating the learning environment described in your group’s prompt”. The group prompts were based on a handout given in the first session asking for situations where teachers might struggle to facilitate the learning environment. Markky Lang and I co-created the prompts based on the students’ suggestions, his research on learning environments in Finland, and our joint experiences teaching in Finnish schools. Students were asked to create a 2D visual presentation with a supplemental 3D expression of their plan.

Reflection Session

The follow-up activity was centered around the presentation and discussion of projects from each group. We finished up with a general discussion of the learning environment as an ideal, and then the training and its effects. The specifics and results of this process will be discussed further in the Findings and Conclusions sections.

Data Gathering

A multi-modal approach will be used to gather the data from the experience holistically for a deeper understanding and allow triangulation of the trends during the analysis phase. The methods of data gathering employed are video and audio recordings of each session, photographs and scans of artefacts created during the sessions, and prompt-driven notebooks.
given to students to record their learning (see the specific materials in Appendixes 2-3). The methods were informed by Moura’s (2006) study of classroom setting interactions. As the data will be gathered in a range of formats, the method of analysis will be similar to that of the thick description method of the literature review, especially in terms of using the six holistic perspectives for approaching the learning environment to organize the dissemination of the findings and conclusions. The focal data reviewed will be four co-created facilitation plans for a variety of learning environments. The goal of the analysis is to discuss the context and reactions to the context in each sub-case so as to highlight the theories, methods, and processes each incorporates. The development and further potential application of the analytical rubric tool will conclude the analysis.

The design of the research seeks to answer the research questions and fulfill the research goals by implementing a three-part teacher training case study that utilizes the reconciled theoretical structure. Holistic design theory is seen most strongly in the thick literature review and analysis, interactive constructivism in the development and implementation of the teacher training, and Deweyan pragmatism in the overall structure of the design. However, the skills and expectations of each are integral to every decision and action. One example of such is the hand-drafted illustrations used in the teacher training materials (see Appendix 2). Another is the classroom methods and lesson planning for the case study (see Appendix 2). The thesis is intended as a personally applicable example of the process, methods, and proliferation of knowledge for the facilitation of good learning environments.
4. THICK LITERATURE REVIEW

Here, let us return to Mononen-Altonen’s (1998) definition of the learning environment: “A learning environment is a dialogue of the fields of vision, charged with the potential for development” (p.198). Understood this way, the learning environment is a phenomenon of almost overwhelming proportion. In order to pare down and contextualize the learning environment, the first step is to summarize the main aspects of the learning environment and their potential effects and reach, drawing on the current literature. This will be done using a set of holistic perspectives developed recursively throughout the literature review process. Finally, I will summarize the current themes as to characteristics of a good learning environment. I will apply the perspectives and themes to the planning and implementation of the case study training in the next section.

4.1 “Concrete and Emerging Context” of the Learning Environment

Consider the initial thoughts a person might have when asked, “What is a learning environment?” The physical aspects may come first, impressions of a classroom or a school. Some might first describe the ideals of education and how learning feels. Occasionally, the primary users of the learning environment will be seen as important, a teacher or student. These three aspects are the start of understanding the holistic reality of the learning environment. From the literature, I have identified six overlapping themes that will lay the basis for my understanding and research (see Figure 12). This approach is informed by Taylor and Enggass’s (2009) “knowing eye”, which encourages the cultivation of a holistic awareness of the learning environment (pp.xv-xviii). The application of the themes to the case study is supported by Dovey and Fisher’s (2014) use of a typology as a “tool for analysis” (p.46). “These are not separate types so much as a simplified framework for understanding and analysis (Dovey & Fisher, 2014, p.46)”. This is a key point in my approach to the literature review. To add further depth to the discussion, each perspective will be explored from the smallest (immediate, which includes the individual and the group) to the largest (global) scale, for which Nuikkinen’s (2009) diagram of “the widening of the learning environment” laid the groundwork (as cited in Kuuskorpi & González, 2014, p.64). As seen in Figure 13, these scales are delineated by physical proximity, as well as the medium of travel and exchange. This range will also be used
to explore specific examples of each aspect in the conclusion of each section. By approaching the learning environment from these six perspectives at a range of scales, the goal of a “thick description” literature review will be fulfilled and a foundation will be laid from which to answer the research questions.

Figure 12. Six Perspectives for Approaching the Holistic Learning Environment

First, a reminder is necessary that these perspectives are meant to be taken holistically. The use of “Mental/Ideal” is not meant to denote a disparate topic, but instead an inseparable, but incomplete, section of the whole picture. And as Taylor and Enggass (2009) state, “all natural things, including humans, function in wholes and processes. There are no parts and the whole is not the same as the sum of its parts” (p.23). The labels and organization of the six perspectives are only meant as a starting point, a flexible suggestion on how to approach facilitating a good learning environment.
Figure 13. Scales of the Learning Environment
4.2 Six Perspectives for Approaching the Facilitation of the Holistic Learning Environment

Mental/Ideal

- How do we think about/ in the Learning Environment?

Figure 14. Examples from the Mental/Ideal Perspective at Each Scale

As seen in Figure 14, a holistic understanding is an important aspect of the Mental/Ideal perspective, laying the groundwork for the discussion of the viewpoints of all scales, individual to global. The individual viewpoint has already been discussed somewhat with Dewey’s participant-based transactional realism. If the learner learns through experience, reflection, interaction, reflection, then what is the learning environment to support that process? If we also accept that each person’s experience is valid, then how is a learning environment that supports multiple learners conceived of and created? Some possible answers to these questions will be explored later in both the second section of the literature review and the conclusions from the case study. However, please take the time to reflect on these questions and others like them as we move through the six perspectives. ‘How can I apply this to my personal context?’ is an important reflection, as well. For now, and for each sub-section of this first part of the thick literature review, I will discuss some theories pertinent to approaching the perspective.
Gardener’s (1893) theory of multiple intelligences can offer some clues as to how to support the individual learning needs of students (as cited in Montague, 2015, pp.2-3). Jung’s theoretical introvert-extrovert continuum can do the same (Montague, 2015, pp.2-3, 10, 56). Both allow educators to understand the innate differences between learners and offer psychological constructs to clarify and support those differences. Social constructivism also offers a view into the individual learning process in a social setting, while interactive constructivism takes a step back and explores the contexts of a group learning process (Reich, 2007). Learning theories and their applications are a crucial part of the pedagogical choice and implementation in the immediate and extended learning environment. Dovey and Fisher’s 2014 study found that many aspects of the learning environment are both affected by and affect pedagogical choice and implementation, as well as each aspect’s level of success in the learning process. Taylor and Enggass’s (2009) discussion of “holistic worldview” and the “soul and spirit of schools” connects with the theoretical and moral underpinnings of this thesis (pp.23-24). The comfortable and direct use of themes such as beauty and balance of the mind and body in the book on school design are echoed in Lillard’s (1972) reading of the Montessori tradition’s idealistic view of the potential of education (as cited in Montague, 2015, pp.2, 37-38). The ideal of the immediate and extended learning environment, as held in the minds of its users, becomes a powerful affecting force on the holistic character of those environments.

At the community scale, I was fueled by similar pedagogical concerns when working on my student center for underprivileged youths in West Virginia (Montague, 2015). The goal was to create an aesthetic of a safe, personalizable “third place” (drawn from Montessori’s “third teacher”) where students could go when not in school or at work (pp.1-5). Gray (2010) also discusses the importance of learning environments as a positive symbol, when explaining the positive impression of local learning centers with well-maintained and aesthetically pleasing exteriors (pp.3-4). Learning environments have the potential to be a positive central focus for local communities, as well as home bases for regional outreach programs (Gray, 2010). There is then the concept of education as a global phenomenon, created through the spreading reach of a normative understanding of what education is and what the spaces are like in which people are educated. Millei and Jones (2014) offer the concept of “social imaginaries”, the normative understandings with which we piece together our ideals of social interaction (p.66). She explains that social imaginaries compete with one another for dominance (p.67). As the world becomes
more interconnected the competition affects increasing and faster changes in the idealistic fabric of each social imaginary as a function of more imaginaries competing and the increasingly diverse viewpoints interacting (Millei & Jones, 2014, p.67). This process creates a “global imaginary”, as the traditional nationalistic boundaries are flexed to the breaking point (p.68). Learning environments again affect and are affected by these social and global imaginaries, reproducing or challenging them depending on the minds involved.

One method that exemplifies this perspective is the use of meditation over detention to great effect in the Robert W. Coleman Elementary School in Baltimore, Maryland (Gaines, 2016). As seen in Figure 15, the meditation is practiced in a “mindful moment room” specifically outfitted to help children who are acting out calm down and talk through what is bothering them. The entire method is predicated on soothing rather than punishing the individual, which then has a positive effect on the immediate and extended learning environment in the form of open communication and better overall behavior. In the further extended learning environment and community, the school runs an after-school program called “Holistic Me” which includes afterschool yoga (Figure 16). Students also take the mindfulness lessons and methods home to their parents: “I came home the other day stressed out, and my daughter said, "Hey, Mom, you need to sit down. I need to teach you how to breathe (Gaines, 2016).” The organizing body
behind these methods, The Holistic Life Foundation, also offers teacher training and hopes to mobilize programs like Holistic Me in as many school districts as possible. Mindfulness is a growing interest globally and the practical applications of its tenets seem to have a lot to offer the facilitation of good learning environments. In this and the following examples, what connections to the other five perspectives do you see?
Physical/Architectural

- How do we physically interact with/in the Learning Environment?

As previously discussed, the physical and mental aspects (as well as the other four) cannot, and should not, be truly separated (Taylor and Enggass, 2009, p.3). So it follows that we will begin with the “ideal” of the physical learning environment and continue with the theme of reflexive relationships between the individual and their surroundings (Figure 17). Lippman (2010) sums up the starting point of this conversation,

Researchers and designers of learning environments often debate whether the learner should adapt to the learning environment or whether the learning environment should adapt to them. Arguably this is the wrong question. A better question is: how does the environment shape the learner and, in turn, how does the learner influence the learning environment? (p.10)

The learning environment in this scenario takes on an active role, a key change from traditional constructivist thought (Lippman, 2010, p.2). Taylor and Enggass (2009) concur with this view, “the physical environment and its ambient quality are active and indispensable parts of the learning process” (p.25). This active understanding of the physical aspects of the learning environment means good learning outcomes are intertwined with a good learning environment.
Taylor and Enggass (2009) call this the “silent curriculum”, an active understanding not often held by educators (pp.25-27). Greenspan (1997) gives an example of the power of the silent curriculum in the negative effect on students’ self-perception created by low quality surroundings (as cited in Taylor & Enggass, 2009, pp.26-27). A positive example is the increased sense of safety in students in well-lit and clean learning spaces (Brković, Pons, & Parnell, 2015, pp.84-85). How then can we materialize and interact with the physical learning environment to support a good overall learning environment? Let’s start with unpacking the physical reality of standard learning environments, again from an individual to global perspective.

From the Deweyan perspective, the learning environment begins with the interaction of the individual with their immediate surroundings: furniture, fixtures, built environment; teachers, other learners, learning tools. What are the physical impacts of each of these resources? Too many learners in a space causes overcrowding which can lead to a sense of being lost or, ownership of a particular desk or locker can give a sense of stake in a learning environment (respectively Taylor & Enggass, 2009, p.26; Montague, 2010). A large part of the role of tools, furniture, and fixtures is played in the realm of ergonomics. Ergonomics and human factors are a set of standards and awareness of the best physical design (least detrimental to well-being in the long term) for products that humans interact with regularly (O’Donnell, Wicklund, Pigozzi, and Peterson, Architects Inc., VS Furniture, & Bruce Mau Design (later referred to as OWP/P, VSF, & BMD), 2010). The size and customizability of a chair, the height of tables, sinks, and toilets, the dominant hand orientation of tools and fixtures, even the amount of counterweight in a door’s operation; all of these are crucial factors to physical (and therefore mental) well-being of users in the immediate learning environment (OWP/P, VSF, & BMD, 2010).

A larger scale aspect of physical effects on health can be seen in the rising importance of non-VOC (volatile organic compounds) materials for finishes, good air quality, adequate lighting and access to natural light, and appropriate temperature levels in the learning environment (respectively OWP/P, VSF, & BMD, 2010; Von Ahlefeld, 2009; Brković et al., 2015; Jaramillo, 2013). Some of Taylor and Enggass’s (2009) examples were already given for the mental health perspective on the extended learning environment, but Brković et al. (2015) and Dovey and Fisher (2014) also discuss the impact of the size and cleanliness of public and transitional space
on student comfort and safety. In my undergraduate thesis and projects, the crucial focus was the effective design of a supportive (good) learning environment. The materials on the walls, the shape of the rooms, even the size of the furniture. The most important aspect of the design, though, was the physical organization of the extended learning environment. Using Jung and Montessori theories, I developed a series of playful paths that allowed users to find their own way to interact with the spaces, whether it was direct or indirect social interaction or direct or exploratory physical interaction (Montague, 2015, pp.29, 37).

The overall architecture of extended learning environments strongly affects the learning culture of larger groupings of learners (Gislason, 2010). OWP/P, VSF, & BMD’s book, *The Third Teacher: 79 Ways You Can Use Design to Transform Teaching and Learning*, shares many examples, such as the results of the inclusion and articulation of play and display spaces. Their goal is to support “Minds at Work” and “Bodies in Motion” (Chapters 2-3). Lippman (2010) illustrates this observation through the example of a technology-based classroom (p.2). He shows how new organizations and resources in the learning environment can be leveraged to support a 21st Century Skills pedagogy. What sort of physical environment would best support your chosen pedagogy? Information and communication technology (ICT) themes lead us to the regional and global impact of learning environments. Kuuskorpi and González (2014) and Starkey (2011) illustrate how the physical learning environment has expanded through the commonplace use of the internet and its inherently globalizing forces. If the traditional learning environment is a classroom, students are now intimately, constantly, and instantaneously connected and interacting with more advanced school facilities, their local communities, their nation, and often international contacts (Kuuskorpi & González, 2014, p.64). These connections work both ways, as global standards for quality in learning environments are set by the OECD and distant places become part of our normal visual landscapes through new communication mediums (Von Ahlefeld, 2009; Starkey, 2011). What are the physical requirements of a learning environment to meet all of these needs at all scales?
My undergraduate thesis offers two intertwined examples from the physical/architectural perspective. In Figure 18, the paths and destinations in the Beckley Student Center were articulated to support a range of interactions, personalities, and desires in a safe “third” space (Montague, 2015, p.vii). For the individual, the focus was on reflexive trust and choice in all their interactions with the space (p.38). Potential group interactions are variable depending on the space type and can be reached by the range of different path types throughout the extended learning environment. To reach these paths and spaces, there are different entrance types connecting to community resources, such as the local YMCA and library whose staff also serve as community partners (p.23). The space, path, and entrance types were developed along the introverted to extroverted continuum and allow students the choice of interaction type, from

Figure 18. Continuum of Space, Path, and Entrance Types (Montague, 2015)

Figure 19. Main Floor of the Central Student Center (Montague, 2015)
isolated to large group activities (Montague, 2015, pp.28-37). In Figure 19, the continuation of this theme can be seen in the campus’s main building (p.58). The architectural design was based on a global range of architectural youth interventions, as well as supplemental interdisciplinary resources about supporting students from disadvantaged areas and backgrounds (pp.8-13). Trust and choice are important ideals among the others discussed in this section, all of which can be nurtured through the careful articulation of the physical learning environment.

Users/Roles

- Who are the individuals in the Learning Environment?

Figure 20. Examples from the Users/Roles Perspective at Each Scale

As seen in Figure 20, the users of learning environments are so varied and their roles so numerous that they often play a central role in any discussion of the learning environment (Kuuskorpi & González, 2014; Von Ahlefeld, 2009). A user is the standard architectural term for the range of possible inhabitants active in a space. Roles is a more complex term, incorporating the user’s position within a given community, responsibilities inherent to that position, and the power to pursue the previous two (Reich, 2008). Other roles that easily come to mind are students, teachers, and administrators, but other major players include parents, maintenance staff, and members of the surrounding community (architects and contractors,
professional guests and speakers, etcetera) (Kuuskorpi & González, 2014, p.68). The needs of individuals can stem from their roles and the resources necessary to fulfill them (teachers and students need appropriate learning spaces for different content; principals need administrative spaces; humans need restrooms) as well as from individual mental and physical needs (handicap friendly facilities, quiet spaces, entertainment spaces). Universal design, universal instructional design, and integrated multicultural instructional design, as discussed by Higbee and Barajas (2007) are theoretical approaches well-suited to supporting the exploration of learning environments that meet the needs of all users equitably. As seen in Table 3, they offer six guiding principles within the primary goals of supporting student development and intergroup relations (Higbee & Barajas, 2007, pp.18-21).

**Table 3. Six Guiding Principles of Integrated Multicultural Instructional Design (Higbee & Barajas, 2007, pp.18-21)**

<table>
<thead>
<tr>
<th>Student Development</th>
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<tbody>
<tr>
<td>• Educational institutions should equally enable all students to learn and excel.</td>
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<tr>
<td>• Educational institutions should help students understand how knowledge and personal experiences are shaped by contexts (social, political, economic, historical, and so on) in which we live and work.</td>
</tr>
<tr>
<td>• Educational institutions should help students acquire the social skills needed to interact effectively within a multicultural educational community.</td>
</tr>
<tr>
<td>• Educational institutions should enable all students to participate in extracurricular and cocurricular activities in order to develop knowledge, skills, and attitudes that enhance academic participation and foster positive relationships within a multicultural educational community.</td>
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<tr>
<td>• Educational institutions should provide support services that promote all students’ intellectual and interpersonal development.</td>
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<tr>
<th>Intergroup Relations</th>
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<tbody>
<tr>
<td>• Educational institutions should teach all members of the educational community about the ways that ideas like justice, equality, freedom, peace, compassion, and charity are valued by many cultures</td>
</tr>
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*Note.* Adapted from Banks and his colleagues’ *Diversity Within Unity*, student development and intergroup relations theory (printed in Miksch et al., 2003, p. 5)

Power dynamics are a crucial aspect here, as they organize social behaviors in the learning environment, as well as being organized itself by the individual characteristics of the learning environment (Reich, 2007). As the design and pedagogy implemented in learning environments
is often shaped by concern for the individual’s needs, the learning environment often shapes the way groups interact with one another at both the immediate and extended scales (Kuuskorpi & González, 2011). Due to this reflexive relationship, power dynamics play an expanding role in the discussion of users and roles in the learning environment. The placement of the teacher in the classroom characterizes their role in regards to the students, whether it be authoritarian or collaborative (Dovey & Fisher, 2014, pp.59-61; Montague, 2010). Dovey and Fisher (2014) discuss the differences between traditional and modern spatial assemblages “as a move from an assemblage of discipline to one of becoming; top-down practices of ‘power over’ make way for student-centered empowerment or ‘power to’ (p.59)”. The authors offer a deep discussion of the foundational theoretical perspectives that lead to those organizations (Dovey & Fisher, 2014). The availability and layout of social spaces also affects social relations by emphasizing sports or supporting quiet study or separating students by age (Brković et al., 2015, pp.85-86). A major focus of my undergraduate thesis was answering the question, “How do I design a learning environment that is good for a range of needs and temperaments?”. At an extended level, the distribution of learning environments in a larger system strongly shapes the hierarchy of the different departments and levels of authority in the school. Low quality outbuildings for the arts, a clear display of the energy use and sustainability of a school, or an overabundance or lack of quality in administrative spaces are all examples of how the extended network of a learning environment can shape the experiences of the users within (Taylor & Enggass, 2009; Montague, 2015, p.i).

The community’s role can either strengthen or weaken the learning environment. Community partnerships hold positive potential, especially for minimally resourced learning environments (Gray, 2010). Parent-Teacher Associations and similar groups can be a voice for positive changes in the immediate and extended learning environment. Ideally, users will also play a role in the betterment of learning environment in the future (Kuuskorpi & González, 2011; Von Ahlefeld, 2009). Part of the intent of this thesis is to offer materials to better equip users and designers for such a goal. Even global standards, such as those set by the OECD’s PEB Organising Framework on Evaluating Quality in Educational Facilities, strongly rely on user feedback (Von Ahlefeld, 2009). At the most meta and micro perspectives, users and their roles are a crucial part of the learning environment. The learning environment could be said to be
created by the learning interactions of the users and the quality of that learning interaction is strongly affected by the quality and character of that learning environment. Understanding the magnitude of roles and needs of users then plays an important part of facilitating a good learning environment.

Kuuskorpi & González’s (2011) study brought together the user opinions of students, teachers, and professionals across six countries (Belgium, Finland, Holland, Portugal, Spain and Sweden) to develop the learning environment of the future. Using a physical scale model of a standard classroom with movable fixtures and furnishings, the students were asked to create their ideal classroom (p.67). The results of this can be seen in Figure 21. The main themes found in the study were a need for versatility in the immediate and extended learning environment and a need to appreciate the learning environment as a holistic entity (pp.69-74). The individual/user-centric nature of this approach is clear. As seen in Figure 22, the immediate and extended learning environment are required to be customizable and flexible for users and support modern pedagogies and methods (p.75). Students, teachers, and design professionals were encouraged to engage in equitable, cross-disciplinary, and international collaboration to develop the classroom plan, reaching back and forth from the immediate to the global learning environment. The study also found that user expectations of the learning environment were very similar across the international borders (p.71). Kuuskorpi & González’s methods and findings all show the potential and power of user engagement with the learning environment.

Figure 21. Optimal Classroom Organization 1 (Kuuskorpi & González, 2011)
What are the meta-processes and goals of the Learning Environment?

The operational culture of a learning environment is described by Kuuskorpi and González (2011) as made up of two pairs of dimensions: societal-individual orientations and formal-informal learning processes (p.66). This construct scaffolds inquiries into the operation of learning environments: How does one person come in and learn, both with and without formal
structure? What is the purpose and drive of their day-to-day activities? How are groups formed and how do they interact with one another? As seen in Figure 23, the answer to these questions is again both shaped by the user and the learning environment. The ability of students to learn well in a given learning environment can be affected by the simplest physical operations, such as the level and frequency of sound from the air conditioning system or the amount of light available (Jaramillo, 2013; Brković et al., 2015). The emotional quality of the operational environment can have ramifications, as well (Brković et al., 2015). Is it a calm or chaotic space? Is it oppressive or comforting? All of the day-to-day functions of immediate and extended learning environments can be affected by the qualities of the learning environment (Finnish National Board of Education (FNBE), 2016, p.27).

At the extended scale, the inward-focused approach to behavior control, punishment, democracy, and morality processes put pressure upon the operation of the immediate learning environment (Kohlberg, 1989). These practices are in part shaped by outward-focused concerns of careers, civic responsibilities, and higher education. Critical awareness of these informal forces and their strong impact on overall learning is an important part of facilitating a good learning environment (FNBE, 2016, p.27). How are students expected to behave and how does the articulation of the learning environment support or not support those expectations? What are the long-term goals of the learning and how are they affected by the immediate and extended learning environment? For example, bad acoustics can cause noise levels to be exacerbated; calming spaces can be a miracle for over-stimulated students; authentic spaces can better prepare students for later career; supportive assembly spaces can better facilitate democratic interaction and growth (respectively Jaramillo, 2013; Gray, 2010; Kohlberg, 1989). Dovey and Fisher (2014) also discuss how a disconnect between pedagogical approach and the spatial assemblage can negatively affect the immediate and extended operational culture (p.50).

In Table 4, The Finnish National Board of Education (2016) offers “Seven Principles that Guide the Development of School Culture” as a starting place for Finnish

<table>
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<th>Table 4. 7 Principles to Guide the Development of School Culture (FNBE, 2016, p.27)</th>
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<td>1. A learning community at the heart of school culture</td>
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<tr>
<td>2. Well-being and safety in daily life</td>
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<tr>
<td>3. Interaction and versatile working approach</td>
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<td>4. Cultural diversity and language awareness</td>
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<td>5. Participation and democratic action</td>
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<tr>
<td>6. Equity and Equality</td>
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<td>7. Environmental responsibility and sustainable future orientation</td>
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teachers to positively approach their immediate and extended learning environments (FNBE, 2016, pp.27-30). The principles engage a thorough range of contexts that affect school culture, as well as goals for their character in the immediate and extended learning environments through time. Moving to the community and regional scales, the operational culture can again answer some long-term concerns.

Community connections such as parent volunteers, guest lectures, and career and entertainment fairs root schools in the local context (Taylor & Enggass, 2009). This is a mutually beneficial relationship, where locals are encouraged to take stake in local learning spaces and students are given much-needed interaction outside of their immediate peer group (FNBE, 2016). Interregional interactions such as sports events and pen pal projects offer even more varied experiences. As explored with Gude’s (2009) article, these varied interactions are a crucial part of increased empathy and caring for others, in turn supporting a healthy democracy. Kuuskorpi and González’s (2014) six-country study highlighted the global need for this uplifting of democracy, or “the users’ desire to develop the school’s operational environment as well as their need to renew its operational culture” (p.69). As discussed, a democratic operational culture offers the functional framework for equity and student voice in the learning environment (Gude, 2009). Atkin (2011) also writes on this theme, using the term “transforming” to underscore the potential of harnessing the operational culture of the learning environment to fulfill these deeper and holistic needs of the educational process. This, she says, is the key to developing learning environments that are concretely supportive of learning in and for a 21st century context (p.26). The ideals of the creators and users of learning environments then come back again to pedagogical concerns at all levels. What is the purpose of learning? How should it be accomplished? The operational culture of learning environments can support or hinder these concerns, as well as supporting or hindering positive changes to them.

A strong example of the relationship between learning environments and their operational cultures can be seen in Dovey and Fisher’s (2014) case studies on the comparative effectiveness of “open” school plans and their effectiveness in relation to the overarching pedagogy of the school. In Figure 24, each case’s “socio-spatial assemblage” is articulated. Dovey and Fisher
Diagrams use different space types in the extended learning environment for each space (Dover & Fisher, 2014, pp.50-53). They then compare the available and supported teaching methods with the pedagogical program of each learning environment (pp.54-61). Individual and group interactions are shown to be pressured by the available space types and the prevailing pedagogy. When those two factors are in conflict, the effectiveness of the immediate and extended learning environment is restricted. This is the reason many “open” plans are seen as bad choices for school design, as the operational culture does not change with the learning environment (p.58).

Dovey and Fisher’s method has the potential to be a launch activity in the facilitation of learning environments, both between students and teachers and between community and design actors (Figure 25). The diagram can come before the space; the socio-spatial parts can be defined by the operational goals of each scale of the learning environment (pp.60-61). Regional and global
standards can be recontextualized through the process, as well, opening the door to effective and up-to-date operational cultures supported by effective and up-to-date learning environments. Dovey and Fisher (2014) show how important critical engagement with the many phases and scales of operational culture can be to facilitating good learning environments.

Community/Context/Reach

- Where is the Learning Environment located from all perspectives?

![Diagram of Community/Context/Reach Perspective at Each Scale](image)

Figure 26. Examples from the Community/Context/Reach Perspective at Each Scale

This thesis is about how to holistically approach a specific context, the learning environment, but the holistic contexts of each specific learning environment must also be deeply engaged (Figure 26). What are the social, historical, political, critical, cultural, and normative contexts of the learning environment (list developed from Hickman, 2008)? What are the major beliefs and cross-cutting issues of those contexts and how do they affect learning environments as a whole? As individuals, learners each form crucial beliefs about who they are and how they are as people. As groups, they test out those beliefs and explore how to be with other people and find their places in the social order that they help to create (Reich, 2007; Taylor & Enggass, 2009). The articulation through the learning environment of themes such as a diversity of cultural styles and resources, standards of quality, and a sense of belonging and orientation are all important parts of these growth processes (Higbee & Barajas, 2007; Von Ahlefeld, 2009;
Montague, 2010; Montague, 2015). Gude’s (2009) discourse on art education illustrates many of these examples: using a diversity of cultural sources for exemplary materials, having flexible mediums for art expression situated in high quality environments, and encouraging self-identity through making. Integrated multicultural instructional design offers a contextually aware pedagogy and methods that refute cultural whitewashing through celebration and normalization of multiculturalism in the classroom (Higbee & Barajas, 2007). Higbee and Barajas (2007) offer a theoretical framework for approaching multiculturalism in the learning environment (as previously discussed on page 43). As discussed in the Users/ Roles section, learning environments affect the users, but also have great potential to affect the surrounding community and ecosystem, through both the extended learning environment and virtual connections, but also through the physical location, orientation, and accessibility of the core learning environment (Gray, 2010; Montague, 2010; Montague, 2015, pp.35-37; Taylor & Enngass, 2009, pp.17-19).

Holistically sustainable learning environments can both support and be supported by healthy social connections to local businesses, volunteer organizations, and governments, as well as a healthy local ecosystem and sustainable attitude (Montague, 2015, p.4 & 23; Taylor & Enngass, 2009, p.19). Brković et al. (2015) offer many examples of sustainable schools that mix this society orientation with an individual one. The US Department for Children, Schools and Families explains this ethic as a “commitment to care: for oneself (our health and well-being), for each other (across cultures, distances, and generations), and for the environment (both locally and globally)” (as quoted in Brković et al., 2015, p.77). A case study of the Fort Pienc school in Barcelona, Spain, found that the community orientation of the school made students feel safer and as if they belonged (Brković et al., 2015, p.84). The school food gardens were also seen as a crucial connection to the natural world (pp.86-87). The success of the student center I designed was leveraged on the same kinds of positive connections with the local community, as well as a respect for and realization of the needs of the local culture (Montague, 2015).

Global themes of learning environments are also starting to recognize the need to respect the social and environmental contexts of each learning environment, supporting weaknesses and building strengths. Global citizen education policies now exist in many places (see Millei &
The Sustainable Development Goals number six, seven, and eleven-through-fifteen call for a new standard of eco-awareness and action and offer global educational strategies for their completion (United Nations, 2015). Studies like Kuuskorpi and González (2014) and Starkey (2011) illustrate the reach that users in learning environments have through the internet. Examples of these new connections include pairs of partner schools all over the world, international petitions and protests, and student-led support groups for refugees. Recognizing learning environments as crucial parts of successful communities would go a long way towards a generationally increasing understanding of how individuals and groups fit into the world, as well as the balance needed between nature and man.

La Red de Innovación y Aprendizaje (RIA), the Learning and Innovation Network, education centers in Mexico City offer an in-depth example of a learning environment that engages with its community and context, as well as having far-reaching impacts on the learners in that community and context (Gray, 2010). The centers offer educational programs and resources to disadvantaged communities (p.1). As seen in Figure 27, each center strives to be authentic to its context and supportive of its community through a variety of methods (pp.5-6). Individual learners are given carefully designed

Figure 27. (Top Left) Variety of Space Types and Contextual Design (Gray, 2010)  
Figure 28 and 29. (Bottom Left and Right) Welcoming, Authentic Entrance (Gray, 2010)
individual work spaces and groups are brought together in clean, bright spaces that are conducive to learning (Gray, 2010, pp.4-5). The extended learning environment is flexible and supports a wide range of learning activities and community events (p.2). In Figures 27 and 29, contextually authentic materials are used to define and furnish the space, such as information desks and wall paneling inspired by local street vendors (pp.2,4). Also in Figures 28 and 29, the exterior and interior entry spaces are designed to be welcoming and uplifting (p.5). The programs offered by the centers are based on an ethic of widespread and effective community outreach. In 2010, RIA had a goal of nearly quadrupling the number of people reached by 2012, going from 60,000 to 230,000 (p.1). According to their website, the network has now reached 800,000 users with 74 centers across Mexico (La Red de Innovación y Aprendizaje, 2016). RIA exemplifies how facilitating good learning environments is often built on a deep understanding and engagement with the complex immediate to global contexts and communities in which the learning environment is situated.

Time/Dynamic

- When is the Learning Environment from all perspectives and how does it change?
This may be the most complicated of the holistic aspects of the learning environment, but the most important point from the time/dynamic perspective is the reminder that nothing is truly static. Kumpulainen and Mikkola (2014) emphasize the dynamism of the learning environment:

All contexts of learning, classrooms and virtual spaces, are centers of multifaceted and complex activities: they are places where intensive social, cognitive and cultural mediation occurs as knowledges and subjectivities meet, cross and resist each other (Rex, Steadman & Graciano 2006). Each learning context is nested by multiple worlds occupied by the same people, but in different roles, striving for different purposes simultaneously (Shulman 1986). (p.11)

Mononen-Aaltonen (1998), Charman (2010), and Gude (2009) also underscore the “elasticity and unboundedness” (Mononen-Aaltonen, 1998, p.196) of socially created realities, especially in the learning environment. As seen in Figure 30, the need to react to these emerging and constantly recreated realities affects all scales of the learning environment. In addition, the developmental phases learners go through internally are another dynamic layer to be considered.

For example, early education is often the critical experience in terms of long term learning success for growing youths (Esping-Andersen, 2007). This awareness was especially helpful when I was trying to holistically facilitate students going through puberty, when classes have the largest range of size, shape, and maturity (Montague, 2010).

Time at the scale of the individual is concerned with the accumulation and the effect of the fourth dimension. How many hours a day are users in the learning environment? What are the built up consequences of their interactions with their environment in that time? Hallam et al. (2014) explored the declining interest in the arts in students age ten to twelve and found that the amount of time given to quality art education strongly affected student interest, even in students considered talented (pp.199-201). At the group level, Kumpulainen and Mikkola’s (2014) dynamic learning environment explores how students at different levels of development and ability interrelate. The immediate and extended learning environments are always present, but always layered in what the architect and theorist, David Leatherbarrow (2009), calls a “patina” of human inhabitance (pp.81-82). This aura is built up over time and negative or positive trends can be hard to overturn once settled (Chrysikou, 2014, pp.45-50). Byers, Imms, and Rothwell-Meehan (2015) looked at the effect of learning actions over shorter lengths of time in the
immediate and extended learning environment, such as how long it takes to adapt spaces to different needs, or to move between different space types (Byers et al., 2015, p.63). These small buildups of operational time can also have huge effects on the character and use of learning environments.

At an extended level, the rhythm of the school day is often decided by the paths between spaces, whether short or long, crowded or spacious (Brković et al., 2015). In the extended learning environment, curriculums are also often deeply concerned with time, hours spent with different subjects and in play, rates of accomplishment (FNBE, 2016; Von Ahlefeld, 2009). There are also external factors. How does the light change through the day? Can you see the seasons change? How do those experiences affect your learning? Learners can spend up to a quarter of their lives in standard learning environments, the cumulative effect of the qualities of those learning environments then takes on even more weight. The environment and learners again have a reflexive relationship. The use over time of the learners shapes the ethos of the learning environment and the characteristics of the learning environment shapes behaviors, as well as instigating reforms (Leatherbarrow, 2009; Taylor & Enggass, 2009).

As societies merge fully into a postindustrial theme, the needs and expectations of education change drastically. 21st century skills are the current defining factors. According to Starkey (2011):

At the start of the digital age, learning in a secondary school context appears to be slowly evolving from a focus on what has already been discovered and prescribed as ‘knowledge’ towards a focus on critical thinking skills, knowledge creation and learning through connections. (p.19)

Also important are critical media literacy skills to supplement more technical skills (Kellner & Share, 2008). Flexibility and adaptability in students is expected as much as in learning environments in order to keep up with the rapid regional and global changes. Only through time can changes be implemented and reviewed, but it is also crucial to maintaining urgency about positive change.

The seamless learning study conducted by Kong and Song (2014) is an interesting implementation of the time/dynamic perspective and the ideal of 21st century skills. “Seamless
“learning” is an approach in which the learning environment shifts seamlessly through the myriad physical locations and digital and analog mediums of a student’s life (Kong & Song, 2014, pp.128-131). Kong and Song used Edmodo (Figure 31), an education-centered social network, as the core digital learning environment during the study. The participants and brief of the study were as follows:

One experienced science teacher and one Primary 4 class with 27 students (15 female and 12 male) were invited from the partner school to participate. The science inquiry focused on a learning unit on rustproofing conducted in six lessons over 2 weeks for senior primary school learners. (Kong and Song, 2014, p.129)

An inquiry-based learning pedagogy was paired with a seamless learning environment in order to explore both the effect of the pairing on the students and the process and potential of teachers facilitating such plans (p.128). Seamless learning environments offer individuals extreme flexibility in when and where and how to work and increased student performance significantly in the study (pp.133-137). In Figure 32, groups were able to communicate easily and at all times to support the rustproofing experiment (p.137). The distinction between and normal dynamics of the immediate, extended, and community learning environments were regularly blurred by the seamless model. Students were also in near constant connection to the internet as a source of problem-solving material during their inquiry-based activity. Kong and Song offer the seamless learning environment as a globally applicable example of modern pedagogies and methods that include 21st century skills and authentic, applicable learning.

Figure 31. Edmodo Education-Centered Social Network (Kong & Song, 2014)
The Six Perspectives on Approaching the Facilitation of the Holistic Learning Environment offer a strong foundation of methods and resources for anyone interested in the better facilitation of their learning environment. That said, a deconstruction of contextual needs through the lens of the six perspectives will most probably yield contradictions and complications of the best practices put forward thus far. The intent of this thick literature review is to offer a deep initial discussion of how to holistically approach the learning environment and to offer example facilitations and methods to be recontextualized and applied to the reader’s personal context. From the reconciled theoretical perspective of this thesis, a good learning environment is the product of these holistic, exploratory processes and a recursive critical engagement with its emerging contexts. The next section will lay out the overarching characteristics expected of a good learning environment in the macro context of the thesis.

<table>
<thead>
<tr>
<th>Inquiry skills</th>
<th>No.(%) of postings on Edmodo</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questioning</td>
<td>7 (1.7%)</td>
<td>What shall I use in order not to make the oil not spill over?</td>
</tr>
<tr>
<td>Exploring</td>
<td>9 (2.2%)</td>
<td>How many ways are there to prevent rusting (with Hyperlink)?</td>
</tr>
<tr>
<td>Explaining</td>
<td>21 (5.1%)</td>
<td>This is the method of using oil to prevent rusting (Hyperlink: iron rusting. Wiki – Wikipedia - the free encyclopedia)</td>
</tr>
<tr>
<td>Evaluating</td>
<td>16 (3.9%)</td>
<td>Good!</td>
</tr>
<tr>
<td>Extending</td>
<td>1 (0%)</td>
<td>Gilded iron or metal can prevent rusting.</td>
</tr>
<tr>
<td>Others</td>
<td>355 (86.7%)</td>
<td></td>
</tr>
<tr>
<td>Coordination</td>
<td>196 (47.9%)</td>
<td>Chu L. don’t forget to bring the hair dryer.</td>
</tr>
<tr>
<td>Social interaction</td>
<td>94 (23%)</td>
<td>You get my phone, Ho Y?</td>
</tr>
<tr>
<td>Greetings</td>
<td>61 (14.9%)</td>
<td>Good morning, everyone!</td>
</tr>
<tr>
<td>News sharing</td>
<td>8 (2%)</td>
<td>The second group got the honor of “Rustproof Experts”.</td>
</tr>
<tr>
<td>Total postings</td>
<td>409 (100%)</td>
<td></td>
</tr>
</tbody>
</table>

Figure 32. Examples and Data on Digital Communication Between Students (Kong & Song, 2014)
4.3 Findings from the Literature Review: Characteristics of a Good Learning Environment

In this section, the current themes in the literature of the necessary characteristics for a good learning environment will be delineated. These themes were developed from a thematic qualitative analysis of the materials included in the thick literature review. Similar to the six perspectives, the characteristics were developed through a thematic analysis of the literature reviewed. Characteristics presented as important in the literature were coded and then synthesized under ten primary themes, which were then formatted as holistic mission statements, as seen in the following. The label of “good” is understood in the meta-context of the thesis and attained through repetitive and emphatic use of the following themes across a wide and deep range of current and well-respected literature. These themes are again to be understood as interdependent and overlapping and are offered as a scaffold for a holistic understanding of the current ideal of a good learning environment. Goals for each scale from individual to global will follow the ten main themes. The materials referenced for each offer practical examples of the themes. The ten themes are: Activity, Adaptability, Atmosphere, Collaboration, Community, Emerging Contexts, Nature, Orientation, Pedagogy, and Universal Accessibility.

Activity

- A good learning environment is explicitly active in the learning process and supports physically active behaviors (Brković et al., 2015; Charman, 2010; Congdon, 2010; FNBE, 2016; Gislason, 2010; Koohsari et al., 2015; Li, 2005; Montague, 2015; Reich, 2007; Taylor & Enggass, 2009).

At the individual level, this means encouraging active learning that engages the mind and body equally. The immediate built environment should be explicitly active, as well, and be recognized and utilized as a crucial affective force in learning. In the extended learning environment, every attempt should be made to engage with the local context in a dually beneficial way. This motivation for meaningful connections should also be felt when interacting with regional and global perspectives.
Adaptability


Adaptability should be seen in the ability of the individual to choose and personalize their environments and the ease and ability of classrooms to be adjusted to best support different learning styles and approaches. Flexibility and variation should continue to the extended learning environment in terms of wide variations of use for different spaces and a wide variation of spaces for different uses. The wider community should be engaged by a variety of roles of the learning environment that meet a greater range of communal needs. The global community should be engaged through flexible mediums of knowledge exchange and co-creation.

Atmosphere


An individual should feel engaged and comfortable in the learning environment. Engagement in the immediate learning environment should be meaningful and continuous and should be supported by attention to all the senses of the body and a variety of teaching methods and material and spatial articulations. Comfort in the immediate and extended learning environment is affected by light and acoustic quality, cleanliness and upkeep, socio-emotional factors, and a feeling of safety, all of which should be regularly evaluated and adjusted to be supportive of the learning process. The extended learning environment should offer a positive foundation for the
community as a central space and place and image embodiment of the ideals of the community. And the immediate and extended learning environments should offer safe and comfortable resources for engaging with the regional and global worlds, as well as modeling the ideal state of being and environment for that world as a whole.

Collaboration

- A good learning environment is both supportive of collaboration and a product of collaboration (Atkin, 2011; Byers et al., 2015; Cleveland et al., 2015; Frauenberger, Good, & Keay-Bright, 2011; Gislason, 2010; Gray, 2010; Gude, 2009; Guldbaek, Vinkel, & Broens, 2011; Hallam et al., 2014; Higbee & Barajas, 2007; Power, Higgins, & Kohlberg, 1989; Kumpulainen & Mikkola, 2014; Li, 2005; Taylor & Enggass, 2009).

Every voice has a right to be heard and affect the learning environment. The learning environment should also support individuals coming together and collaborating. The original extended learning environment should be a result of deep collaboration between the full range of stakeholders and should be resourced and able to adapt to reflect further collaboration. This internal structure of collaborative engagement should then be reflected in the process of connecting with the community, regional, and global scales, to encourage civic responsibility and engagement.

Community

- A good learning environment both fosters a sense of community within its users and connects to the local community and beyond in concrete, meaningful ways (Atkin, 2011; Brković et al., 2015; Cleveland, 2015; Gray, 2010; Grdadolnik, 2013; Li, 2005; Mononen-Aaltonen, 1998; Montague, 2015; “Outstanding Designs”, 2006; Taylor & Enggass, 2009; Von Ahlefeld, 2005).

Users should be supported in creating meaningful social connections and worldviews with one another and their teachers. Cross-disciplinarity and a variety of interests should be encouraged by the articulation of the immediate and extended learning environments. There should be clear and meaningful connections to the local community, with opportunities for intermixing and
mutual growth. The acquisition of community values and skills should be supported by engaging with ever-expanding levels of communities, from local to global.

Emerging Contexts

- A good learning environment is aware of and reactive to its myriad and ever-changing contexts (Atkin, 2011; Brković et al., 2015; Chalas, 2015; Cleveland et al., 2015; Cuyvers et al., 2011; Dovey & Fisher, 2014; FNBE, 2016; Gray, 2010; Guldbaek et al., 2011; Kumpulainen & Mikkola, 2014; Kuuskorpi & González, 2011; Li, 2005; Mononen-Aaltonen, 1998; Montague, 2010; Montague, 2015; Taylor & Enggass, 2009; Wilson, 1995).

The holistic background of each user needs to be recognized and integrated into the learning environment. Their futures also need to be taken into account, meaning there is a need for authenticity to later life of the workings and articulation of the learning environment. 21st century skills, such as critical media literacy, are crucial for the current context and learning environments should be resourced to support the critical development of technological skills. The local context can be a key common ground to be exploited in the articulation of the learning environment. Emerging regional and global contexts also act reflexively with the more immediate contexts, and should be explored, challenged, and critically reflected upon through the operation and articulation of the learning environment.

Nature

- A good learning environment is clearly and deeply connected with its natural setting and promotes themes of sustainability and environmental awareness (Atkin, 2011; Brković et al., 2015; Cuyvers et al., 2011; Gray, 2010; Grdalnik, 2013; James & Simpson, 2012; Kennedy, 2006; Koohsari et al., 2015; Kuuskorpi & González, 2014; Li, 2005; Montague, 2015; “Outstanding Designs”, 2006; Taylor & Enggass, 2009; Von Ahlefeld, 2005).

Individuals should have regular and minimally restricted interactions with the natural settings of their learning environments. Eco-awareness should be incorporated into the built environment, as well. This can happen in the immediate environment through the manipulation of the separators of inside and outside and in the extended environment through sustainable
operational cultures and exposure of the interactions between the built environment and natural processes. Natural settings can be shared with or experienced in the local context and the larger scale impact of sustainable practices should be explicit and supported by action.

Orientation

- A good learning environment should be organized and articulated to instill a sense of holistic orientation in users, including aspects of identity, belonging, location and navigation, ownership and responsibility (Brković et al., 2015; Byers et al., 2015; Cleveland et al., 2015; Cuyvers et al., 2011; Dovey & Fisher, 2014; FNBE, 2016; Gislason, 2010; Gray, 2010; Grdadolnik, 2013; Gude, 2009; James & Simpson, 2012; Laaksonen et al., 2006; Li, 2005; Mononen-Aaltonen, 1998; Montague, 2012; Taylor & Enggass, 2009; Wexler & Luethi-Garrecht, 2015; Wilson, 1995).

Orientational knowledge should be provided and reinforced by the learning environment. For individuals, this means offering resources and environments that support self-awareness and confidence. The immediate and extended built environment should be articulated to allow the formation of groups and group identities, as well as places to merge groups and that encourage discourse. The organization and articulation of the extended learning environment should also offer a clear sense of place and location at multiple scales. A sense of place in the larger world should be explored, as well, through visual and physical connections to the local community, extended relationships with and localized reminders of the regional community, and resources and encouragement to explore global communities.

Pedagogy

- A good learning environment is created, maintained, and evolved to support, and offer a place to develop, the pedagogical aims, methods, and beliefs of the users (Atkin, 2011; Brković et al., 2015; Byers et al., 2015; Cleveland, 2015; FNBE, 2016; Gislason, 2010; Guldbaek et al., 2011; Higbee & Barajas, 2007; James & Simpson, 2012; Laaksonen et al., 2006; Li, 2005; Mononen-Aaltonen, 1998; Montague, 2015; Taylor & Enggass, 2009).
The learning goals of and for individuals should be supported by the resources of the immediate learning environment. The immediate and extended built environments should reflect this commitment to pedagogy in both resources and articulation, offering the most supportive spaces, organization, and tools. The operational culture of the extended learning environment should also be pedagogically defined and supported by the organization and articulation of spaces. The type, approach, and frequency of connections to the local, regional, and global contexts dictated by the pedagogical approach should be a core factor in the development of their relationship to the learning environment.

Universal Accessibility

- A good learning environment should be articulated for and committed to universal accessibility of all of its resources, services, and experiences (Brković et al., 2015; Byers et al., 2015; Cleveland et al., 2015; Frauenberger et al., 2011; Gray, 2010; Gude, 2009; Higbee & Barajas, 2007; James & Simpson, 2012; Wexler & Luethi-Garrecht, 2015).

The increasingly diverse backgrounds, abilities, and needs of users should be supported equitably for each individual. Discourse across and about diversity should be encouraged and enabled through an accessibly wide range of mediums and environments. Power dynamics should be explicit and critically evolved through supporting resources and articulation of the immediate and extended learning environments. At a community level, learning environments should be leveraged to offer needed resources while being enriched from diverse interactions. Again, the illuminating model and results of the more immediate learning environments should offer foundations for positive change to regional and global contexts.

These ten themes and their examples offer a range of possible solutions to currently crucial concerns. The materials referenced are helpful resources in exploring pertinent themes more closely. As with the six perspectives, the themes are meant to be personally contextually examined, reconstructed, and applied. The case study was undertaken using this process.
5. CASE STUDY PROCESS AND RESULTS

5.1 Process and Selected Results

The exploratory teacher training case study was a practical application of the findings of the “thick” literature review. Though singular in case, the study yielded a massive quantity of raw data, including over six hours of audio/video recordings, a detailed field notebook covering development through implementation, student notebooks, and a variety of artefacts from the participant presentations during the final training session. To best support the thesis goals, the analysis of the data was narrowed to the most significant findings. Those findings are the four plans for the facilitation of the learning environment co-created during the training, as well as the overall process of the development and implementation of the training. The explication of these findings will then lead to their analysis through the six holistic perspectives for approaching the learning environment, followed by a concluding discussion of the impact of those findings on the ideal of the learning environment and how to approach its facilitation in the thesis context.

5.2 Development and Implementation of the Training

The development of the training plan was done in recursive sections. The overall structure was developed prior to the start of the training by the researcher alone. From that structure, collaborative meetings were held with Tapio Tenhu, the TAIKA class teacher, Markku Lang, learning environment researcher, and Pia Leppänen-Keränen, another art teacher from the University of Oulu, now working for the City of Oulu. The specific content and methods of the training were developed during these meetings (see Appendix 1 for initial planning). In the week prior to each session, the final materials and schedule were developed by the researcher and then reviewed with the same collaborators. After the first session, student feedback, both direct and indirect, were also included in the planning and material creation process. Students were given materials for each session approximately a week before each session began, as well as a summary in email form.
The primary focuses of the development process were to facilitate the sharing of the findings of the research in an open and co-creative way and to ground the theoretical knowledge in practical applications and contextual examples. This was done through application-based teaching methods and connections to the Finnish context through student feedback, policy documents, and use of Finnish subtitles in class materials. The sessions were implemented over four weeks from October to November, 2016 (see Table 5 for details of each session). Please see Appendix 2 for the complete materials used during the sessions. The first sessions were held in a standard classroom in the Humanities wing of the University of Oulu and the third session was held at Norssi Teacher Training School across the street.

Table 5. Overview of Training Sessions

<table>
<thead>
<tr>
<th></th>
<th>Knowledge Session (1)</th>
<th>Application Session (2)</th>
<th>Reflection Session (3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Date</strong></td>
<td>13-10-16</td>
<td>20-10-16</td>
<td>3-11-16</td>
</tr>
<tr>
<td><strong>Location</strong></td>
<td>KTK 303</td>
<td>KTK 303</td>
<td>Noppa 106</td>
</tr>
<tr>
<td><strong>Primary Goals</strong></td>
<td>AGENCY (toimijuus)</td>
<td>APPLICATION (soveltaminen)</td>
<td>Sharing Presentations and Reflection on Training and the Learning Environments</td>
</tr>
<tr>
<td></td>
<td>- For Teachers in their Current and Future Learning Environments</td>
<td>- Of the Knowledge Session</td>
<td></td>
</tr>
<tr>
<td></td>
<td>COLLABORATION (yhteistyö)</td>
<td>COLLABORATION (yhteistyö)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- For Collective Knowledge Construction of the Learning Environment</td>
<td>- To Facilitate a Challenging Learning Environment</td>
<td></td>
</tr>
<tr>
<td><strong>Schedule</strong></td>
<td>- Introducing the Topic (First 1/2)</td>
<td>- Review Knowledge Session and Supplemental Materials (First 1/4)</td>
<td>- Presentations (First 1/2)</td>
</tr>
<tr>
<td></td>
<td>- Model Application (Middle 1/3)</td>
<td>- Introduction and Planning of Long-Term Applications (Middle 1/2)</td>
<td>- Reflective Discussion (Middle 1/3)</td>
</tr>
<tr>
<td></td>
<td>- Final Application (Final 1/6)</td>
<td>- Wrap-up Discussion (Last 1/4)</td>
<td>- Finish Notebooks (Final 1/6)</td>
</tr>
</tbody>
</table>
The primary data gained from the training were in the form of the researcher’s field notes, audio video recordings of each session, reflective notebooks given to the students, and the four plans for facilitating learning environments developed with and by the participants. The field notes and recordings will be the primary source for an exploration of the process in the following section. There was very little feedback given through the notebooks due to a lack of internal motivation in the participants (to be discussed further in Section 6.1). The restrictions placed on teachers by the availability of money and other resources in the learning environment was the only significant theme, as well as some small suggestions for the aesthetic of the training materials. Of the four learning environment plans, one was developed by the researcher and the participants as a transition from the first to second session, while the other three were developed by small groups as the final activity in the trainings (see Table 6 for more details). Of the three, two were presented during the final session and one was sent by email two weeks later.

### Table 6. Prompts and Materials for the Four Learning Environment Facilitation Plans

<table>
<thead>
<tr>
<th>Group</th>
<th>Prompt</th>
<th>Supplemental Materials</th>
<th>Deliverables</th>
</tr>
</thead>
</table>
| **Initial** | - practical application session  
- four groups, 3-4 members  
- instructional (opetus), activity  
(toiminta), and project (hanke) work sessions  
FACILITATE THIS SPACE!  
- 6 groups, 3 persons each, one perspective per group  
- Collaborate!  
- 15 minutes planning, 5 minutes implementation, 10 minutes discussion | - slides  
- presentation and discussion thusfar | - suggestion for facilitation from one perspective |
| **Project** | - Using the Core Curriculum values and Characteristics of a Good Learning Environment and the Six Perspectives, develop a plan for facilitating the learning environment described in your group’s prompt.  
- Focus on process and collaboration! | - Core Curriculum sections 3.1 - 3.3, 4.1 - 4.3, 5.1, 7.1, 8.1, 9.1  
- Characteristics of a Good Learning Environment  
- Finnish and English language videos and documents regarding the focus of each prompt | - Visual presentation  
- 3D expression  
- photo of a real classroom, model, pop-up, etcetera  
- Notebooks |
| 1 | **Your role(s):** Pre-K Co-Teachers  
Students (What are they like?): 3-5 years old, energetic, various levels of speaking and understanding  
**Number of Students:** 40  
**Materials to be Taught (Subject/Topic):** Outdoor Studies, “Being/Seeing in the Nature”  
**Location (What is it like?):** Public early childhood care facility in the city and local park; a bit crowded and old  
**Resources / Tools Available:** Basic classroom materials, play area in the park  
**Major Challenge:** Managing the many students and keeping them engaged in meaningful learning  |
- [https://www.youtube.com/watch?v=jLelqa884eo](https://www.youtube.com/watch?v=jLelqa884eo)  
- [https://youtu.be/rNZ0d5fGp-U](https://youtu.be/rNZ0d5fGp-U)  
| 2 | **Your role(s):** 2nd grade co-teachers  
Students (What are they like?): 8-9 years old, various levels of interest, participation, and good or bad behavior, some immigrant students who have lived in Finland 1-2 years  
**Number of Students:** 50  
**Materials to be Taught (Subject/Topic):** “Seamless” Learning, Information Communication Technology, Computer “Coding”  
**Location (What is it like?):** Computer lab – small and loud and hot; students’ homes – various  
**Resources / Tools Available:** 20 desktop computers, 10 labtops and 10 tablets, projector and 1 teacher computer  
**Major Challenge:** getting students to work together equally and find the motivation to work from home and in the cramped conditions of the computer lab  |
- [https://youtu.be/lsXtB7xYYd0](https://youtu.be/lsXtB7xYYd0)  
| - presentation  
- handrawn map of proposed learning environment  
- video of one section of lesson plan  |
<table>
<thead>
<tr>
<th>Your role(s):</th>
<th>Teacher and Parent/Community Volunteers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students (What are they like?):</td>
<td>10-11 years old, energetic and interested in the subject</td>
</tr>
<tr>
<td>Number of Students:</td>
<td>25</td>
</tr>
<tr>
<td>Materials to be Taught (Subject/Topic):</td>
<td>Physics (Science and Mathematics)</td>
</tr>
<tr>
<td>Location (What is it like?):</td>
<td>poorly resourced room, small suburban school near a University, tight-knit local community</td>
</tr>
<tr>
<td>Resources / Tools Available:</td>
<td>little funds for school, so out-of-date and minimal materials, BUT community resources from University and volunteers</td>
</tr>
<tr>
<td>Major Challenge:</td>
<td>Forming strong community partnerships in order to use local resources to support lessons in the subject.</td>
</tr>
</tbody>
</table>

  - http://www.opetin.fi/materiaalit/fysiikka-opas/  
  - http://www.luma.fi/materiaalit/  
  - http://www.edutopia.org/article/community-business-partnerships-resources  
  - https://www.youtube.com/watch?v=Lc_8QjI2GPU

Much of the data to be analyzed came from reflection on unforeseen issues during the process. The primary issues were of motivation of the students. Attendance was spotty during the training, little effort was made towards the discussions or the out-of-class work, and the participants claimed to have “already known this”, in regards to the content of the training. The English language barrier was a major factor in these issues, something I had underestimated as an issue. Less time was given for the sessions than expected, which was another underestimated factor. And finally, in the facilitation of our learning environment, I did not follow through on some of my own principles. On the positive side, the participants agreed strongly with the suggestions I was making and shared many methods and approaches during the sessions. The process overall was a great source of learning for me and the materials for the sessions will continue to be useful later on. Also, the massive amount of raw data gathered lays a strong foundation for my continued research into this topic. The student’s direct and indirect feedback in the recordings...
and in my field notes were a large part of this data. Changes I would make upon reflection will be discussed in the Conclusions section.
6. ANALYSIS: FOUR LEARNING ENVIRONMENT PLANS

As discussed, the primary data was gathered in the form of the four facilitation plans for specified learning environments created during the case study, the first of which was implemented during the second training session. The following section will analyze these plans using the Six Perspectives of Approaching the Facilitation of Holistic Learning Environments in order to offer a deep description of both the process of creating the plans and the plans themselves. My architectural skills will especially come forward in the accessible diagrams of the physical/architectural perspective for each plan. To undertake this analysis, a rubric was developed based on the six perspectives, the individual to global scales, and the transactional realist model of learning. The idea of a rubric was inspired by Taylor and Enggass’s (2009) tool-based approach to their book, Linking Architecture and Education: Sustainable Design for Learning Environments. To maintain the goal of trustworthiness in research, the following descriptions are taken only from explicit visual and verbal data given by the participants. However, readers are encouraged to reflect on the data and find further conclusions to fit the rubric. Finally, the major themes and implications of each plan will be discussed and evaluated as initial conclusions in the study. Each plan offers clear examples of the implementation of the Characteristics of a Good Learning Environment, as well as reflective material for teachers in similar situations. The planning process of each also offers potential methods for aspiring facilitators in general. All of this lays the foundation for the concluding discussion in the next chapter covering the effectiveness of the training and the next steps for the overall research.

6.1 In-Training Application

The In-Training Application Learning Environment Facilitation Plan was initiated through a practical application activity for the teacher training participants in the Knowledge Session. To be effected during the following Application Session of the training, the prompt was:

- four groups, 3-4 members

- instructional (opetus), activity (toiminta), and project (hanke) work sessions

FACILITATE THIS SPACE!
- 6 groups, 3 persons each, one perspective per group

- Collaborate!

- 15 minutes planning, 5 minutes implementation, 10 minutes discussion

The groups developed their plans separately, then came together to discuss and combine their suggestions. Figure 33 shows the resultant plan, which was implemented during the following session. The participant groups were encouraged to take the lead on their suggestions at that time. During the implementation of this plan, the participants also began the planning of the other three learning environments. The rubric for this plan will be more developed than those for the following three, as it also includes reflections on the implementation phase. In Table 7, the In-Training Application facilitation plan and implementation is explored, followed by an unpacking of the various goals, methods, and effects of the plan from each of the six perspectives. The effects will be considered in comparison to the first training session. The data for this plan came from my field notes and the audio-video recordings, as well as some notes from student notebooks (see Appendix 3 for materials and screen shots from the data).
### Table 7. In-Training Application Facilitation Plan Rubric

<table>
<thead>
<tr>
<th>Mental/ Ideal</th>
<th>Architectural/ Physical</th>
<th>Users/ Roles</th>
</tr>
</thead>
</table>
| **Current Factors** | - Strangers  
- New classroom | - Repressive space  
- Too much furniture  
- Bad lighting  
- No fresh air | - Strangers  
- Potential for learner agency through feedback |
| **Goal** | - Student comfort | - Open up the space | - Making deep interpersonal connections |
| **Method** | - Moment with lights off and music on at the beginning of the session to calm and transition | - As seen in diagram  
- Open the doors for air and to lower echoes  
- Adjust lights collaboratively for maximum comfort (“spotlight” effect)  
- Excess furnishings out of the classroom during session | - Activities for getting to know one another at the beginning of each session |
| **Impact** | - Happier, calmer, more communicative participants | - Higher light and sound comfort  
- Versatile use of space and furnishings | - Strong start on relationships  
- Unfulfilled potential of learner agency and connections with facilitators |
| **Potential Changes** | - More focus on getting to know one another from the beginning  
- Making sure the learning environment is comfortable from the eyes of the student | - Using a different classroom  
- Trading out furniture  
- Checking student comfort immediately | - Deeply include group leader and point of contact in the training  
- Spread out interpersonal activities throughout the training  
- Find a contextual medium for student feedback |

<table>
<thead>
<tr>
<th>Function/ Operation</th>
<th>Community/ Context/ Reach</th>
<th>Time/ Dynamic</th>
</tr>
</thead>
</table>
| **Current Factors** | - Very loud  
- Confusing flow of training | - Second language discomfort | - Tight time limit  
- High expectations for amount to be achieved |
| **Goal** | - Comfortable learning flow and atmosphere | - Comfort in the second language atmosphere | - Active but steady work flow |
| **Method** | - ½ groups leave the class so that everyone can hear better | - Chances to speak Finnish to clarify concepts and learning | - Schedule posted  
- Regular clarification of goals |
Mental/Ideal

The mental atmosphere of the room was lead strongly by the students’ focus on their comfort in the learning environment. After assembling in a circle, we turned the lights off and had four minutes of classical music chosen by the mental/ideal group. The participants visibly relaxed and spoke in lower tones throughout this session, as was the goal of the plan. After the music, the participants suggested an ice breaker of names and hobbies. There was plenty of laughing and eye contact during this phase. The participants were very engaged during the following short lecture and understood the prompt given for the facilitation plans project more easily and quickly than during the presentation of the in-training plan prompt in the first training session. They were very animated during the initial planning phase and very talkative when we returned to the circle to share initial ideas. Some then stayed and worked more on their plans. Others left to work more in a different location or to move on to different things. All seemed comfortable in their right to do this. Overall, the mental/ideal plan seemed to have been effective at opening students up and raising the mental comfort in the learning environment.
The physical layout of the room was executed primarily before the participants arrived, in order to save time. Figure 34 shows the layout chosen by the students. For the physical aspect of the circle phase, there was a discussion on whether to sit in chairs or on the floor. Chairs were chosen and then we experimented with the lighting to find the setup most comfortable for everyone. The music phase was held with only the emergency lights on. We did not end up propping open the doors or removing the excess furniture as no follow-up discussion was initiated by the students. This may have been due partially to less excess furniture in the chosen layout, which included many previously unused tables in the group work area. In the end, we did not use the “U” lecture seating at all, instead using the circle area solely in a variety of “U” and “O” organizations. Overall, the space was still not quite right for our group, but the participants managed to break the larger whole into workable parts, while also supporting light and sound comfort.

Users/Roles

As seen in the Mental/Ideal section, user roles and relationships were much more comfortable during this session. The circle was awkward at first, but quickly became more comfortable as we shared and knew more about one another. With no follow-up plan to the music and ice breaker, we did falter momentarily in terms of motivational purpose. Exploring the project briefs, however, brought us back to focus quickly. Though during the second circle, students were hesitant to give feedback on one another’s plans. “Sounds good” was often the extent. One user was also underserved and underused: The professor of the participant group ended up in a

![Diagram](image.png)

Figure 34. In-Training Application Physical/Architectural Diagram
sideline position for much of the session. There was a spark when he was included momentarily during the icebreaker, but that potential was not intentionally followed up. Overall, the plan for the users and roles perspective of the learning environment was effective, but somewhat underutilized and short-lived.

Operation/Function

The operational culture shifted back and forth between student-led and teacher-led; internally motivated and externally motivated. The perspective groups generally had to be heavily prompted to put their suggestions to action. Part of this was the uncertainty seen in the interpersonal roles and a larger part was due to the atmosphere caused by training in a second language. The professor of the group, again, was an important though underutilized part of the operational culture. His previous relationship with the participants could have eased the cold call nature of the training. However, the participants were definitive on their opinions of the plan for the learning environment and shaped it accordingly. The operation/function group’s suggestion of students being able to leave the immediate learning environment seemed to relieve stress. Also, the regular shifting of activities meant that the session was very active. Especially successful was the transitional act of laying out the prompts used in the next three facilitation plans in the group work area for the groups to peruse and decide on. Overall, the operational culture functioned as a motivating structure for the training session, though fell short of the expected level of internal motivation and learner agency.

Community/Context/Reach

In terms of intentionally following the plan from the Community/Context/Reach perspective, I did not perform very well as the lead facilitator. However, in contrast to the general lack of independent action discussed in the Operation/Function section, the participants and professor regularly gave themselves the opportunity to speak and clarify in Finnish. I realized afterwards that I struggled with being on the outside of those conversations. The professor played an important role as clarifier and sounding board after the final prompts were assigned. I followed his example after the participants had time to develop some initial ideas, especially in clarifying the deliverables (the use of 2D and 3D in the prompt was slightly confusing for the participants). I overled initially, underestimating the experiences of those participating and the need for a moment to adjust to the second language. In the end, there was a significant amount of
camaraderie and high spirits in the phases when the students were brought together. Overall, the needs of the context and community were met mostly by the participants and their professor rather than being met equally by myself as the primary facilitator, an issue which underlies many of the issues to be discussed in the final conclusions.

Time/Dynamic

The schedule and dynamics of the session were complex. Between late arrivals, a shifting operational culture, and early exits, there was rarely a status quo of participation and activity. Posting the schedule on the board prior to the start gave the session something to lean on (Figure 35). Also implemented was the suggestion for regular clarification of goals and tasks, often done through the professor of the group in Finnish. As mentioned in the Operation/Function section, this seemed to balance the group’s motivation to move forward and stay engaged. However, I realized the crunch of a time shortage was still felt in this session. There was tension between the list of goals on the schedule and the varying availabilities of the participants. I even caught myself checking my watch once during the “relaxing” music session. Overall, the timing and dynamics of the session gave an active, high-achieving session, though not without stress or tension.

Figure 35. Session Schedule as Posted

The focus of this facilitation plan was to fully use the potential of an improperly matched learning environment in a way that supported student comfort and a feeling of safety/confidence in engaging with the session from the beginning of each. Multiple types of working and interaction were created by the varying organizational and operational methods. The two major challenges of this prompt were a cold start with the participants and the use of English as a second language. These issues were in most part answered by the primary Characteristics of a Good Learning Environment seen in this plan: Atmosphere and Collaboration. The overarching goal of student comfort was well addressed and the process was collaborative from start to finish. In the next three sections, we’ll explore the facilitation plans created during this second training session, followed by a discussion of the rubric tool.
6.2 Prompt Number One

During the in-training application planning session, four potential prompts from which to choose were given to three groups of participants (see the unused fourth prompt in Appendix 2). The initial planning was done at the end of the Application Session, followed by a short discussion of each group’s ideas, then the groups dispersed to continue working on their own schedules before presenting their ideas during the final training session. The prompt the first group chose was:

- Using the Core Curriculum values and Characteristics of a Good Learning Environment and the Six Perspectives, develop a plan for facilitating the learning environment described in your group’s prompt.

- Focus on process and collaboration!

Your role(s): Pre-K Co-Teachers

Students (What are they like?): 3-5 years old, energetic, various levels of speaking and understanding

Number of Students: 40

Materials to be Taught (Subject/ Topic): Outdoor Studies, “Being/Seeing in the Nature”

Location (What is it like?): Public early childhood care facility in the city and local park; a bit crowded and old

Resources / Tools Available: Basic classroom materials, play area in the park

Major Challenge: Managing the many students and keeping them engaged in meaningful learning

Table 8 shows the rubric for this group’s facilitation plan. A natural and extended learning environment was chosen to host an orienteering task given to pairs of students. Each pair are provided with a compass and waterproof map (Figure 36), then asked to find their way through the local Botanical Gardens while completing four tasks given upon arrival to each location on
the map. The data for this plan came from the group’s presentation during the final session, my field notes through from preliminary planning through to the presentation, a drawn map of the extended learning environment, and a video roleplay of one of the tasks.

Figure 36. Landmark Map Drawn by Group One

Table 8. Prompt Number One Facilitation Plan Rubric

<table>
<thead>
<tr>
<th></th>
<th>Mental/ Ideal</th>
<th>Architectural/ Physical</th>
<th>Users/ Roles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Factors</strong></td>
<td>- Nature</td>
<td>- Botanical Gardens</td>
<td>- 40 Pre-K Students</td>
</tr>
<tr>
<td></td>
<td>- Young, energetic students</td>
<td>- Large natural space</td>
<td>- Co-Teacher Pair</td>
</tr>
<tr>
<td><strong>Goals</strong></td>
<td>- Appreciating the Natural Setting</td>
<td>- Appreciating the Natural Setting</td>
<td>- Meaningful Learning</td>
</tr>
<tr>
<td></td>
<td>- “Being” in the Nature</td>
<td>- “Seeing” in the Nature</td>
<td></td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>- Exploratory and interdisciplinary aspects of orienteering tasks</td>
<td>- Physicality and location of orienteering tasks</td>
<td>- Recruiting further staff for less restrictive supervision</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Student pairs</td>
</tr>
<tr>
<td><strong>Operation/ Function</strong></td>
<td>- Semi-controlled nature-based experience and skills acquisition</td>
<td>- Minimal immediate resources</td>
<td>- Tension of a natural learning environment with the facilitation of a large young group</td>
</tr>
<tr>
<td><strong>Community/ Context/ Reach</strong></td>
<td>- Engaged and interdisciplinary learning</td>
<td>- Utilizing local resources</td>
<td>- Balancing control with exploration</td>
</tr>
<tr>
<td><strong>Goals</strong></td>
<td>- Exploratory and interactive aspects of the orienteering tasks</td>
<td>- Botanical Garden location</td>
<td>- Exploratory and interactive aspects of the orienteering tasks</td>
</tr>
<tr>
<td></td>
<td>- Recruiting further staff for less restrictive supervision</td>
<td>- Recruiting parent volunteers</td>
<td>- Recruiting further staff for less restrictive supervision</td>
</tr>
</tbody>
</table>
Mental/Ideal

“In the Nature” is a term I regularly hear from a variety of Finnish professors at the University of Oulu. When planning the prompts, Markku Lang also used the phrase. “Being and seeing in the Nature” came from Pia Leppänen-Keränen during a class on art education methods. The participants used all three phrases comfortably, as well. The phrases and the ideal they represent have been experienced as meaningful to Finns, especially teachers, so they were used in this prompt to convey the deep importance of natural experiences and appreciations in Finnish education. In addition to the “being and seeing” goals, the group introduced an interdisciplinary goal. As seen in Table 9, the orienteering task and sub-tasks were planned to involve math, art, science, and health education concepts and activities. The orienteering tasks anchor students in their reality through mental and physical operations. On the other hand, from a planning perspective the task was daunting. Two participants called forty students outdoors a “nightmare” and one followed up that she “could not imagine this being our task in real life”. Overall, the ideal of “the Nature” was upheld and the engagement of the students supported by the plan, though the terms of the prompt may have left the mental state of the teachers in a tenuous position.

Table 9. Interdisciplinary Orienteering Tasks

<table>
<thead>
<tr>
<th>Task</th>
<th>Concepts</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Collect and correctly dispose of trash</td>
<td>Sustainability, Responsibility, Health</td>
</tr>
<tr>
<td>2. Collect three leaves and two sticks and make an art work</td>
<td>Math, Art</td>
</tr>
<tr>
<td>3. Find an animal and draw a picture</td>
<td>Natural Science, Art</td>
</tr>
<tr>
<td>4. What do you hear? Draw or write a description</td>
<td>Natural Science, Art, Writing</td>
</tr>
</tbody>
</table>

Physical/Architectural

The group chose to use the Botanical Gardens in northern Oulu, Finland, for their plan without any supplemental traditional learning environment. As show in Figure 37, the Gardens are made up of three parts: wild forest, tame park, and a central building lot. Throughout the park, the planners placed four waterproof sheets marked with a large red “X” and the task for students to complete during the orienteering exploration. The tasks are meant to engage a wide range of
senses to thoroughly fulfill the goal of “being and seeing in the nature”. For the facilitators, the natural learning environment chosen is a large space to cover. Solutions to this issue will be covered in the next section. Overall, the physical aspect of the plan is exciting and full of potential from the individual to extended scale, though possibly hard to manage.

Figure 37. Prompt One Botanical Gardens Map

Users/Roles

In Figure 38, one of the planners can be seen role playing the task activity. Students are cast in the role of skilled explorers of their natural learning environment in this plan. The pairs are responsible for each other and the completion of their tasks. However, part of the reason the planners were so overwhelmed by this prompt is the vast range of abilities and needs in students three-to-five years old. A partial solution was to recruit extra teachers to help supervise the outing. One participant stated flatly that she “would not go anywhere with three years old”, to which another replied, “her kid has been in this kind of orientating and she had no idea”, which greatly surprised the speaker. The plan is again very supportive of the

Figure 38. Orienteering Roleplay
students having a meaningful experience in the Nature, but difficult, though not impossible, for the facilitators to undertake.

Operation/Function

The overall operational culture is exploratory and student-led. Pairs of students orienteer through the gardens, supervised and facilitated by their teachers. Following the landmark map seen in Figure 35, students go through the five tasks while discovering the Gardens from various sensual perspectives. From the planning perspective, the participants were still worried about losing control. Overall, the operational aspect follows the same imbalance between the functionality for students and the lack thereof for the facilitators. (A meta-perspective note: During the discussion and presentation, there was also difficulty with translating and pronouncing the words “Botanical Gardens” and “orienteering”.)

Time/Dynamic

There was no explicit discussion of a schedule, only the implication of the time needed to complete the four tasks. In terms of dynamics, though, the tension between supporting student exploration and satisfying facilitator concerns for the control of the learning environment was obvious throughout this plan. Natural settings for learning are considered crucial to current best practices as well as the the growing trend of sustainability education, but teachers will need the resources and training to effectively facilitate these kinds of learning environments.

The focus of this facilitation plan was to use a local, natural, and non-standard learning environment to teach a simple, practical lesson in orienteering while focusing on appreciation of and interaction with nature. What was most successful in the plan was seen in the fulfillment of the Activity, Nature, and Orientation Characteristics of a Good Learning Environment. High levels of physical activity and intentional engagement with the natural learning environment setting intertwine the first two. The exploratory and roleplaying nature of the orienteering tasks exemplifies the last. The major challenges of this prompt were how many students there were and the stresses of managing them in a large, uncontrolled space, as well as defining “meaningful learning” for so young a group. In contrast, a much more traditional learning environment is engaged in the following plan.
6.3 Prompt Number Two

The prompt the second group chose was:

- Using the Core Curriculum values and Characteristics of a Good Learning Environment and the Six Perspectives, develop a plan for facilitating the learning environment described in your group’s prompt.

- Focus on process and collaboration!

Your role(s): 2nd grade co-teachers

Students (What are they like?): 8-9 years old, various levels of interest, participation, and good or bad behavior, some immigrant students who have lived in Finland 1-2 years

Number of Students: 50

Materials to be Taught (Subject/ Topic): “Seamless” Learning, Information Communication Technology, Computer “Coding”

Location (What is it like?): Computer lab – small and loud and hot; students’ homes – various

Resources / Tools Available: 20 desktop computers, 10 labtops and 10 tablets, projector and 1 teacher computer

Major Challenge: getting students to work together equally and find the motivation to work from home and in the cramped conditions of the computer lab

Table 10 shows the rubric for this group’s facilitation plan. The group chose to restrict themselves to the insufficient traditional learning environment given. A drastic reorganization of the room supports the main lesson in coding. Students move through stations and the limited resources available in pairs. The final goal is to create a digital story together as a class using a simple programming app. The data from this plan came from the group’s presentation during the final session, my field notes through the preliminary planning to the presentation, a drawn classroom plan, and a video of a mock-up of the classroom plan’s conditions.
Table 10. *Prompt Number Two Facilitation Plan Rubric*

<table>
<thead>
<tr>
<th></th>
<th>Mental/ Ideal</th>
<th>Architectural/ Physical</th>
<th>Users/ Roles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Factors</strong></td>
<td>- Restrictive, overwhelming space</td>
<td>- Loud, hot space</td>
<td>- 50 students</td>
</tr>
<tr>
<td></td>
<td>- New content for young students</td>
<td>- Minimal resources</td>
<td>- 2nd grade co-teachers</td>
</tr>
<tr>
<td><strong>Goals</strong></td>
<td>- Agency with coding skills</td>
<td>- Flexibility</td>
<td>- Collaboration</td>
</tr>
<tr>
<td></td>
<td>- Internal motivation</td>
<td>- Physical comfort</td>
<td></td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>- Project-based learning</td>
<td>- Station system</td>
<td>- Project-based learning</td>
</tr>
<tr>
<td></td>
<td>- Common final goal</td>
<td>- Open windows</td>
<td>- Pair autonomy over a story section</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Drastic reorganization of the room</td>
<td></td>
</tr>
<tr>
<td><strong>Operation/ Function</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Minimal resources for complex, technical content</td>
<td>- Isolation learning layout</td>
<td>- Modern content</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Lack of resources</td>
<td>- High expectations</td>
</tr>
<tr>
<td><strong>Goals</strong></td>
<td>- Student-led</td>
<td>- Collaboration</td>
<td>- 21st century skills</td>
</tr>
<tr>
<td></td>
<td>- Continuous meaningful engagement</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>- Project-based learning</td>
<td>- Project-based learning</td>
<td>- Use of the story app and each available device</td>
</tr>
<tr>
<td></td>
<td>- Station system</td>
<td>- Pair system</td>
<td>- Time for final viewing session</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Common final goal</td>
<td></td>
</tr>
</tbody>
</table>

Mental/Ideal

The potential state of distraction caused by the loudness of the room worried the planners from the second group. They chose their lesson plan accordingly. Students were encouraged to stay on task and engaged through the collaborative story project. The students and teachers would, as the verbal presentation described, “create together a story” and be rewarded for their diligence with a showing of the completed project. Attention spans were also served by the breaking up of the lesson into three work station phases. The work stations themselves offer motivation, through fresh interactions with technological resources and programs. Overall, this plan offers strong support for the 21st century skills ideal and a complementary mental atmosphere of motivated collaboration towards a common goal.
Physical/Architectural

As discussed, the planners chose to limit themselves to the classroom given in the prompt, but deviated drastically from the standard learning environment setup. Rather than trying to cram all the students into desks, they instead capitalized on the mobile nature of two thirds of their technological resources. The center of the room is cleared of heavy furniture and strewn with pairs of comfortable floor cushions (Figure 39). The pillows are color-coded to facilitate the station system during the lesson. They also muffle reverberations and lower the ambient noise level in the classroom. Opening the windows joined with this airy setup to combat the machine and person-generated heat. Overall, the planners laid out an impressively workable physical layout given the limited resources available.

Figure 39. Prompt Two Classroom Plan

Users/Roles

Students were placed in pairs to make up for the lack of resources and to facilitate collaboration. The participants were again concerned with the number and youth of the students. Due to the modern nature of the content, the planners also expressed doubt as to their success in the teaching role. The motivation of a common goal discussed in the Mental/Ideal section begins to deal with these issues by creating a structured flow through the lesson. Each student pair is also given autonomy over their section of the story. Hopefully, this allows ownership and stake in
the project for each student and encourages positive behaviors. Figure 39 shows the planners roleplaying a mocked up version of their plan. Overall, the relationships of users in the immediate learning environment are collaborative and the common project has a student-led focus in this aspect of the plan.

Figure 39. Planners Roleplaying

Operation/Function

The operation/function aspect of this plan was carefully articulated to be both collaborative and skills focused. Station by station, students are engaged with the programming and each other. A factor to help with the loudness is the planners encourage students to use online chats for communication outside of their pair. This connects pairs without disrupting the immediate collaborative flow of work, as well as offering a record of the project process. Other groups were not as convinced by this plan, one participant saying, “It’s [the loudness] going to be a problem still”, following up with “You’d have to, like, tape up their mouths”. Also highlighted by the planners was a warm-up session before the class got underway and a feedback session after the showing of the completed story. These transitional moments allow students to ease into the project mindset and then critically reflect afterwards. Overall, the teachers are very much facilitators of collaborative skills acquisition; the students lead the creation and learning process through the project.

Figure 40. Coding Classroom Mock-Up
Community/Context/Reach

The community focus of this plan is on the students in a 21st century skills context. They are encouraged to collaborate and co-create a story while building their interpersonal skills. The cushions add an air of comfort to the immediate learning environment, supporting this goal. As the students make a new story together, they also have the opportunity to share their personal stories. Overall, the plan offers support to meaningful connections in the immediate learning environment.

Time/Dynamic

Time/Dynamics strongly affected the core content of this plan. Younger and younger students are expected to engage deeply with technology, even with technical aspects like coding. Though the teachers had minimal resources, they maintained high expectations for the technical skill building to be accomplished by the students in this plan. The use of the story-making application also shows an emerging dynamic in current learning environments between digital and analog mediums of learning. No specific schedule was laid out, but the structure of the schedule was clear in the articulation of the warm-up, rotation across stations, viewing, and feedback phases in the plan. Overall, this plan offers answers to a challenging current dynamic in learning environments, seen in the tension between minimal resources and high technological expectations for learning.

The focus of this facilitation plan was to keep students engaged and comfortable in a poorly resourced learning environment. The students in the prompt were engaged in a story-making coding project, working in pairs and individually on each of the available resource types. The major challenges of this prompt were how many students there were and the lack of resources in the learning environment. However, this facilitation plan answered the major issues through strength in the Adaptability, Collaboration, and Emerging Contexts Characteristics of a Good Learning Environment. The first was not at all a factor in the initial learning environment. The planners themselves became adaptable and found a flexible solution to the lack of resources. Collaboration was supported through the entire project-based process. Adaptability was a partner factor in the support of Emerging Contexts as the planners developed an engaging and potentially highly effective lesson plan for supporting technological skills acquisition. The next
group explored similar modern content, but in a larger range of learning environments than yet discussed.

6.4 Prompt Number Three

The prompt chosen by the third group was:

- Using the Core Curriculum values and Characteristics of a Good Learning Environment and the Six Perspectives, develop a plan for facilitating the learning environment described in your group’s prompt.

- Focus on process and collaboration!

Your role(s): Teacher and Parent/Community Volunteers

Students (What are they like?): 10-11 years old, energetic and interested in the subject

Number of Students: 25

Materials to be Taught (Subject/Topic): Physics (Science and Mathematics)

Location (What is it like?): poorly resourced room, small suburban school near a University, tight-knit local community

Resources / Tools Available: little funds for school, so out-of-date and minimal materials, BUT community resources from University and volunteers

Major Challenge: Forming strong community partnerships in order to use local resources to support lessons in the subject.

Table 11 shows the rubric for this group’s facilitation plan. The group developed an inter-subject science and math lesson using the University of Oulu robotics lab, the Oulu Observatory, Oulu Public Library, and the Oulu Science Center, as well as parent volunteers. This impressive range of learning environments is meant to support a long-term, hands-on learning project in the maths and sciences. The data from this plan came from slides sent from the group after the final presentations and my field notes through the preliminary planning (see slides in Appendix 3). This group were not present during the final presentations and were not available for further discussion of their plan.
Table 11. Prompt Number Three Facilitation Plan Rubric

<table>
<thead>
<tr>
<th></th>
<th>Mental/ Ideal</th>
<th>Architectural/ Physical</th>
<th>Users/ Roles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Factors</strong></td>
<td>- Enthusiastic students</td>
<td>- Basic suburban school</td>
<td>- 25 4th Graders</td>
</tr>
<tr>
<td></td>
<td>- Lack of resources</td>
<td>- Standard Finnish classroom</td>
<td>- One teacher</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>- Extra-classroom volunteers</td>
</tr>
<tr>
<td><strong>Goals</strong></td>
<td>- Interdisciplinary content</td>
<td>- Mine external resources</td>
<td>- Student-initiated connections to external actors</td>
</tr>
<tr>
<td></td>
<td>- Exciting and authentic learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>- Pursuit of external non-standard, interactive learning environments</td>
<td>- University labs</td>
<td>- Parent presentations and career days</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Science Center</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Observatory</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Public Library</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Operation/ Function</th>
<th>Community/ Context/ Reach</th>
<th>Time/ Dynamic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Current Factors</strong></td>
<td>- Restricted function</td>
<td>- Many potential local resources</td>
</tr>
<tr>
<td><strong>Goals</strong></td>
<td>- Long term, hands-on learning</td>
<td>- Engagement with local resources</td>
</tr>
<tr>
<td><strong>Methods</strong></td>
<td>- Multi-phase external experiences</td>
<td>- Parent partnerships</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Potential fundraisers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- University and institution partnerships</td>
</tr>
</tbody>
</table>

**Mental/Ideal**

The major goals from this perspective were an interdisciplinary and hands-on learning environment authentic to the local context. Concepts for the lesson plan ranged from astronomy to robotics to physics. Interdisciplinarity is authentic to current best practices as a method and using local resources grounds the concepts to be learned in realistic and useful ways. Both in the classroom and out, the mentality is experimental and active. This group was not daunted in the least by the issues given in their prompt, but set out to solve them with a cheerful and pragmatic outlook. This outlook is seen in the scope and attention to detail in the plan. Overall, the plan supports the enthusiastic, inquiring minds of the students and supplements the lack of resources in the immediate learning environment.
Physical/Architectural

This plan made use of five different learning environments: a standard classroom, the robotics lab at Oulu University, and the Oulu Science Center, Public Library, and Observatory. The architectural impact of each of these learning environments can be seen in Figure 41. There is not a lot of focus on the static physical/architectural elements of each location, but instead on the atmosphere and resources offered by each. The external environments offer hands-on activities across science and math concepts. Meanwhile, the classroom serves as a home base and point of contact for community members and the resources they offer, such as fundraisers, career days, and salvaged materials for experiments. Overall, this plan offers a wide range of physical/architectural types for students to explore and learn.

![Figure 41. Prompt Three External Learning Environments](image)

Users/Roles

A truly wide range of users were also included in this plan. Parents, university students and faculty, and the staff of the other educational institutions were all engaged to support an active and meaningful set of learning experiences for the students. Students were also given the
responsibility of recruiting some of these partners and challenged with bringing experimental materials from home. There was even some discussion of forming fundraisers to fill the pressing needs of the under-resourced immediate learning environment. Overall, the plan was well-served by a variety of actors and roles for the students and teachers to play.

Operation/Function

The operation/function of the learning environment facilitation plan is structured around taking advantage of external resources and bringing the external learning back to the immediate learning environment in creative and constructive ways. The operational culture is multi-phased, student-centered, and interdisciplinary. The plan allows students to create and explore, but also values expert knowledge. Overall, the operational culture is well-structured to support meaningful, long term learning.

Community/Context/Reach

As discussed in the Users/Roles section, the plan makes use of a fantastic amount of community-based resources. Even more importantly, the planners sought to create partnerships, not just recruit single-use visitors. One of the participants was particularly excited about “cooperation with students of science and physics”. The career day and pertinent parent presentations also followed up on partnerships closer to home. Overall, the plan offers a variety of supportive, long-term community relationships.

Time/Dynamic

This plan covers the most dimensional time of the four, as well as the most learning environments to be engaged. The exact timing of events was not specified, but the structure of internal and external learning offers the students a myriad of important and interdependent contextual experiences. A partnership with the University also allows students to engage with cutting-edge research and concepts. Overall, the plan is extensive, longitudinal, and supportive of modern content.

The focus of this facilitation plan was to utilize community resources to make up for a lack of resources in the immediate and extended learning environment. Four external learning environments were chosen to supplement the immediate learning environment. Each of these partnerships, as well as the more immediate parent partnerships, support the multi-phase,
interdisciplinary math and science program. The major challenges of this prompt centered on a lack of resources in the immediate and extended learning environment. The group answered that challenge thoroughly and gave additional dimensions of authenticity and practical applicability of learning by fulfilling the Characteristics of Community and Emerging Contexts. In the next section, the facilitation plan rubric will be unpacked and discussed as a potential facilitation tool, both for planning new learning environments and developing existing ones. This will lead into the concluding discussion of the future potential and applications of the overall training process.

6.5 Facilitation Plan Rubric

<table>
<thead>
<tr>
<th>Table 12. Extended Facilitation Plan Rubric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mental/Ideal</td>
</tr>
<tr>
<td>Individual</td>
</tr>
<tr>
<td>Group</td>
</tr>
<tr>
<td>Community</td>
</tr>
<tr>
<td>Regional</td>
</tr>
<tr>
<td>Global</td>
</tr>
<tr>
<td>Goals</td>
</tr>
<tr>
<td>Methods</td>
</tr>
<tr>
<td>Impact</td>
</tr>
<tr>
<td>Potential Changes</td>
</tr>
<tr>
<td>Impact</td>
</tr>
<tr>
<td>Potential Changes</td>
</tr>
</tbody>
</table>
As seen in Table 12 and previously in the In-Training Application Plan Rubric, there is potential to expand the rubric to include changes and follow-ups to Learning Environment Facilitation Plans after implementation. When taken with the full range of each of the Six Perspectives, this ability to expand lays the foundation for a transactional realist and pragmatic goal-oriented approach to facilitating learning environments (Figure 42).

![Figure 42. Construction of the Rubric Tool](image)

The rubric has been presented so far with the factors clearly delineated, but as previously discussed, the distinctions are by no means sharply defined. This is shown in Figure 43, where the separating line between Perspectives is removed. However, I offer the intent of the rubric as a tool with much greater flexibility. This same idea was discussed with the Six Perspectives for Approaching the Facilitation of the Holistic Learning Environment. The rubric is an initiating tool meant to aid in organizing thought and action, as well as insuring as holistic a range as possible of factors to be considered. The format and application of the tool have any number of
potential formulations and applications, especially if engaged with different theoretical constructs and across specific contexts. Hopefully, the use of the rubric in the previous section as both a tool for analysis and dissemination offers some practical examples. A helpful activity might be to also explore the non-explicit concepts and overlaps in the four given plans, as well as potential opportunities for improvement or even application to the personal context of the reader. In the next section, the “Potential Changes” row of the In-Training Rubric and some of the deeper motivations for those changes will be discussed.

<table>
<thead>
<tr>
<th>Methods</th>
<th>Function/Operation</th>
<th>Community/Context/Reach</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Pursuit of external non-standard, interactive learning environments</td>
<td>- University labs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Science Center</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Observatory</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Public Library</td>
<td></td>
</tr>
</tbody>
</table>

Figure 43. Merged Cells (Excerpt from Table 7)
7. CONCLUSIONS: REFLECTIONS ON THE CASE STUDY PROCESS

The needs and expectations of current learning environments are changing rapidly and there is a gap in research to clarify and meet those emerging needs and expectations. This thesis situates the process of understanding and facilitating good learning environments in authentic, dynamic, emerging contexts and offers a holistic approach to engaging those contexts. The Six Perspectives for Approaching the Facilitation of the Holistic Learning Environment, Characteristics of a Good Learning Environment, and explication of a case study teacher training that implements the previous two offer a wealth of resources for interested parties to engage with the learning environment as an ideal and a practice. The use of a pragmatic approach demanded these practically applicable results and offered a structural logic for exploring the learning environment from a range of perspectives and scales. An interactive constructivist pedagogy encouraged collaboration and co-creation of this knowledge throughout the case study process and a holistic design approach helped uncover previously obscured aspects of the topic, as well as emphasizing their importance in the learning process. The following sections will discuss value and quality in the research in terms of the preliminary conclusions seen from the literature review and analysis sections, as well as the overall fulfillment of the research questions and goals. This is followed by more specific conclusions pertaining to reflections on the case study training process, additions to the theory suggested by the data from the training, and finally, possible ways forward for the research.

In terms of value and quality in the research, Golafshani (2003) recontextualized the normative ideals of quality in research in a way that helped organize my specific pursuit of quality in the thesis. Rather than “validity” and “reliability” in research, he offers “trustworthiness”, “rigor”, and “applicability” (pp.600-601). Trustworthiness is achieved through clear explication of the researcher’s contextual position in the research process, rigor through regular, informed, and critical evaluation and adjustment of the research process, and applicability through commitment to authentic, contextual theories, materials, and methods (Golafshani, 2003). Hopefully, the attention to these ideals has been clear in the thesis, especially as they closely relate with the overarching precepts of good pragmatic research (Biesta, 2003). Trustworthiness can be seen most in the deep theoretical reconciliation, rigor in the recursive development of the thesis and the case study, and applicability in the accessible format and contextual relevance of
the materials offered by the thesis. In terms of analysis, findings, and conclusions, Golafshani (2003) also puts forward the idea of triangulation: “‘a validity procedure where researchers search for convergence among multiple and different sources of information to form themes or categories in a study’ (Creswell & Miller, 2000, p. 126)”. This idea informed the pursuit of a wide and deep literature review, as well as a multi-modal data gathering and multi-perspective analytic approach. These overlapping methods lead to the Characteristics of a Good Learning Environment, more immediate conclusions from the literature review, as well as the evaluation of the Learning Environment Facilitation Plans, initial conclusions for the case study process. These preliminary conclusions are another example of rigor through the recursive development of the thesis, as their implications were considered in each following step of the process. Both are also accessible and applicable for educators in the macro-context. Trustworthiness, rigor, and applicability can also be seen in the clear connections between the research questions and goals and the process and methods of the thesis.

Table 13. Fulfillment of the Research Questions and Goals

<table>
<thead>
<tr>
<th>Addressed By</th>
<th>Addressed By</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RQ 1</strong></td>
<td><strong>RG 1</strong></td>
</tr>
<tr>
<td>- Initial Findings: Characteristics of a Good Learning Environment</td>
<td>- Thick Literature Review</td>
</tr>
<tr>
<td>- Thick Literature Review and Examples</td>
<td>- Six Perspectives Framework</td>
</tr>
<tr>
<td></td>
<td>- Four Example Learning Environment Facilitation Plans</td>
</tr>
<tr>
<td><strong>RQ 2</strong></td>
<td><strong>RG 2</strong></td>
</tr>
<tr>
<td>- Theoretical Reconciliation</td>
<td>- Interdisciplinary Process and Methods</td>
</tr>
<tr>
<td>- Architecture: Six Perspectives for Approaching the Facilitation of Holistic Learning Environments</td>
<td>- Thick Literature Review</td>
</tr>
<tr>
<td>- Education: Teacher Training Development and Implementation</td>
<td>- Example of a Teacher Training Development and Implementation</td>
</tr>
<tr>
<td><strong>RQ 3</strong></td>
<td><strong>RG 3</strong></td>
</tr>
<tr>
<td>- Case Study Method</td>
<td>- Thesis Materials and Presentation Structure</td>
</tr>
<tr>
<td>- Analysis and Tools (rubric)</td>
<td>- Teacher Training Implemented</td>
</tr>
<tr>
<td>- Thick Description of the Thesis Process</td>
<td></td>
</tr>
<tr>
<td>- Examples of Practical Application from all Perspectives and Scales</td>
<td></td>
</tr>
</tbody>
</table>
Each of the research questions and goals were addressed in a variety of ways; Table 13 shows an overview. The primary answer to the first research question is that a good learning environment is a holistically and recursively developed place which supports learning contextually. The Characteristics of a Good Learning Environment from Section 4.3 hold for the generic macro-context, but the well-supported, personal contextualization of those themes is equally important. The extensive development of the theoretical structure shows a contextually relevant example of the answer to the second research question. Deep engagement with relevant theories and their paradigmatic parts is crucial to an effective interdisciplinary practice. The goal of facilitating good learning environments acts as a cornerstone to this process. In the thesis context, the third research question is answered through the holistic design theory of architecture and the interactive constructivism of education, which came together to produce both a framework for approaching the facilitation of learning environments and a teacher training to apply that framework. The thesis and its subsequent methods and examples also stand as an in-depth, valuable resource for those interested in the ideals and practices of the learning environment, such as the analytical rubric tool. However, the overall increase in teacher agency during the case study was not overly significant. This finding and subsequent conclusions will be discussed in detail in the next few paragraphs.

Many of the issues with the case study process were discussed previously: lack of participant motivation and engagement which led to minimal feedback from participants, underestimation of the barrier of participants using a second language, and gaps between the interactive constructivist educational theory and the practice of that theory during the sessions. These issues and their subsequent effects were disappointing, but the amount and variety of data gathered during the process has massive potential both for the implications of the thesis on the larger discussion of the learning environment and for later research and practices for the author. Also, the four learning environment facilitation plans were thorough examples of the application of the reconciled theoretical structure and process of the thesis. In terms of the larger discussion surrounding learning environments, more research and accessible materials are needed for both the facilitation of and standards for current learning environments. In turn, teachers and teacher trainees need current and accessible materials when approaching the facilitation of their personal learning environments. The materials and process of the case study training meet both of those criteria, but lacked a deeply co-creative phase which lowered the impact and value of the training
for the TAIKA group. As seen in Table 14, the theoretical structure and analytical method offered a clear framework for holistically approaching the issues seen in the case study. The major change for more success in the process would have been to take concrete steps to increase participant voice in the training, such as prior meetings with potential participant groups to ascertain interest, more time and focus on participant comfort and voice at the beginning of the process, and a deeper investigation into participant backgrounds and expectations. A pre-collaborative session before the knowledge session would have also been helpful. Pre-interviews were intended, but no volunteers were willing or available. Much of the pre-planning was done with the professor for the class, but this seemed not to have made a large difference in student motivation and interest.

The participants in general strongly agreed with the concepts of the training, but were unconvinced whether the time spent in the training was worthwhile for them. Therefore, the question has to be asked: does teacher training fill the gap in teacher knowledge and skills as shown in the literature reviewed, or do we have to find new ways to teach and learn about the learning environment? The scope of this thesis has no definitive answer, but the Finnish and group contexts most likely played a large role in the disillusionment of the participants. The students were mostly in their semi-final and final years of an extensive teacher education program, during which they had undertaken similar activities as were given in the training. Most had also already completed placements in schools. This level of pre-existing experience was not planned for in the development of the training. Again, deeper pre-engagement with these contexts and the participants themselves would have resulted in a more relevant training. Further research will have to be pursued to ascertain whether teacher training as a general phenomenon is the best way to support educators in the facilitation of good learning environments in the future.
Table 14. Potential Solutions for the Teacher Training (Excerpt from Table 7)

<table>
<thead>
<tr>
<th>Impact</th>
<th>Mental/ Ideal</th>
<th>Architectural/ Physical</th>
<th>Users/ Roles</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Happier, calmer, more communicative participants</td>
<td>- Higher light and sound comfort</td>
<td>- Strong start on relationships</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Versatile use of space and furnishings</td>
<td>- Unfulfilled potential of learner agency and connections with facilitators</td>
</tr>
<tr>
<td>Potential Changes</td>
<td>- More focus on getting to know one another from the beginning</td>
<td>- Using a different classroom</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Making sure the learning environment is comfortable from the eyes of the student</td>
<td>- Trading out furniture</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>- Checking student comfort immediately</td>
<td></td>
</tr>
<tr>
<td>Operation/ Function</td>
<td>Operation/ Function</td>
<td>Community/ Context/ Reach</td>
<td>Time/ Dynamic</td>
</tr>
<tr>
<td>Impact</td>
<td>- Smooth transitions between phases</td>
<td>- Participant led</td>
<td>- Well-structured and active</td>
</tr>
<tr>
<td></td>
<td>- Some learner agency</td>
<td>- Solely the participants’ responsibility</td>
<td>- Tension of time limit and availabilities</td>
</tr>
<tr>
<td>Potential Changes</td>
<td>- Deeper inclusion of the group leader</td>
<td>- Deeper initial understanding of the context</td>
<td>- Regular check back sessions to keep everyone on the same page</td>
</tr>
<tr>
<td></td>
<td>- Find a contextual medium for student leadership</td>
<td>- More effective second language environment and methods</td>
<td>- Longer sessions cleared ahead of time with the largest possible range of participant schedules</td>
</tr>
</tbody>
</table>

The first addition to the initial theories used in the study is an extension of the previous section’s discussion and would be best supported by a recommitment to the precepts of pragmatic research. As discussed in the previous section, reactions to the Six Perspectives and Good Characteristics were positive, but not to the approach and methods of the training. Practical and successful implementation of the findings of research, as expected by the pragmatic approach, would have fulfilled both of these criteria. The question asked at the end of the previous section requires a deeper critical evolution of the role of the researcher as knowledge creator than was committed to prior to the training. Positive advances can only be made when all actors are engaged and motivated. How can the researcher situate themselves to support the facilitation of this change? Many possible solutions for the context of this case study are seen in Table 14. The main theme is to find what is worthwhile and most effective for the learner-participant and to
recursively engage with those themes in the learning environment. This is supported by the interactive constructivist perspective, as well as deepened by the holistic design approach. Therefore, the addition to the reconciled theory is one of scale. The meta-purpose of the research needs to be fulfilled through strict attention to the immediate needs of participants, rather than to fulfillment of the purpose as an independent factor. This addition can be seen in Figure 44 and has also been applied to the organizational structure of the thesis to support accessibility for readers.

![Image of a diagram](image)

**Figure 44. Addition to the Theoretical Structure**

The second major addition comes in the form of a practical discussion only lightly touched on during the initial research: “money”. Of the few participants who gave feedback to the training session, the majority mentioned the restriction of funding in some way. In the aim to be as widely applicable as possible, the initial materials fell short by not explicitly discussing the issue of resources as affected by the financial aspect of the learning environment. Upon reflection, the majority of the resources reviewed also shied away from a direct discussion of this
perspective of the learning environment. Taylor and Enggass (2009), however, offer some direct insights and inspiration:

This is an idealistic book that asks architects, educators, and parents to aim high and set new priorities. It is a book about entertaining possibilities, suspending disbelief and cynical thinking, and overcoming apathy and perceived barriers to high-quality educational environments. It is about choosing the path of creativity, generosity, and caring over that of distrust, fear, or destructiveness. An intelligently designed, attractive, ecologically responsive learning environment is not a waste of taxpayer money or an unrealistic dream, but rather a vital, concrete endorsement of our better nature and our professed concern for children and the future of the world. (p.4)

Unfortunately, many architectural programs or plans for public school facilities begin with predetermined needs and minimal technical requirements such as square footage or standardized educational specifications. Programs can easily bog down with budgets or value engineering before achieving higher-order values such as support of curriculum, enduring usefulness, beauty, or sustainability. How do we create excellence and optimize tax dollars? In my work as motivator, educator, and programming consultant, I begin the planning process for any learning environment with best practices in education so that every consequent design decision is informed by a vision of academic excellence. Similarly, I also stress the best architecture has to offer so that educators and administrators can begin to appreciate the physical learning environment as a rich resource for learning. I try to provide stakeholders in the different professions alternative thought processes that lead to new solutions about learning environments. I believe success is linked to how clearly and explicitly one can define ambitious academic and aesthetic goals early in the process. The economic bottom line is important, but it is just that: the bottom. (p.5)

Resourcing/Funding would meet the criteria to join the initial perspectives of approaching the learning environment: interdependent with the other perspectives, individual to global effects, and affective of learning environment quality. Figure 45 shows examples that might fall under this aspect. The implications of this oversight in the current literature, whether intentional or not, will definitely be an important part of continuing research into the learning environment.
As well as critically evolving the ideal of the learning environment, I hope to continue implementing research projects that practically apply emerging contexts to practice. In the Spring of 2017, there is potential to work on a comparative study with Markku Lang, exploring various teacher trainings on the learning environment that he has given, as well as the case from this thesis. The following Spring, there is a possible opportunity to implement a variation of the training with a group of Architecture students in the USA during a long term school design competition as part of their studio. The potential findings of this case would be developed in a paper with Elizabeth Grant, a tenured professor at Virginia Polytechnic Institute and State University and studio professor for the group. Other possible venues of interest include delving into variations of the teaching role in the learning environment, such as co-teaching, which is popular in Finland, and short-term or substitute teaching, which is a growing demographic of teachers in the meta-context of the thesis. Overall, this thesis has laid a strong foundation for continuing and meaningful research into the contexts, ideal, and practices of the learning environment. Hopefully this applies for readers as much as the author.
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List of Figures

Figure 1. Reconciling Roles through Common Goals.


Figure 9. Transactional realism: Act, experience, reflect, learn.

Figure 10. Reconciled theoretical Structure.


Figure 12. Six perspectives for approaching the holistic learning environment.

Figure 13. Scales of the learning environment.

Figure 14. Examples from the mental/ideal perspective at each scale.


Figure 17. Examples from the physical/architectural perspective at each scale.


Figure 20. Examples from the users/roles perspective at each scale.

Perspectives from Finland – Towards New Learning Environments (63-77).


Figure 23. Examples from the functional/operational perspectives at each scale.


Figure 25. Dovey, K., & Fisher, K. (2014). Diagrammatic tool for developing learning environments that support the operational culture. In Designing for adaptation: The school as socio-spatial assemblage. The Journal of Architecture, 19(1), 43-63. DOI:10.1080/13602365.2014.882376

Figure 26. Examples from the community/context/reach perspective at each scale.


Figure 30. Examples from the time/dynamic perspective at each scale.


Figure 33. Facilitation plan for second training session.

Figure 34. In-Training application physical/architectural diagram.

Figure 35. Session schedule as posted.

Figure 36. Landmark map drawn by group one.
Figure 37. Prompt one botanical gardens map.

Figure 38. Orienteering roleplay.

Figure 39. Prompt two classroom plan.

Figure 40. Coding classroom mock-up.

Figure 41. Prompt three external learning environments.

Figure 42. Construction of the rubric tool.

Figure 43. Merged cells (Excerpt from Table 7).

Figure 44. Addition to the theoretical structure.

Figure 45. Examples from the resourcing/funding perspective at each scale.
List of Tables

Table 1. Case Study Method and Research Goals


Table 5. Overview of training sessions.

Table 6. Prompts and materials for the four learning environment facilitation plans.

Table 7. In-Training application facilitation plan rubric.

Table 8. Prompt number one facilitation plan rubric.

Table 9. Interdisciplinary orienteering tasks.

Table 10. Prompt number two facilitation plan rubric.

Table 11. Prompt three facilitation plan rubric.
Table 12. Extended facilitation plan rubric.

Table 13. Fulfillment of the research questions and goals.

Table 14. Potential solutions for the teacher training (Excerpt from Table 7).
APPENDICES

Appendix 1 - Pre-Case Materials

Initial Roles and Goals Diagram

Central Overlaps:
- transactional realism/pragmatism
- Social constructivism for learning processes
- Potential of collaboration among all actors
- Subjectivity of what is "good"
- Global ideals through time; semi-mysterious and often silently irrational
- Why there is a need for training and deep contextual understandings
- Learning Environment
- Ubiquity of the terms and their impact on life

• Research
  • Meta theory and method
  • Context
  • Understanding/explicating role -> actionable results
  • My approach: pragmatic understanding, authentically undertaken problem-solving, underlying human rights focus always
  • Value of data/knowledge emphasized

• Education
  • Democracy/agency
  • Place
  • Skills for interpretation and representation -> process/intangibility
  • My approach: collaborative, but facilitated (equal roles), balancing interest and content (expected/valuable to me), exploration and authentic experience ethic
  • "Social knowledge", standardization/understanding others emphasized

• Architecture
  • Fundamental truths: beauty
  • Space
  • Interpretive/representative role -> results/tangibility
  • My approach: contextual, user collaboration balanced with "my vision", problem-solving ethic
  • Individual expression/understanding self emphasized

• Transactional Realism
  • Architecture will be understood as a place-making process that either can support or hinder learning

• Interactive Constructivism
  • Learning Environments

• Mind-matter holism, refusal of separation
• Reflexive relationships with humans
• Often predicated on visual interactions over any other sensation
Participant Release Form

Photograph & Video Release Form

I hereby grant permission to the rights of my image, likeness and sound of my voice as recorded on audio or video tape without payment or any other consideration. I understand that my image may be edited, copied, exhibited, published or distributed and waive the right to inspect or approve the finished product wherein my likeness appears. Additionally, I waive any right to royalties or other compensation arising or related to the use of my image or recording. I also understand that this material may be used in diverse educational settings within an unrestricted geographic area.

Photographic, audio or video recordings may be used for the following purposes:
- conference presentations
- educational presentations or courses
- informational presentations
- on-line educational courses
- educational videos

By signing this release I understand this permission signifies that photographic or video recordings of me may be electronically displayed via the Internet or in the public educational setting.

I will be consulted about the use of the photographs or video recording for any purpose other than those listed above.

There is no time limit on the validity of this release nor is there any geographic limitation on where these materials may be distributed.

This release applies to photographic, audio or video recordings collected as part of the sessions listed on this document only:
- Teacher Training Session 1
- Teacher Training Session 2
- Teacher Training Session 3
- Any supplemental interviews regarding the training sessions

By signing this form I acknowledge that I have completely read and fully understand the above release and agree to be bound thereby. I hereby release any and all claims against any person or organization utilizing this material for educational purposes.

Full Name___________________________________________________
Street Address/P.O. Box________________________________________
City ________________________________________________________
Prov/Postal Code/Zip Code_____________________________________
Phone ___________________________ Fax _______________________
Email Address_________________________________________________
Signature____________________________ Date_______________________
Planning Excerpts from Field Book

- "Learning landscape" vs. ICT
- Appropriate site
- "PLAYCEL" book
- "Think and Talk" (1st session)
- TASK: gather scenarios, learning activities/story for learning design
- helical/ribbon/very high level
- "helicopter"/expert view
- Ability to evaluate level
- Send Guide/PlayScenar
- Photos of people
- Session 1: incorporate what is needed?
- Core curriculum: focus on the future.
- What are your classrooms like?

---

Thesis Seminar:
6-9-18

ZPD Learning Environment - Demographics - Requirements - Discussion - Give Grade Reading

- Perspectives in narratives
- Prompts (Art Education-based)
- Talk to Matt about the background and program of students
- Student-led > small groups
- Project-based
- This is the space; what do you do?
- 3 hr Present
- Main concepts in Finnish, usual!
- NB's: interviews informal get-together after

---

FACILITATING GOOD LEARNING ENVIRONMENTS:
KNOWLEDGE
Rachel Pampel

Resources: Slides with note space
- markers, scissors, etc. for notebooks

Points:
- "What I am: what is the research?" - Thank you for participating!
- "What is the theory?" - Thank you for joining agency.
- Connecting to CC frameworks: next actions possible
SCHEDULE

Introducing the Learning Environment
Presenting the Mini-Projects

POINTS:
- Plan (long short)
- Small amount of time, so I will move things along at a normal pace.

RESOURCES:
- Slides
- Pedagogical approach
- Course schedule, etc.

ENGLISH LANGUAGE

- I really appreciate you working with me in English!
- To best support you and the research:
  - Main topics will also be shared in Finnish.
  - I am happy for questions or being asked to slow down.
  - You can be here if you are struggling.

POINTS:
- English is a complication
- It gets very confusing to answer.
- It's okay to ask questions when you want.

RESOURCES:
- Slides
- Notebooks

THE LEARNING ENVIRONMENT

Is it a dialogue? (Small Talk)
Is it pedagogically versatile and flexible while that offers possibilities?
Is it made up of:
- Learner and their surroundings
- Teacher and learning resources

POINTS:
- My research findings
- Core curriculum statement
- How does it match up to our discussion?

RESOURCES:
- Slides
- Notebooks

THE LEARNING ENVIRONMENT

How does it affect the learning process?
How can you test the learning environment for the best learning?

POINTS:
- Discuss with neighbors
- Work in notebooks

RESOURCES:
- Slides
- Notebooks

NOTEBOOKS

- Please fill out as we go.
- Flexible! You can:
  - Draw - Quote - Color - Cut & paste
  - Anything

POINTS:
- These are the crucial data for my research.
- Core reflection and development tool.

RESOURCES:
- Notebooks
- Semi-structured prompts

THE LEARNING ENVIRONMENT

- What is it?
- What are its parts?

POINTS:
- Lead discussion of the two questions
  - Keep it in real time.
  - Ask them to draw for second

RESOURCES:
- Slides
- Notebooks

APPROACHING THE LEARNING ENVIRONMENT

The Six Perspectives

POINTS:
- Overview of perspectives
- Not complete or linear.
  - Not a question of how to approach the learning environment.

RESOURCES:
- Slides
- Notebooks

THE SIX PERSPECTIVES

Mental/Intellect ( PHYSICAL ARCHITECTURAL )

POINTS:
- Main themes of each level
- Any others you can think of?
  - Is or especially important?
THE SIX PERSPECTIVES

POINTS: - main themes
- any others you can think of?
- or ones that are especially important to you?

RESOURCES: - notebooks - slides

THE SIX PERSPECTIVES

POINTS: - main themes
- any others you can think of?
- or ones that are especially important?

RESOURCES: - notebooks - slides

FREE CONVERSATION

Questions?

POINTS: - free talk for 30m
- leader reflection

RESOURCES: - slides - field notebook

NEXT SESSION

To prepare:
- good L6 goals
- core curriculum reading
- reflections in notebook
- any further thoughts on facilitation of the room?

POINTS: - making this authentic and applicable
- CC 3, 2, 5, 1, 7, 8, 9

RESOURCES: - slides - notebook - CC handout
Session 1

1. Project Prompt
   - Using the core curriculum values and key takeaways, facilitation of the learning environment.
   - Deliberations: visual presentation of plans, collaborative work.

2. Points:
   - Divide groups by:
     - Intro project + availability of guidance
     - Explain deliverables + personal growth focuses

RESOURCES:

Session 1 Reflections
- 30 min. start - forgot to start video
- Lots of interest
- Mini-application definitely helps next session
- Couple stayed and had good thoughts
- HARD to get class ready quickly
- Best good teaching through doing

Prompts
- Extreme behaviors (single/video class)
- Co-teaching/cross-subject
- Crowding
- Very young/autistic
- Food resources
- Non-standard LE

Voices vs. text on presentations
Appendix 2 - Development of the Training Materials

Perspective Example Sketches
**Knowledge Session Slides**

**Learning Goals**

**AGENDA**
- To facilitate the construction of effective learning environments
- To integrate and apply pedagogical and the National Core Curriculum
- To facilitate the development of learning environments that support the learning process
- To scaffold the critical evaluation of the ideal and practical aspects of the learning environment

**COLLABORATION**
- For collective knowledge construction of the learning environment
- To engage with other educators to understand the learning environment
- To innovate new methods of facilitation together
- To share our exploration of other educational through the research process

**Timeline**

**Notebooks**

- **PLEASE FILL OUT AS WE GO!**
  - The notebooks are flexible
  - Draw - write - color - cut and paste - anything!
  - Please use English as much as possible.
  - Focus on showing your process and learning.
  - The notebooks will be collected at the end and returned in February.
  - Remember your number!

**English Language**

**Appreciation**
- Thank you!
- For being willing to communicate in English
- For playing an important part in my research

**Support**
- To best support you in the training:
  - Main topic is also shown in English
  - I am not scary! Please let me know when to slow down or repeat or whatever you need.
  - Tips will be here and happy to help, as always.

**The Learning Environment**

**What is it?**

**What are its parts?**
MINI APPLICATION

**PROMPT:**
Next Lessons:
- practical application session
- four groups, 4-5 members
- Instructional objectives, activity planning, and project deliverables sessions

**MISALIGNED SPACE:**
- 6 groups, 3 persons each, one perspective per group
- Collaborative
- 15 minutes planning, 5 minutes implementation, 10 minutes discussion

MINI REFLECTION

What aspects of the learning environment were most challenging in your teaching life?

Using the six perspectives, fill out the handout with a possible challenging situation from your future.

NEXT SESSION PREPARATION

**TO PREPARE:**
- core curriculum review
- sections 3-5 and 7-9
- In 1st link: http://www.cpsl.org/11246/objekt_ju/objekt/courses/46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-_46-
LEARNING GOALS

APPLICATION (Knowledge)
- Practicing facilitation of a learning environment
- Understanding your process when facilitating the learning environment
- To add to the knowledge of how to approach a learning environment

COLLABORATION (Skills)
- To facilitate a challenging learning environment
- Implementing multiple viewpoints
- To innovate new methods of facilitation together
- To understand the needs and expectations of all users of the learning environment

THE LEARNING ENVIRONMENT

From my research, a dialogue (transcendental) of the fields of vision, charged with the potential for development—(Falkenberg-Stolte, 2008, p.148)

From the Core Curricula: "Facility, locations, communities, and operating practices where learning takes place" that must support the growth, learning, and interaction of the individual and the community—(P1PPER, 2014, p.10)

APPROACHING THE LEARNING ENVIRONMENT

THE SIX PERSPECTIVES (HARRISSON)
- Sensory (Sensory)
- Intellectual (Intelect)
- Physical and Architectural (Facilitating)
- Emotional (Emotional)
- Social and Cultural (Community/Context/Reach)
- Temporal (Temporal)

LEARNING GOALS

MISSION OF EDUCATION (LEU):
- Educational, social, cultural, future related tasks

NATIONAL GOALS (NL):
- Growth as a human being with membership in society
- Development of knowledge and skills
- Promotion of knowledge and ability, equality and lifelong learning

TRANSVERSAL COMPETENCIES (TR):
- TK: Thinking and learning to learn
- T2: Cultural competence, interaction, and self-expression
- T3: Taking care of oneself and managing daily life
- T4: Multiliteracy
- T5: ICT competence
- TB: Working life competence and entrepreneurship
- T7: Participates, motivates and builds a sustainable future
Unused Prompt Number Four

Using the Six Perspectives, Characteristics of a Good Learning Environment, and the Core Curriculum facilitate this possible challenging learning environment for you in the future.

**Your role(s):** Primary Co-Teachers and a Special Needs Teacher

**Students (What are they like?):** 6-7 year olds. Inclusion classroom with four special needs students, two with physical disabilities (wheelchair and hearing impairment), one with multiple learning impairments, and one with autism.

**Number of Students:** 40

**Materials to be Taught (Subject/Topic):** Introductory Lessons in Basic Subjects

**Location (What is it like?):** Newer building that is accessible and supportive. Large classroom with a “quiet” room (soft, acoustically dampened, low lights, and no view to the classroom) that holds 1-2 students and a teacher.

**Resources / Tools Available:** Modern technology and materials. Flexible furnishings and space for all sorts of teaching methods.

**Major Challenge:** Weekly/Daily Schedule for Inclusion and Progress; and Classroom/Operational Cultures

**Anything Else?** (Add details you think are important)

*One group considered this prompt for a short time, but the other two groups rejected the prompt quickly.*
**Notebook Materials**

**Demographic Sheet**

**Demographic Reporting #**
Please fill out each section to the best of your knowledge.

**Age:** ____________

**Sex:** M / F / Other ______________________

**Hometown:**

________________________________________________________

**Native Language:** _______________________________________________________

**Other Languages:** _________________________________________________________

**Previous Experience with Learning about the Learning Environment:**
Never / Some Indirect Learning / Direct Lessons as Part of Another Class /
One Class (3-5 Credits) of Direct Lessons on the Learning Environment /
More than One Class of Direct Lessons on the Learning Environment /
Other _______________________________________________________________

**What are your professional plans after finishing your degree?**

______________________________________________________________

______________________________________________________________

______________________________________________________________

______________________________________________________________

* Very few of these sheets were filled out or even returned.
Instructions for Notebook

#
Hello! This is your notebook in which to record your activities, discussions, and reflections during the Learning Environment Training Sessions. Please do your best to share your process and learning.

**Basic Instructions:**
- Do not use your name in the notebook, only your number.
- Please respond to each prompt below either during or after the session in which they are discussed.
- Number your responses clearly with the prompt you are responding to.
- Response types are completely flexible: write, draw, cut and paste, etc.
- Also feel free to add your own paper/materials.
- Please use English as much as possible, to support the research.

**“Knowledge” Session Prompts:**
1. What are your personal learning goals for this training?
2. A. What is the learning environment? B. What are its parts?
3. How does the learning environment affect the learning process?
4. What methods would you/have you employ(ed) to engage with the learning environment as a part of the learning process?
5. What would you add or emphasize in the learning perspectives?
6. What was new for you in the learning perspectives?
7. Do you have any further ideas for the mini-activity of facilitating our classroom?
8. What do you think are the most challenging aspects of the Learning Environment?

**“Application” Session Prompts:**
10. Please plan the pre-activity using the notebooks materials. Please include your group number on all planning materials.
11. Diagram your pre-activity plan.
12. Please reflect on the pre-activity.
13. Please plan the application activity using the notebook materials. Please include your group number on all planning materials.

14. Diagram your application plan.

15. Please reflect on the application activity.

16. Please reflect on your process and learning from the training so far.

“Reflection” Session Prompts:
17. Please reflect on both your group’s application presentation and the other groups’ presentations.

18. What was the best method you saw? Why? (This does not have to be the whole facilitation plan, just some part/parts.)

19. Please reflect on your process and learning from the whole training.

20. What is your definition of the Learning Environment now as compared to the beginning of the training?

21. What is/are the most important thing(s) you have learned during the training?

22. What would you have liked to spend more time on in the training?

Free response:
23. Is there anything else you would like to share with Rachel in regards to the training methods, process, or results?

Thank you so much for engaging deeply in the training and research process. Your input is valued and important for both the thesis and future teachers.

* Very few of the participants engaged with the prompts or even used the notebook at all.
Audio/Video Release Form

Photograph & Video Release Form

I hereby grant permission to the rights of my image, likeness and sound of my voice as recorded on audio or video tape without payment or any other consideration. I understand that my image may be edited, copied, exhibited, published or distributed and waive the right to inspect or approve the finished product wherein my likeness appears. Additionally, I waive any right to royalties or other compensation arising or related to the use of my image or recording. I also understand that this material may be used in diverse educational settings within an unrestricted geographic area.

Photographic, audio or video recordings may be used for the following purposes:
- conference presentations
- educational presentations or courses
- informational presentations
- on-line educational courses
- educational videos

By signing this release I understand this permission signifies that photographic or video recordings of me may be electronically displayed via the Internet or in the public educational setting.

I will be consulted about the use of the photographs or video recording for any purpose other than those listed above.

There is no time limit on the validity of this release nor is there any geographic limitation on where these materials may be distributed.

This release applies to photographic, audio or video recordings collected as part of the sessions listed on this document only:
- Teacher Training Session 1
- Teacher Training Session 2
- Teacher Training Session 3
- Any supplemental interviews regarding the training sessions

By signing this form I acknowledge that I have completely read and fully understand the above release and agree to be bound thereby. I hereby release any and all claims against any person or organization utilizing this material for educational purposes.

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City ________________________________________________________
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Appendix 3 - Visual Data from the Case Study

Knowledge Session Setup

Application Session Setup
Application Session “Circle”

Presentation Session Setup
Good learning environment

→ Escape the Classroom

Learning environment is everywhere and it can be found anywhere! If the school building or the classroom can’t support learning possibilities enough, search for other alternatives!
After Pros & Cons → Not enough space & resources
= Out from the Classroom :)

public places + easy to access + located nearby/no need to travel far

(no need to...
- pay for expensive group transportation
- make packed lunch
- add more surveillance → extra staff/workforce)

Collaboration with the nearby University:

• Students of Physics and Mathematics
  • Utilizing student’s knowledge and know-how
  • Becoming familiar with the tools used in Physics

• Borrowing/Using tools from the University
  • Robots, models, games and other Mathematic equipment

• Using University’s space
  • Classrooms
  • Hallways
  • Library

Small fundings.
Better to use fundings to go
where the equipment and working
space already are appropriate -
than trying to get them to school with
low budget.

Good equipments, new learning environment,
good practice for university students
fun change for the pupils and teacher.
Going out of the classroom:

**Observatory: (Oulu watertower)**
- Stargazing, star themed math lesson...

**Science center: (Tietomaa)**
- Experiments
- Devices
- Science
- History
- Math club !!!

laws of Physics  
*Space for Projects

Observing the sky

Optional space for teamwork

Integration of subjects

Collaboration with the student’s parents:

- Utilizing the knowledge and careers of the student’s parents and relatives

If the relatives/ family friends have careers or hobbies that are related to subject career introduction and/or demonstration visits are possible (willingly)!