Experiential entrepreneurship education

Reflective thinking as a counterbalance to action for developing entrepreneurial knowledge

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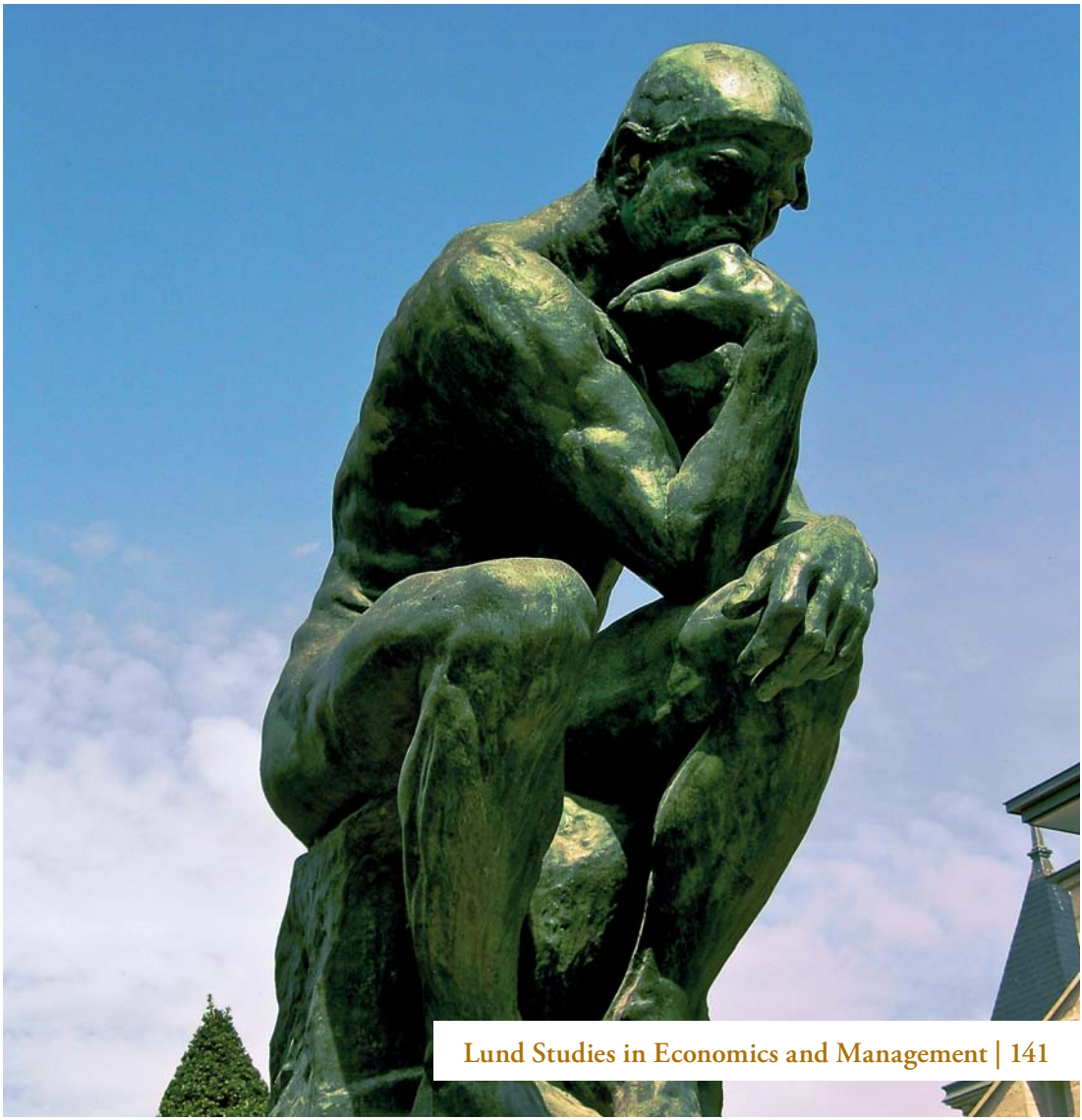
GUSTAV HÄGG | DEPARTMENT OF BUSINESS ADMINISTRATION



Lund Studies in Economics and Management | 141

Experiential entrepreneurship education

Reflective thinking as a counterbalance to action for developing entrepreneurial knowledge

This dissertation has sought to explain the importance of reflective thinking as a counterbalance to the basic assumption of action orientation when educating student entrepreneurs. To achieve this purpose a conceptual framework of the process of entrepreneurial inquiry was developed through the empirical insights gained in the course of the research process. The conceptual framework combines theory on how humans store and develop knowledge from a cognitive perspective with research on how to tailor education based on learning through experience. Together, these two theoretical streams provided a platform for the empirical studies conducted and the findings that emerged. Based on the empirical findings, the development of entrepreneurial knowledge in an educational context is dependent on the stimulation of different types of knowledge including declarative, procedural, and conditional knowledge as well as contextual awareness. In addition, guidance related to the proficiency of the student, and the directional process of entrepreneurial inquiry are important elements for understanding the development of entrepreneurial knowledge in experiential entrepreneurship education. From the empirical studies it has been established that reflective thinking is the means of transforming experience into knowledge. However, the empirical studies also provided insights on how the three pedagogical methods play different roles when student entrepreneurs develop reflective thinking ability, described as a transactive educational process, termed the process of entrepreneurial inquiry.

To conclude this dissertation that has sought to develop, and to some extent challenge, an implicit assumption of action when teaching and learning entrepreneurship, I find it appropriate to relate back to an early dialectic suggested by Dewey, in which he argued, "learn to do by knowing and to know by doing" (McLellan & Dewey, 1889), which in many ways has guided the inquiry in this dissertation.

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Experiential Entrepreneurship Education

Reflective Thinking as a Counterbalance to Action for Developing Entrepreneurial Knowledge

Gustav Hägg

LUND UNIVERSITY

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Abstract

In contemporary society entrepreneurship has been promoted as the key to forming the 21st century citizen. Over the years the accumulation of knowledge and experience of how to teach entrepreneurship has generated a call for a more pragmatic and critical approach due to the low academic legitimacy of the field, where research has been largely descriptive and focused on narrative teaching experiences with a low level of theoretical and methodological grounding based on implicit assumptions on learning. One main problem identified in entrepreneurship education is the strong emphasis on learning through action, which is something that stands in stark contrast to a more traditional view on academic education. To create a prosperous learning process in entrepreneurship education we need a counterbalance to the strong bias toward action orientation. A potential counterbalance addressed in educational literature is reflective thinking, which has been highlighted as important and gained increased attention in the literature on entrepreneurship education.

Despite this recognition, there have been surprisingly few empirical attempts to study how reflective thinking might play a significant role in student entrepreneurs' learning. In addition, we lack a comprehensive understanding of how reflective thinking develops in the entrepreneurship education situation. Hence, it is necessary to understand how reflective thinking ability might serve as a means that enables student entrepreneurs to transform experience into entrepreneurial knowledge.

In this dissertation I have studied three different pedagogical methods, mentorship, peer-learning, and reflective diaries, and by applying these methods I answer the following research questions:

RQ1: How can different pedagogical methods support the development of reflective thinking in experiential entrepreneurship education?

RQ2: Why do these methods develop reflective thinking, and why do they create a balance between action and reflective thinking?

Based on the empirical findings, the development of entrepreneurial knowledge in an educational context is dependent on the stimulation of different types of knowledge including declarative, procedural, and conditional knowledge as well as contextual awareness. In addition, guidance related to the proficiency of the student, and the directional process of entrepreneurial inquiry are important elements for understanding the development of entrepreneurial knowledge in experiential entrepreneurship education. From the empirical studies it has been established that reflective thinking is the means of transforming experience into knowledge. However, the empirical studies also provided insights on how the three pedagogical methods play different roles when student entrepreneurs develop reflective thinking ability, described as a transactive educational process and termed the process of entrepreneurial inquiry.

Key words: reflective thinking, entrepreneurship education, pedagogy, learning, education, experiential learning, action, domain-specific knowledge, cognitive load theory

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MADE IN SWEDEN

To Edvin and Arvid

Memories acti, prudentes futuri

Table of Contents

Foreword and Acknowledgement 9
Abstract 11
List of tables, figures and models 12
1. Introduction 13
1.1 Problem and purpose 13
1.2 Entrepreneurial knowledge 16
1.2.1 A learning taxonomy 16
1.2.2 Defining entrepreneurial knowledge 17
1.3 Educational context 20
1.3.1 Venture creation program at Lund University – the empirical setting 20
1.3.2 Graduate statistics 24
1.4 Structure of the dissertation 25
2. Theoretical framework: A tentative model for understanding the balance between action and reflective thinking in experiential entrepreneurship education 27
2.1 Learning in experiential entrepreneurship education 27
2.2 Experience and its relationship to entrepreneurship and experience-based pedagogy 30
2.3 Experience-based learning theories used in entrepreneurship education 31
2.3.1 Action learning 32
2.3.2 Experiential learning 33
2.3.3 Problem-based learning 34
2.3.4 A synthesized discussion on experience-based learning theories 35
2.3.5 Experiential education and cognitive load theory as a potential theoretical foundation 37
2.4 Experiential education 38
2.4.1 Interplay between different types of knowledge in the learning process 39
2.4.2 Logic of inquiry 40
2.5 Cognitive load theory 41

2.5.1 Worked examples 42
2.5.2 Expertise reversal effect..... 42
2.6 A tentative model for experiential entrepreneurship education..... 43
2.6.1 Primary Entrepreneurial Experience..... 44
2.6.2 Secondary Entrepreneurial experience 45
2.6.3 Synthesis 46
2.6.4 Entrepreneurial knowledge 47
2.6.5 The student entrepreneur 48
2.6.6 The entrepreneurial educational context..... 49
2.7 The interplay of knowledge and the importance of reflective thinking 50
2.8 The influence of the tentative model on the empirical studies 50
3. Research design 53
3.1 Philosophical stance 53
3.1.1 Pragmatism – its meaning..... 53
3.1.2 Pragmatism from a methodological perspective..... 54
3.1.3 How my pragmatic approach affected the individual studies.... 55
3.2 Research process..... 56
3.2.1 Pre PhD journey..... 56
3.2.2 My PhD journey: The studies conducted and the rationale for my decision 57
3.2.3 Evolution of pedagogy in research on entrepreneurship education: Reviewing achievements and addressing challenges..... 59
3.2.4 Formal mentorship in experiential entrepreneurship education: Examining conditions for entrepreneurial learning among students .. 61
3.2.5 Learning from and through each other: A study of peer learning in experiential entrepreneurship education 63
3.2.6 The reflective novice entrepreneur: From habitual action to intelligent action using experience-based pedagogy as a vehicle for change 66
3.2.7 Other studies emanating from the research process..... 68
3.3 Methodological choices: process data and triangulation..... 69
3.4 Methodological considerations regarding the empirical studies 70
3.5 Reflections on the multidisciplinary approach taken in the dissertation 72
3.6 Reflections on duality as a researcher and instructor 72
4. Discussion and contribution of the dissertation..... 75
4.1 The main contribution of the dissertation..... 75
4.1.1 Overview of the four appended studies 75
4.2 Research questions 77

4.2.1 How can different pedagogical methods support the development of reflective thinking in experiential entrepreneurship education? 78
4.2.2 Why do these methods develop reflective thinking, and why do they create a balance between action and reflective thinking? 81
4.3 Explanation and contributions of the modified conceptual framework 84
4.4 Implications for theory 87
4.5 Implications for teaching and learning entrepreneurship 90
4.6 Implications for future research 92
4.7 Conclusion 96
References 97
Appended papers 112
Paper 1 – Evolution of pedagogy in research on entrepreneurship education: Reviewing achievements and addressing challenges 113
Paper 2 – Formal mentorship in experiential entrepreneurship education: examining conditions for entrepreneurial learning among students 153
Paper 3 – Learning from and through each other: A study of peer learning in experiential entrepreneurship education 177
Paper 4 - The reflective novice entrepreneur: From habitual action to intelligent action using experience-based pedagogy as a vehicle for change 205

Foreword and Acknowledgement

Throughout the process of writing this dissertation I have always believed in the greater good of academic research as a means for advancing societies in an unpredictable future. The rigorous process of using logic for understanding how the world is constructed and by logical advancements re-constructed, is what I see as an ethos of pragmatism. In this regard, I feel that my five years have not been in vain, as this period has opened a new door for understanding how to construct teachability and learnability within entrepreneurship education. This five year period also opened the door to closely related fields, such as educational theory for understanding how to advance the domain of entrepreneurship education and for progressing how to teach student entrepreneurs. However, as the full circle of this endeavor is coming to an end it is time to open new doors for future thoughtful inquiries in the world of science and philosophy. The door that I am now closing has generated a foundation. Although I am still far from being an expert in terms of understanding the art and craft of research, the door that I am closing has provided new insights and visions for how to raise my voice as a scholar. To pay tribute to past scholarly accomplishments I turn to the main contribution that inspired this dissertation: "The belief that all genuine education comes about through experience does not mean that all experiences are genuinely or equally educative" (Dewey, 1946).

With reference to the words of Dewey, I must confess that many paths I have stumbled across during this process have been less educative than the main path and I have my supervisors to thank for getting me back on track. But at the same time, these side paths also brought clarity to my chosen path. Finally, I present the main idea guiding the process of this dissertation: *Memories acti*, *prudentes futuri*, be mindful of things done, and be aware of things to come. Closing the door of this chapter of my life does not mean that it is locked and forgotten; only that it merits a fixed position in my past for foreseeing an uncertain future when opening new doors.

Developing an initial idea into a complete dissertation would not have been possible without the support and guidance of a number of persons. First and foremost, I wish to express my gratitude to my supervisors, Associate Professor Diamanto Politis and Professor Hans Landström.

Diamanto, you taught me persistence and your enthusiasm for understanding the process of learning has influenced my development in many ways over the years. In terms of developing an understanding of the multidisciplinary field I am in, you pushed me further than I would have been able to do alone. Together with Hans and Jonas, you taught me about the world of research and the meticulous process that underlies the development and construction of research. I say this with

gratitude, as I know that I am not the easiest person to understand, thus your remarkable perseverance with all my ideas is something that I will never forget. I hope that you have also gained from this process, as my understanding of the field has been greatly advanced through all our discussions over the years - both formal and spontaneous, which also applies to you Hans.

Hans, if there is someone that I should thank when it comes to going to the roots it is you. During the past five years I am grateful for having had you as a guide to past scholarly work and your conviction of knowing the roots and basic assumptions of your research domain has been a highly influential part of my research process. In addition, to my mind you have been continuously supportive, despite not always agreeing on the importance of reflective thinking in the entrepreneurial process.

Throughout my five years of working on this dissertation many persons have been important. Professor Jonas Gabrielsson, my unofficial mentor, who brought me into the world of research. I am forever grateful that you saw my potential when I was writing my thesis and I highly value your continued friendship and support over the years. I also want to thank you, Marie Löwegren, for giving me the opportunity to spend five years on this research. To Associate Professor Agnieszka Kurczewska, I see our joint collaboration over these years and our friendship as a beginning that will continue forever. Additionally, I also wish to express my thanks to all my colleagues over the years at the Sten K Johnson Centre for Entrepreneurship for your support and friendly discussions, as well as colleagues at the School of Economics and Management.

I would also like to express my gratitude to Professor Mats Westerberg who initiated the 'Entrepreneurial learning network' in which I gained many new insights and also friends pursuing research on entrepreneurship education. All network members have in some way or other played a part in the development of this dissertation. I also want to mention the ESU community that has played an important role during my PhD studies, in particular Vera and our discussions and evolving friendship. Furthermore, this dissertation would not be what it is without the input I gained during my dissertation seminars. In this respect, my gratitude goes to my discussants during these seminars, Professor Daniel Örtqvist, Associate Professor Karen Williams Middleton, Associate Professor Per Blenker, Associate Professor Henrik Berglund, and PhD Kåre Moberg.

Finally, I would not have been able to complete this dissertation without the support of my family. Your continuous support and help in life has been invaluable. This dissertation is dedicated to you Caroline, and to our two sons, Edvin and Arvid.

Abstract

In contemporary society entrepreneurship has been promoted as the key to forming the 21st century citizen. Over the years the accumulation of knowledge and experience of how to teach entrepreneurship has generated a call for a more pragmatic and critical approach due to the low academic legitimacy of the field, where research has been largely descriptive and focused on narrative teaching experiences with a low level of theoretical and methodological grounding based on implicit assumptions on learning. One main problem identified in entrepreneurship education is the strong emphasis on learning through action, which is something that stands in stark contrast to a more traditional view on academic education. To create a prosperous learning process in entrepreneurship education we need a counterbalance to the strong bias toward action orientation. A potential counterbalance addressed in educational literature is reflective thinking, which has been highlighted as important and gained increased attention in the literature on entrepreneurship education.

Despite this recognition, there have been surprisingly few empirical attempts to study how reflective thinking might play a significant role in student entrepreneurs' learning. In addition, we lack a comprehensive understanding of how reflective thinking develops in the entrepreneurship education situation. Hence, it is necessary to understand how reflective thinking ability might serve as a means that enables student entrepreneurs to transform experience into entrepreneurial knowledge. In this dissertation I have studied three different pedagogical methods, mentorship, peer-learning, and reflective diaries, and by applying these methods I answer the following research questions:

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List of tables, figures and models

Table 1.1: Learning outcomes of the master program in new venture creation 21
Figure 1.1: Program overview 22
Table 1.2: Graduate statistics..... 24
Table 2.1: Experience-based learning theories and their application in entrepreneurship education 36
Model 2.1: The logic of experiential entrepreneurship education 44
Figure 3.1 Research process 57
Table 3.1. Appended papers..... 58
Table 4.1: Contributions of the appended papers 76
Model 4.1: The process of entrepreneurial inquiry..... 83
Table 4.2: Summary of implications for future research 95

1. Introduction

1.1 Problem and purpose

In contemporary society entrepreneurship has been promoted as the key to forming the 21st century citizen (Commission, 2013). The implementation of entrepreneurship courses and programs (Pittaway & Cope, 2007b) has seen an exponential growth since the 1980s (Katz, 2003), which has been fueled by a political call for a more enterprising culture aimed at bridging the gap between education and the economy (Ball, 1989). During the last 10-15 years the development of entrepreneurship education has expanded rapidly. In a Swedish context, between 2004 and 2008 the number of courses almost doubled (from 159 to 305) and the number of full programs rose from 56 to 88 (HSV, 2009:33). As a result of this expansion, the number of students taking university level entrepreneurship courses in Sweden increased from 13,744 in 2004 to 22,419 in 2008 (HSV, 2009:33). In a recent study by Zaring, Gifford, and McKelvey (2016) it was reported that 37 out of 51 higher education institutes in Sweden offer entrepreneurship in their curricula, where the emphasis is on a mix of theory and practice.

In parallel with this development the scholarly community of entrepreneurship educators has increased significantly from a small group of enthusiastic pioneers to a large group of educators focusing on how to teach entrepreneurship. Over the years the accumulation of knowledge and experience of how to teach entrepreneurship has generated a call for a more pragmatic and critical approach (Fayolle, 2013) due to the low academic legitimacy of the field (Fayolle, Verzat, & Wapshott, 2016), where research has been largely descriptive and focused on narrative teaching experiences with a low level of theoretical and methodological grounding based on implicit assumptions on learning (e.g., Fayolle et al., 2016; Pittaway & Cope, 2007a; Rideout & Gray, 2013).

One main problem identified in entrepreneurship education is the strong emphasis on learning through action, which stands in stark contrast to a more traditional view on academic education (Sweller, 2015a). Entrepreneurship education has in this respect created a strong action oriented focus, where students strive to learn entrepreneurship through engaging in practical learning activities and in conjunction are encouraged to take responsibility for their own learning

process (Gielnik et al., 2015; Rideout & Gray, 2013; Robinson, Neergaard, Tanggaard, & Krueger, 2016). One reason for this action oriented focus in entrepreneurship education could be that the early generation of educators were imprinted by the behavior of actual entrepreneurs and the available knowledge of entrepreneurial behavior (Sexton & Bowman, 1984; Weinrauch, 1984). In addition, educators at that time were influenced by some popular learning frameworks within management, such as action learning (Revans, 1982) and experiential learning theory (Kolb, 1984). Together, these two reasons created a strong focus on learning by doing (Sexton & Bowman-Upton, 1987), and hence the emphasis on implementing action oriented methods for educating student entrepreneurs.

Why is there a problem with having a strong bias toward an action oriented focus in entrepreneurship education? According to educational science and cognitive load theory (Alexander, 1992; Kirschner, Sweller, & Clark, 2006), over emphasizing the influence of action in learning could lead to a decrease in knowledge accumulation among students. From an educational science perspective, the argument is that to grasp a subject-domain like entrepreneurship, different forms of knowledge are needed (Alexander, 1992; Alexander & Judy, 1988), from factual knowledge and skills to an understanding of when and why knowledge should be used (Alexander, 1992). If we place too much emphasis on developing action oriented student entrepreneurs, we might teach them the skills to act, but most likely not provide them with an understanding of when and why the knowledge should be used. In addition, according to cognitive load theory (Paas & Van Merriënboer, 1994; Sweller, 2015b) there is always a risk of placing students in complex practical situations that will have a negative effect on learning due to cognitive overload. Cognitive overload occurs when individuals are placed in a practical learning activity where they have limited prior knowledge of the task, which causes their working memory to become overloaded, thus lowering their ability to solve the problem (Kalyuga, Ayres, Chandler, & Sweller, 2003; Kirschner et al., 2006).

Therefore, one conclusion that can be drawn so far is that to create a prosperous learning process in entrepreneurship education we need a counterbalance to the strong bias toward action orientation. A potential counterbalance addressed in educational literature is reflective thinking (e.g., Boyd & Fales, 1983; Dewey, 1910; Freire, 1970; Jarvis, 1992; Mezirow, 1991). In educational literature (Boyd & Fales, 1983; Kember, 1999; Phan, 2009; Rodgers, 2002), reflective thinking is described as an ability that can be taught, which means that individuals are able to learn how to reflect on a conscious level (Rodgers, 2002). All individuals reflect more or less on an unconscious level (Dewey, 1910), but in order to learn, reflective thinking must be made conscious to enable active and aware decisions about one's learning (Boud, Keogh, & Walker, 1985).

In the literature on entrepreneurship education, reflective thinking has been highlighted as important and gained increased attention (Jack & Anderson, 1999; Lindh & Thorgren, 2016; Neck & Greene, 2011; Williams Middleton & Donnellon, 2014). Building further on the discussion above, based on insights from educational science as well as cognitive load theory, the importance of developing reflective thinking to balance action orientation in entrepreneurship education is related to entrepreneurial behavior (Baron, 1998, 2007), where making decisions on how to proceed in an uncertain future involves an understanding of what is learnt through experience. Therefore, it is important to develop reflective thinking among student entrepreneurs, as it serves as a tool (Dewey, 1938) for understanding the learning experiences gained through action.

Thus, seeing reflective thinking as a counterbalance to action becomes important for furthering the scholarly understanding of how experience leads to the generation of knowledge in an educational setting. The most undeniable argument for this balance, and its importance for entrepreneurs, is found in the writing of Freire (1970), who argued that mere action only leads to activism, and mere reflection only leads to verbalism, and that it is through the interplay of both that we learn through experience and generate knowledge. From an entrepreneurial perspective, Baron (1998, p. 291) argues that "the goal of a cognitive perspective is certainly not that of creating completely rational entrepreneurs who are totally immune to all cognitive errors. What we want, ultimately, is not entrepreneurs who are paralyzed into inaction by efforts to conduct totally logical assessments of all possible risks and benefits, but rather ones who pause and reflect sufficiently to increase the chances that they – and their societies – will prosper".

Despite this recognition, there have been surprisingly few empirical attempts to study how reflective thinking might play a significant role in student entrepreneurs' learning. In addition, we lack a comprehensive understanding of how reflective thinking develops in the entrepreneurship education setting. Finally, we need more knowledge concerning the relationship between action and reflective thinking to generate a learning process suitable for entrepreneurship education. Hence, there is a need to understand how reflective thinking ability might serve as a means that enables student entrepreneurs to transform experience into entrepreneurial knowledge.

In this dissertation I will study three different pedagogical methods, mentorship, peer-learning, and reflective diaries, and by applying these methods I will answer the following research questions:

RQ1: How can different pedagogical methods support the development of reflective thinking in experiential entrepreneurship education?

RQ2: Why do these methods develop reflective thinking, and why do they create a balance between action and reflective thinking?

With this dissertation I will contribute to the scholarly community of entrepreneurship education by: (1) building an understanding of how students

develop knowledge within entrepreneurship education, where my contribution will enhance the field by strengthening its theoretical foundation, especially in relation to the stream of research that focuses on learning through experience in educational settings. (2) As previous research has highlighted experience and action as important ingredients for learning entrepreneurship, I place emphasis on reflective thinking to understand how the combination of different forms of knowledge can facilitate the student entrepreneur's ability to learn through experience. In particular, I contribute by nuancing the duality of experience, both the action and reflective sides of learning, something that has not been fully addressed in previous research on entrepreneurship education (e.g., Hägg & Kurczewska, 2016). The duality of experience is especially evident in relation to how learning is developed through experience, where the duality of the term plays an important role for understanding the need to include both reflective thinking and action as essential elements within an educational environment. (3) Through the different empirical studies I try to nuance and capture how we can understand knowledge development in different pedagogical methods; focusing on reflective thinking from the perspective of the student entrepreneur, through peer-to-peer learning to expert-novice learning, which is further conceptualized in chapter four.

1.2 Entrepreneurial knowledge

1.2.1 A learning taxonomy

For the purpose of this dissertation it is important to discuss the distinction between learning about, for, in, and through entrepreneurship when elaborating on the boundaries of entrepreneurship education. Depending upon the purpose of the education the four distinctions have a different meaning for how entrepreneurship education is organized and what content is included, but also when problematizing the balance between action and reflective thinking.

- Learning about entrepreneurship: focusing on developing content knowledge (Gibb, 1993), often expressed as factual know-what (Alexander, Schallert, & Hare, 1991).
- Learning for entrepreneurship: focusing on preparing student entrepreneurs for a future entrepreneurial career by means of, for example, simulated learning activities mirroring how practicing entrepreneurs act (Pittaway & Cope, 2007b).
- Learning in entrepreneurship: a more affective and practical approach to educating student entrepreneurs that creates a closer fit with how actual

entrepreneurs learn in practice (Cope & Watts, 2000; Gibb, 2002; Johannisson, 1991).

- Learning through entrepreneurship: based on the increased attention to entrepreneurship as pedagogy and the importance of developing entrepreneurial knowledge, skills, and behavior regardless of educational practice (Hoppe, Westerberg, & Leffler, 2017; Jones & Iredale, 2010).

When problematizing the balance between action and reflective thinking in entrepreneurship education, it is firstly of the utmost importance to address education that targets learning for and in entrepreneurship, where action orientation and experiential learning theories have been highly influential when educating student entrepreneurs (Pittaway & Cope, 2007b; Rasmussen & Sørheim, 2006). Although education for and in entrepreneurship by means of venture creation is not a new phenomenon, it is still rare (Lackéus, Lundqvist, & Middleton, 2016; Lackéus & Williams Middleton, 2015). Thus, these so-called venture creation programs need to be further examined, not least for understanding the balance between action and reflective thinking.

1.2.2 Defining entrepreneurial knowledge

To understand the differentiation in knowledge necessary for student entrepreneurs, the OECD report from 1989 is a good reference point. The report is important due to its promotion of developing a global enterprising culture through a policy push and through its distinction between a narrow and a broad approach to entrepreneurship education (Ball, 1989). When considered from a research point of view, two interrelated perspectives have shaped the discourse in the domain of entrepreneurship education (e.g., Gibb, 1993; Jones & Iredale, 2010; Leffler, 2009). One takes a broader perspective on how to develop enterprising individuals, while the other takes a narrower perspective focusing on the start-up process and developing individuals' ability to create and manage new ventures. The OECD report defines the two approaches as follows (Ball, 1989, pp. 6-7):

- "A narrow approach, which regards entrepreneurship as business entrepreneurialism, and sees its promotion and development within education and training systems as an issue of curriculum development, which enables young people to learn, usually on an experiential basis, about business start-up and management."
- "A broad approach, which regards entrepreneurship as a group of qualities and competences that enable individuals, organizations, communities, societies and cultures to be flexible, creative and adaptable in the face of, and as contributors to, rapid social and economic change."

In relation to these two approaches, the present dissertation resides in the narrow approach, which sees entrepreneurship as a domain that has an educational

purpose to educate individuals to become entrepreneurs/entrepreneurial by means of engaging students in learning activities related to business start-up activities (e.g., Jones & Iredale, 2010; Lackéus et al., 2016).

Hence, to grasp this narrow approach to entrepreneurship education, the present dissertation relies to a large extent on Gartner's (1988) view on entrepreneurship as a phenomenon. Firstly, although I am fully aware of the difficulties of defining entrepreneurship as a scholarly phenomenon (Davidsson, 2004), I am inspired by Gartner (1988) and his definition of entrepreneurship as the creation of organizations. Secondly, I fully agree with Gartner (1988) about the need to focus on the behavioral aspects of the entrepreneurial phenomenon.

To understand how entrepreneurship as a phenomenon of organizational creation (Gartner, 1988) could create a foundation for the development of entrepreneurial knowledge in education, I rely on Davidson's (2004) view of the entrepreneurial process as a directional interrelation between a discovery mode and an exploitation mode. The following discussion will address how I view and delimit what entrepreneurial knowledge is related to the phenomenon and the process, and how it focuses on the narrow view of entrepreneurship education.

In relation to the entrepreneurial process, entrepreneurial knowledge has been portrayed in two main ways. The first is from an entrepreneurial learning perspective (e.g., Cope, 2005; Deakins & Freel, 1998; Politis, 2005b) focusing on the entrepreneurial process, while the second is from an educational perspective, where it has been described as different components that constitute entrepreneurial competence (Gibb, 1993; Johannisson, 1991; Ronstadt, 1985).

From an entrepreneurial learning perspective, entrepreneurial knowledge has been equated with knowledge acquired experientially (Cope, 2005; Deakins & Freel, 1998), which in an entrepreneurial setting consists of increased effectiveness in recognizing opportunities, and an increased effectiveness in coping with liabilities of newness (Politis, 2005b). Liabilities of newness occur in the early phase of venture creation when the entrepreneur faces a constellation of problems bound to the entrepreneurial process (Stinchcombe, 1965). These problems include the cost of learning and educating employees in new roles and tasks, the cost of inventing new roles, the reliance on 'social relations among strangers' within the new venture, and the lack of relations with external stakeholders such as customers and suppliers that have to be established. The increased effectiveness in recognizing opportunities and coping with liabilities of newness is in this dissertation seen as the core when addressing entrepreneurial knowledge from a narrow approach. The entrepreneurial learning perspective is complemented by the educational perspective, which recognizes the importance of differentiating between forms of knowing to develop entrepreneurial knowledge (Johannisson, 1991).

From an educational perspective, entrepreneurial knowledge has been broadly discussed in terms of developing entrepreneurial competences, recognized as

important to stimulate in an educational setting (Gibb, 2002; Johannisson, 1991). In an attempt to further distinguish between different types of competence, Johannisson (1991) made a categorization of different forms of knowing comprising: know-why (attitudes, values, and motives), know-how (skills), know-who (social skills, networking), know-when (insights, experience, and intuition), and know-what (encyclopedia knowledge). On the basis of this categorization he argued that entrepreneurship education should seek to stimulate learning from an action perspective and that know-what competences are ranked lowest in terms of their contribution to an entrepreneurial career (Johannisson, 1991, p. 72). It has been argued by, for example, Gibb (1987), Sexton and Bowman-Upton (1987), and Ronstadt (1985), that this view on know-what, also equated with factual knowledge[1] about entrepreneurship, is less important when making early attempts to pursue a more action oriented perspective when teaching entrepreneurship.

The development in entrepreneurship education toward a more action oriented perspective and the move away from factual knowledge is understandable, as scholars in the field aimed to break free from prior conceptions of how to educate (Johannisson, 1991; Ronstadt, 1985; Sexton & Bowman-Upton, 1987; Weinrauch, 1984). However, by altering the focus from delivering factual knowledge (Gibb, 1993; Sexton & Bowman-Upton, 1988) and instead emphasizing the development of entrepreneurial skills, attitudes, and behavior, the field of entrepreneurship education also distanced itself from discussions in mainstream education (Béchard & Grégoire, 2005; Pittaway & Cope, 2007a). This is noticeable when addressing the interrelation between types of knowledge in learning activities, which was discussed in educational science in the late 1980s and early 1990s (Alexander & Judy, 1988; Alexander et al., 1991; Ertmer & Newby, 1996; Sweller, 1988, 1994).

Based on the above discussion, entrepreneurial knowledge is in this dissertation defined as "the knowledge and skills needed when creating a new organization, the knowledge and skills to recognize and act on opportunities, and the judgmental ability of coping with decision-making under uncertain conditions". The definition is tripartite, relating to entrepreneurial learning and entrepreneurship education research, but also to theories addressing how learning is developed through experience, and in relation to different types of knowledge.

Knowledge and skills to cope with the creation of a new organization refer to the various tasks bound to the venture start-up phase (Reynolds, 1997), which are related to the different aspects of the liability of newness (Politis, 2008; Stinchcombe, 1965), and can be associated with the development of factual knowledge and skills. This is termed declarative and procedural knowledge in educational science (Alexander et al., 1991).

[1] In the literature on entrepreneurship education, factual knowledge is often termed content knowledge. For the sake of clarity, I have chosen to use the term factual throughout the dissertation.

Knowledge and skills to recognize and act on opportunities are built on discussions of the importance of prior knowledge, and how prior knowledge creates opportunities to recognize business ideas (Shane, 2000). They are also related to the alertness of the entrepreneur (Kirzner, 1997), as well as to declarative and procedural knowledge in educational science.

Abilities to cope with decision-making under uncertain conditions can be found in previous research discussions on both entrepreneurship education and learning through experience (Dewey, 1910; Johannisson, 1991), for knowing when to act, which is based on gaining entrepreneurial experience and acting intuitively, and motives for knowing why to make decisions on how to act under uncertain conditions. The abilities also connect to entrepreneurial learning, and the development of reflective thinking to engage in higher-level learning to cope with decision-making and uncertainty (Cope, 2003, 2005). In relation to educational science, the abilities are related to the development of conditional knowledge (Alexander et al., 1991), making it possible for a student entrepreneur to regulate acquired entrepreneurial knowledge and skills when engaging in the entrepreneurial process.

To develop entrepreneurial knowledge in experiential entrepreneurship education, learning activities consisting of both action and reflective thinking need to be balanced when tailoring pedagogical methods. In addition, the three types of knowledge (declarative, procedural, and conditional) also need to be considered. The recognition of all three types of knowledge builds on educational science research in which it is argued that they are equally important when developing domain-specific knowledge (Alexander & Judy, 1988). Although single learning activities might focus on one type of knowledge, the overarching learning process should implement learning activities stimulating all three to develop entrepreneurial knowledge (Alexander, 1992).

1.3 Educational context

1.3.1 Venture creation program at Lund University – the empirical setting

The master program in new venture creation at Lund University is a one-year program launched in 2007. The program is an open master, which means that any student with a bachelor degree or higher can apply, regardless of disciplinary background. Since the program was launched in 2007 the interest among priority one applicants has steadily increased. In 2007, 65 students (17 of whom were priority 1 applicants) applied and 26 were enrolled. By 2010 the number of

applicants had increased to 1,345 (of whom 445 were priority 1 applicants). However, the number dropped to 371 in 2011 when a tuition fee for non-EU students was introduced in Sweden and the application deadline was changed, leading to many potential applicants missing the earlier deadline. Since then the number of applicants has once again increased, and in 2017 the number of applicants was 1,301 (of whom 580 were priority 1 applicants). Over the years the average number of enrolled students has been about 30 students per year +/- 5.

Table 1.1: Learning outcomes of the master program in new venture creation

Learning outcome	Description
Knowledge and understanding	- Demonstrate knowledge and understanding of different aspects of new venture creation, and their role in business and society, - Demonstrate knowledge and understanding of aspects of environmental sustainability and its role in new venture creation, - Demonstrate knowledge and understanding within the field of entrepreneurship, including both an overview of the field and specialized knowledge of certain parts of the field, as well as insight into current research and development work, - Demonstrate knowledge and understanding of specific aspects of entrepreneurship such as an independent new venture (e.g., legislation, finance, planning), and the theoretical and practical implications of that knowledge and understanding; and - Demonstrate specialized methodological knowledge in the field of entrepreneurship.
Competence and skills	- Demonstrate knowledge and understanding of different aspects of new venture creation, and their role in business and society, - Demonstrate knowledge and understanding of aspects of environmental sustainability and its role in new venture creation, - Demonstrate knowledge and understanding within the field of entrepreneurship, including both an overview of the field and specialized knowledge of certain parts of the field, as well as insight into current research and development work, - Demonstrate knowledge and understanding of specific aspects of entrepreneurship such as an independent new venture (e.g., legislation, finance, planning), and the theoretical and practical implications of that knowledge and understanding; and - Demonstrate specialized methodological knowledge in the field of entrepreneurship. - Demonstrate the ability to report clearly in speech and writing and discuss one's conclusions and the knowledge and arguments on which they are based in dialogue with different audiences; - Demonstrate the ability to identify and formulate issues autonomously as well as to plan, using appropriate methods, and to undertake advanced tasks within predetermined time frames; - Demonstrate the skills required for participation in research and development work or employment in some other qualified capacity; and - Demonstrate the ability to work in multicultural teams.
Judgment and approach	- Demonstrate the ability to make assessments within entrepreneurship, informed by relevant disciplinary, social and ethical issues and also demonstrate awareness of ethical aspects of research and development work; - Demonstrate an understanding of the role of entrepreneurship and entrepreneurs for societal development and economic growth; - Demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used; and - Demonstrate the ability to identify the personal need for further knowledge and take responsibility for one's ongoing learning.

The program has the typical distinction of learning in entrepreneurship where students learn by means of real life practice. The objective learning outcomes that the students obtain when graduating from the program can be seen in Table 1.1. The stated learning outcomes indicate what a student will know and be able to do at the end of the program. However, the main focus is on developing student entrepreneurs who create entrepreneurial projects. Hence, the program does not only focus on learning what and how, but also why and when to make use of the entrepreneurial knowledge gained.

The main curricula consist of six compulsory courses that amount to 60 ECTS. Four courses run during the fall semester and two during the spring semester (see Figure 1.1).

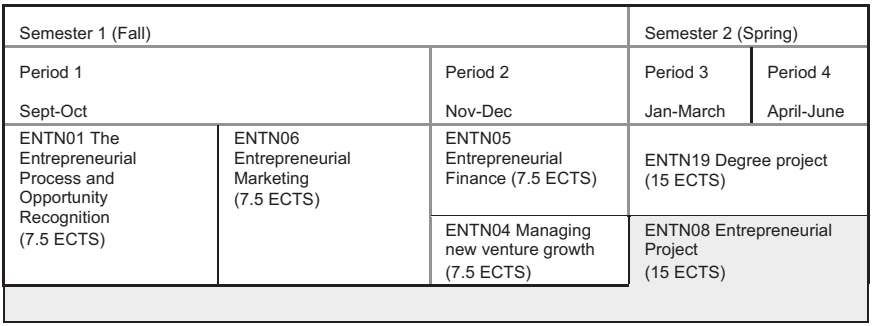


Figure 1.1: Program overview

The four courses during the fall semester are:

- The Entrepreneurial process and opportunity recognition (ENTN01), which deals with the issue of how to discover opportunities and includes a number of learning activities to aid the student in developing, searching for, and evaluating opportunities.
- Entrepreneurial marketing (ENTN06), which deals with the issue of how to identify and evaluate industries, and how to identify and communicate with potential customers. This course builds on the first course, the aim of which is to generate opportunities that are then tested and evaluated in the second course.
- Entrepreneurial finance (ENTN05) focuses on the issue of how to marshal the resources to launch a new business. The course connects to the previous two courses by providing knowledge on entrepreneurial financial behavior and the acquisition of financial resources.
- Managing new venture growth (ENTN04) dealing with the issue of how to create competitive advantage in the new venture when managing and growing it. The course connects to the previous two courses by providing knowledge

on how to manage and deal with decisions on how to grow a venture when moving out of the initial start-up phase.

The four courses during the fall semester cover entrepreneurship theories, methods, and applications from opportunity recognition to opportunity exploitation.

The spring semester hosts two courses, one of which is an entrepreneurial project and the other a degree project.

- The degree project (ENTN19) concerns how to conduct a scientific study, which is reported in the form of a thesis. The degree project aims to develop knowledge, skills, and abilities in conducting independent research to engage the students in problematizing, analyzing, and developing conclusions. The course runs half time during the entire spring semester.
- The entrepreneurial project (ENTN08) is a course that provides students with unique opportunities to become fully involved as entrepreneurs in a start-up process, thereby enabling them to gain real-life experience of starting up a new independent venture. To integrate knowledge throughout the program the entrepreneurial project course runs for the entire year, where each course during the fall serves as input for developing the entrepreneurial project. The students also write a reflective diary every second week during the program. The entrepreneurial project course concludes with the presentation of a written business plan, the organization of an entrepreneurial fair, and the writing of a meta-reflection report on the entrepreneurial learning process, based on each individual's reflective diary.

Besides initiating an entrepreneurial project the students are supported in their learning process through an integrated mentorship program, where each student is matched with an experienced mentor. In addition, the program also hosts a number of study group sessions, where the students share their individual perspectives on their learning activities over the year. Moreover, the students also have opportunities to compete and present their business ideas and business plans in different competitions, such as the Venture Cup, Pitchers Corner, and Dragons at the University. At the end of the program the students gain an opportunity to apply for seed finance and to apply for the Venture Lab pre-incubator located in the science park.

To achieve the learning outcomes of the program, the curriculum is supported by a specific pedagogical approach. When launched, the pedagogical approach was influenced by action oriented learning, thus the initial structure and theoretical foundation of the program was based on how entrepreneurs learn through practice, and the theoretical lens of Kolb's (1984) experiential learning cycle (concrete experience – reflective observation – abstract conceptualization – active experimentation). In addition to the pedagogical approach, the entrepreneurial environment was considered important for fostering an appropriate entrepreneurial eco-system. Over the years the program has evolved in terms of the influence of

learning theories in the pedagogical approach. The main root of experiential learning theory emanating from Kolb is still present, but the pedagogical development now includes more recent research that takes the educational setting when students learn through experience into account (e.g., Roberts, 2012, 2015). The pedagogical approach is grounded in a belief that to learn entrepreneurship you need to include practice, but at the same you must also reflect on practice. Hence, in order to learn through entrepreneurial practice both action and reflective thinking are necessary, which at the same time does not downgrade the importance of the learning that can be achieved from theories in the domain of entrepreneurship.

1.3.2 Graduate statistics

Since the launch of the new venture creation program in 2007 until summer 2017, 300 students have graduated from it. The main statistics and demographics of the enrolled students and what the alumni did after graduation can be found in Table 1.2 below. The statistics are based on figures up to 2014 that include 207 alumni.

Table 1.2: Graduate statistics

Demographics of the enrolled students		
Educational background	**Geographical spread of bachelor degree students**	**Gender, average age, nationality, previous work experience**
- 52 % Business and economics - 22 % Technology and science - 13 % Social sciences (politics, law, psychology, archeology) - 13 % Humanities (art, history, languages, communication and media)	- 59 % Europe - 15 % USA - 13 % Asia - 5.5 % Africa, the middle east, and greater Arabia - 4 % Australia and Oceania - 3 % South America - 0.5 % Central America and The Caribbean	- 28 % Female - 72 % Male - Average age at entry: 27 years - 50 % with Swedish civic number - 50 % foreign born students[2] - 36 % with prior start-up experience - Average work experience: 4 years
Occupational status after graduation		
29.5 % are self-employed 13.5 % hybrid entrepreneurs (combining self-employment with paid employment) 47 % employed 10 % other (students, between jobs, PhD-students, paternity leave, etc.) 46 % of the self-employed/hybrid entrepreneurs have pursued the business idea formed during the program Roughly 60 % of the self-employed or hybrid graduates have remained in Sweden, which is interesting as 76 % studied for their bachelor degree outside Sweden.		

[2] This figure is higher in real terms as some students with a Swedish civic number are not natives, which is also evident from the high number of bachelor degrees taken outside Sweden.

1.4 Structure of the dissertation

This dissertation is structured as follows: In the next chapter the theoretical grounds are discussed, leading up to a tentative model for understanding the balance between action and reflective thinking. In chapter three, research design, the philosophical approach is discussed followed by my research process including the four appended papers. Chapter three concludes with the different methodological considerations taken in the process of producing this dissertation. In the last chapter, chapter four, the two research questions are answered, followed by a modified conceptual framework, implications for theory, teaching and learning, as well as for future research, and a final conclusion.

2. Theoretical framework: A tentative model for understanding the balance between action and reflective thinking in experiential entrepreneurship education

In the previous chapter I have argued that to learn entrepreneurship, student entrepreneurs need to balance action and reflective thinking. In addition, I have stated that multiple views on learning theories and pedagogical methods need to be acknowledged to facilitate this balanced learning process. In particular, I have argued for a theoretical foundation based on experience-based pedagogy together with research, acknowledging how different types of knowledge are developed in an educational setting. In this dissertation I argue that reflective thinking, as a theoretical construct, is the means for transforming entrepreneurial action into entrepreneurial knowledge. Reflective thinking can in this respect be developed through different pedagogical methods. In the following sections the streams of theory that have influenced this dissertation will be discussed, followed by a tentative model that will serve as a foundation for the three empirical studies in this dissertation.

2.1 Learning in experiential entrepreneurship education

It is widely acknowledged that action is an integral part of entrepreneurship education (Gielnik et al., 2015; Kassean, Vanevenhoven, Liguori, & Winkel, 2015; Neck & Greene, 2011). A common denominator emphasizing action has been expressed in previous studies on entrepreneurial learning, where learning-by-doing and experiential learning theories have been highly discussed (Hills, 1988; Pittaway & Cope, 2007b; Politis, 2005b). The continued discussions in the field of entrepreneurship education have strongly emphasized action when designing

pedagogical methods, thus today action has become a basic assumption for how to view learning in entrepreneurship. This action orientation has been especially highlighted in education that explicitly adopts experience-based pedagogy (Rasmussen & Sørheim, 2006). In this dissertation experience-based pedagogy should be understood as pedagogies that are learner-centered and in different ways promote personal experience as the primary source of learning (e.g., via simulations, live-cases, actual real life experiences), making them distinct from traditional educational pedagogy (e.g., via lectures, seminars etc.), where teachers are seen as providers of knowledge and students as depositors of knowledge (Freire, 1970). Students following this type of entrepreneurship education typically have a genuine interest in actually pursuing and at some point in time starting a new venture (Fayolle & Gailly, 2008; Lackéus, 2014). In previous research this type of education has mostly been associated with education promoting learning for and in entrepreneurship, where the use of simulations, cases and real life-experience served as important methods (Pittaway & Cope, 2007b; Scott, Penaluna, & Thompson, 2016; Solomon & Fernald, 1991; Solomon, Weaver, & Fernald, 1994). Entrepreneurship education has in the past decade intensified the focus on the entrepreneurial process (Hjorth, 2011; Pittaway & Thorpe, 2012), with teaching methods influenced by experience-based pedagogy (Roberts, 2012, 2015), and with an emphasis on constructivist and learner-centered approaches (Löbler, 2006; Mueller & Anderson, 2014).

Experience-based pedagogy consists of three interrelated components that facilitate learning, action, reflective thinking, and domain-specific knowledge. These components are all connected to the interaction of body and mind in the learning process (Hickman, 1992). Action is a component related to the body and materializes when student entrepreneurs learn through experience (Kolb, 1984; Roberts, 2012). However, action alone does not generate learning but needs to be complemented by the components of reflective thinking and domain-specific knowledge, which are both connected to the mind (Boud et al., 1985; Dewey, 1916a; Itin, 1999). The importance of domain-specific knowledge for learning is emphasized by cognitive load theory, which argues that humans create associations between different types of knowledge based on prior experiences, which are stored in the long-term memory through meaning schemes (Sweller, 2015a; Sweller, Ayres, & Kalyuga, 2011). Reflective thinking connects action with domain-specific knowledge, in which meaningful learning experiences are developed into knowledge accumulation (Dewey, 1946). Reflective thinking is defined as: “active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends” (Dewey, 1910, p. 6).

A major concern with having a strong emphasis on action in entrepreneurship education is that student entrepreneurs lack the ability to digest the actions they undertake, and turn them into learning experiences (e.g., Hägg & Kurczewska,

2016; Lackéus, 2014). According to cognitive load theory, this becomes problematic when tailoring instructional methods for students at different learning levels (Sweller et al., 2011). When adopting an action orientation in entrepreneurship education, we thus need to consider that student entrepreneurs often lack prior entrepreneurial experience, which in turn creates a shortage of domain-specific knowledge that is necessary for them to develop entrepreneurial knowledge (Kalyuga et al., 2003; Sweller et al., 2011). Domain-specific knowledge consists of "the declarative, procedural, or conditional knowledge one possess relative to a particular field of study" (Alexander & Judy, 1988, p. 376). To learn from experience domain-specific knowledge is necessary, as it enables one to reflect and compare different perspectives on the learning experience (Dewey, 1916b, 1930; Mezirow, 1991). Domain-specific knowledge can therefore be understood as the conceptual frameworks student entrepreneurs make use of when reflectively thinking about their actions, which together forms valuable experiences for future actions.

To summarize, the above discussion on the need to create a balance between action and reflective thinking is two-fold. Firstly, it relies on the basic assumptions in experience-based pedagogy, which highlight the importance of action and reflective thinking for creating a fruitful learning process (Itin, 1999). Experience-based pedagogy has made an impact on how learning is understood and promoted in entrepreneurship education (Gielnik et al., 2015; Kassean et al., 2015; Rasmussen & Sørheim, 2006). However, at the same time it has been argued that entrepreneurship education needs to strengthen its theoretical foundation and take a critical stance towards its own development (Fayolle, 2013). In this vein, the overt focus on action has raced far ahead of the theory that underlies and explains this pedagogy (Rideout & Gray, 2013), which calls for a stronger theoretical foundation of experience-based pedagogy in entrepreneurship education. Secondly, it relies on cognitive load theory, which leans on the expert-novice literature (Ericsson & Charness, 1994; Ericsson, Krampe, & Tesch-Römer, 1993). Cognitive load theory posits that inexperienced individuals might become cramped in situations of high complexity, which means that their cognitive capacity to solve problems is reduced due to the shortage of domain-specific knowledge (de Jong, 2010; Paas & Van Merriënboer, 1994; Sweller, 2015b). To compensate for student entrepreneurs' lack of prior entrepreneurial experience, it is important to consider recent advances in cognitive load theory in order to understand how to tailor experientially oriented learning interventions in entrepreneurship education.

To address the above concerns, this chapter aims to synthesize theoretical developments made in entrepreneurship education, experiential education literature, and cognitive load theory, and present a tentative model illustrating how student entrepreneurs learn through experiential entrepreneurship education. The rest of the chapter is structured as follows: First a discussion on the term experience and its relation to experience-based pedagogy and entrepreneurship

will be presented, followed by a review of experience-based learning theories used in contemporary research on entrepreneurship education. After the review, a discussion on experiential education is presented followed by insights derived from cognitive load theory. A synthesized discussion for developing the tentative model is then presented. The chapter ends with a discussion on how the tentative model has guided the empirical studies of this dissertation.

2.2 Experience and its relationship to entrepreneurship and experience-based pedagogy

As Jay (2005) argues, experience might be one of the most debated terms in research, as it spans several ontological and epistemological domains and carries different meanings depending on how it is viewed. It is both a philosophical construct and a common everyday practice, making it a difficult phenomenon to grasp and research (Hägg & Kurczewska, 2016). For the sake of clarity, experience is in this dissertation defined as "the total response of a person to a situation or event, what she/he thinks, feels, does and concludes at the time and immediately thereafter" (Boud et al., 1985, p. 18). This definition makes it evident that an experience has two sides, which have been termed primary and secondary experience (Dewey, 1958). Primary experience is the active side that addresses the physical side of experiencing, while secondary experience is related to reflective thinking (Dewey, 1916a; Jay, 2005). It is not until an individual engages in secondary experience that she/he recaptures primary experience, and by working with it, thinking about it, and evaluating it, the process of learning is generated, and in a final stage, knowledge can be developed (Boud et al., 1985; Dewey, 1916a; Rodgers, 2002). The dualism of experience is related to the interplay between body and mind (Dewey, 1958), and is further highlighted in the German division between erlebnis; in the moment experience, and erfahrung; reflective and cumulative experience (Jay, 2005).

In the literature on entrepreneurship, and entrepreneurship education in particular, we often talk about primary experience (Gielnik et al., 2015), the entrepreneurial action (Bygrave & Minniti, 2000; McMullen & Shepherd, 2006), as an important trigger for entrepreneurial learning (Minniti & Bygrave, 2001; Pittaway, Missing, Hudson, & Maragh, 2009). The other side of experience, secondary experience, has in entrepreneurship education been addressed in the form of reflective thinking, emphasizing the importance of making students reflect on what they are doing (Jack & Anderson, 1999; Neck & Greene, 2011; Williams Middleton & Donnellon, 2014). However, addressing the two sides of experience simultaneously has been less studied, although it has recently been recognized as

important (Kassean et al., 2015; Lindh & Thorgren, 2016). In entrepreneurship education the final act of knowledge production has been left uncovered (Politis, 2005a), although it has been debated in contemporary discussions, where the focus on reflective thinking in relation to learning experiences has intensified (Kassean et al., 2015; Neck & Greene, 2011; Pepin, 2012; Pittaway & Cope, 2007b).

With regard to experience-based pedagogy, experience has always been deemed a central component, where both learning and experiencing is considered a lifetime process that goes hand in hand with human development (Dewey, 1916a). Experience is generally considered the foundation for developing meaningful learning that engages the learner in the learning process (Boyd & Fales, 1983; Dewey, 1946; Itin, 1999; Roberts, 2012). However, not all experiences are equally valued for learning. Valuable experiences are those that interact and are linked to future experiences (Dewey, 1916a). Dewey terms these experiences educative experiences, as they build continuity in the learning process (Rodgers, 2002). Through engaging in secondary experience the primary experience becomes meaningful and through reflective thinking we are able to generate an increased understanding of the primary experience, which changes our cognitive state, enabling the development of foresight for engaging in future experiences.

2.3 Experience-based learning theories used in entrepreneurship education

Today, experience-based learning theories serve as the main conceptual foundation for entrepreneurship education (Fayolle, 2013; Kyrö, 2015; Rideout & Gray, 2013). When discussing experience-based learning, it is important to acknowledge that there are distinctive types of entrepreneurship education. Fayolle and Gailly (2008) highlight that entrepreneurship education differs depending on the goals. In addition, they distinguish between different types of entrepreneurship education based on two levels: the ontological level, i.e., what does entrepreneurship education mean, its context and the role of teachers and participants, and the educational level, i.e., what, how, why, to whom, and which results are expected as an outcome of the education (Fayolle & Gailly, 2008, p. 572).

The diversity of entrepreneurship education can also be understood by addressing the division between learning about, for, in and through entrepreneurship (Gibb, 2002; Hoppe et al., 2017; Rae, 2007). Learning about entrepreneurship concerns knowledge of what entrepreneurship is, associated with factual knowledge. Learning for entrepreneurship has been associated with learning by doing and knowing how to conduct entrepreneurship through

simulations. Learning in entrepreneurship tries to mimic the process of how entrepreneurs learn in practice and strives to develop a reflective practitioner by connecting reflection, experiential skills (know-how), and factual knowledge (know-what) in various constellations (Pittaway & Cope, 2007b, p. 215). Learning through entrepreneurship takes a slightly different path and aims to broaden the conception of entrepreneurship and transfer it into different scholarly domains, often known as a pedagogical process of becoming enterprising (Hoppe et al., 2017; Jones & Iredale, 2010).

Recent discussions in entrepreneurship education have intensified the focus on constructivist views on learning (Löbler, 2006; Mueller & Anderson, 2014), implying that the emphasis is on understanding how students construct knowledge and in what ways pedagogical methods could facilitate this process of learning. Accordingly, research has mainly targeted learning theories aiming to explain how individuals learn from experience.

Contemporary researchers have particularly argued for the use of action learning (Pittaway & Cope, 2007b), experiential learning theory (Dhliwayo, 2008; Scott et al., 2016), and problem-based learning theory (San Tan & Ng, 2006) in their efforts to develop curriculums for entrepreneurship education (Kassean et al., 2015; Mandel & Noyes, 2016; Rideout & Gray, 2013). Although these learning theories have advantages when it comes to educating students to become entrepreneurs they are also bound to their origins, which means that they have been tailored to fit the context they were first intended for. However, if we aim to understand how student entrepreneurs develop entrepreneurial knowledge through experiential entrepreneurship education we have to adapt and modify existing theories in conjunction with advances in the domain of entrepreneurship.

To develop a tentative model with a theoretical foundation based on experience-based pedagogy, I will discuss the three main theoretical strands that have been used in entrepreneurship education literature: action learning (Revans, 1982), experiential learning (Kolb, 1984), and problem-based learning (Barrows & Tramblyn, 1980). Each of these theories is discussed separately, followed by a combined discussion related to entrepreneurship.

2.3.1 Action learning

Reg Revans established action learning in the 1970s, arguing that there could be no learning without action, and no (sober and deliberate) action without learning. The main facets of this learning theory are its focus on collaborative learning and experience, where questioning insight is a vital aspect. This questioning occurs when the learners pose fresh questions and use critical reflection to solve the problems they are facing (Pedler, Burgoyne, & Brook, 2005; Revans, 1982). Action learning was developed in close connection with organization and

management education, triggered by opposition to expert consultancy and traditional business school practice (Pedler, 2011; Pedler et al., 2005; Revans, 2011).

Action learning is based on several basic assumptions. Firstly, it is a team-learning theory, where sets of about six people are considered optimal. Secondly, the action should be guided by real tasks or work related problems, from which learning is then derived by critically reflecting on the actions taken. The problems used for developing the learning process are based on individual rather than collective problems, but solved through the efforts of the team. In order to solve the problem, questioning insights are seen as the main procedure. Finally, learning is connected to an existing program (either in education or within an organization), where facilitators guide the learning process (Pedler et al., 2005, p. 54). In light of this, action learning can be considered highly connected to work related problems, as it is based on the problems and struggles individuals experience within an organizational context, where the aim is to solve these problems through collaborative efforts, including critical reflection derived from questioning insights within a team.

In relation to entrepreneurship education, action learning has been frequently used in research on enterprise learning and is closely tied to research conducted in the UK. Action learning has thus been applied in small business and enterprise education, as a method for developing students' abilities to learn entrepreneurship through simulations, with the aim that the learning activities should mirror the reality of actual start-ups and business plan projects (Jones-Evans, Williams, & Deacon, 2000; Pittaway & Cope, 2007b; Rae, 2009).

2.3.2 Experiential learning

David Kolb developed experiential learning theory in the 1970s, where the main idea rests on the assumption that individuals learn from experience through an experiential learning cycle, composed of concrete experience, reflective observation, abstract conceptualization, and active experimentation. The learning cycle consists of two dual dialectics, one that spans between concrete experience and abstract conceptualization, while the other spans between reflective observation and active experimentation (Kolb & Kolb, 2005; Kolb, 1984). The main assumptions of this theory are that learning (1) is regarded as a process and not an outcome, (2) is derived from personal experiences, (3) requires the individual to resolve dialectically opposing demands that emphasizes judgment in the learning process, (4) is integrative and holistic, (5) demands an interplay between the learner and the environment, and (6) is a process that should lead to knowledge creation, influenced by the framing and perception of the situation, due

to the fact that learners continually depart from different levels of knowledge and understanding (Kolb, 1984, pp. 25-38).

Besides the experiential learning cycle, the learning style inventory was developed as a compliment for educative and professional use. With regard to the learning style inventory, Kolb and Kolb (2009, p. 315) argue that learning styles should not be considered as psychological traits, but instead as a dynamic state built up through synergies between the person and the environment. In this respect, the preferred learning style of an individual is based on the resolution of the dual dialectics in experiencing-conceptualizing and observing-experimenting (Kolb & Kolb, 2009). Based on the above ideas Kolb (1984, p. 41) defined experiential learning theory as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience". On the basis of this definition and Kolb's explanation of his theory, learning is seen as dependent on experience and located on an individual level, but in order to learn Kolb also acknowledged the dynamic state between the individual and the environment in which she/he is positioned.

The application of experiential learning theory in entrepreneurship education has been highly influential through research on entrepreneurial learning. Studies have confirmed that entrepreneurs learn by doing, especially through lived experience (Cope & Watts, 2000; Corbett, 2005; Politis, 2005b). This recognition has to a large extent impacted on the pedagogical development in entrepreneurship education and directed attention to the introduction of more action and experience-based pedagogical approaches (Dhliwayo, 2008; Duval-Couetil, Shartrand, & Reed-Rhoads, 2015; Rasmussen & Sørheim, 2006; Scott et al., 2016). Experiential learning theory has thus played a prominent role in understanding how practicing entrepreneurs learn. The insights gained were then adopted into entrepreneurship education as a source for understanding how to create a learning environment beneficial for developing entrepreneurial knowledge. In this respect, Kolb's experiential learning theory has been commonly used as a foundation for entrepreneurship education research (e.g., Dhliwayo, 2008; Gundry & Kickul, 1996; Kozlinska, 2011).

2.3.3 Problem-based learning

Problem-based learning theory was developed during the 1960s as the 'McMaster philosophy' closely tied to medical education (Neufeld & Barrows, 1974) and was influenced by the Harvard Law School case-study method (Schmidt, 1993). The main idea is to grasp an ill-structured problem by first discussing it in small groups without reference to the literature (Barrows & Tramblyn, 1980; Savery, 2006; Schmidt, 1983, 1993). The basic assumptions are to (1) mobilize the knowledge one already possesses, (2) by enabling students to elaborate on their knowledge by

means of group discussions, (3) where the knowledge in their possession becomes tuned to the context of the problem posed, (4) and through these group discussions the problem should engage the students in the subject so that their epistemic curiosity is aroused (Schmidt, 1993, p. 428). Epistemic curiosity is an individual's intrinsic motivation, which drives the person into knowing more about a topic (Berlyne, 1957; Litman & Spielberger, 2003; Schmidt, 1993).

Problem-based learning is a learner-centered pedagogy that integrates theory and practice in order to apply knowledge and skills to find solutions to a defined problem (Savery, 2006). Two key assumptions are emphasized in problem-based learning: (1) learners actively construct knowledge in collaborative groups, and (2) the roles of the student and teacher are transformed, which means that the teacher is a facilitator and not the main source of knowledge (Hmelo-Silver, 2004). To enhance learning, education is expected to help students to activate relevant prior knowledge, to provide contexts that resemble the professional context as closely as possible, and encourage students to elaborate on their knowledge (Schmidt, 1983). In line with these assumptions, problem-based learning is designed for students to tackle problems, preferably real life and ill structured events, in small groups supervised by a facilitator (Hansemark, 1998; Hmelo-Silver, 2004; Neufeld & Barrows, 1974; Savery, 2006; Schmidt, 1993).

Based on the above discussion, problem-based learning can be considered a process built on collaborative learning, where the emphasis is on solving ill-structured real life problems through discussions in small groups followed by critical analysis, using the knowledge in one's possession, later supported by the literature. The problems are pre-defined by the facilitator and therefore not developed by the students. In entrepreneurship education, problem-based learning has been applied to develop epistemic curiosity among students in relation to entrepreneurship as a subject, but also as a way of generating conclusions on different real life entrepreneurial problems (San Tan & Ng, 2006; Wee, 2004). This focus on using real life entrepreneurial problems is considered to prepare students for and make them more familiar with life as an entrepreneur, but also as a means of generating knowledge related to the entrepreneurial process (Hansemark, 1998; Krueger, 2007; Wee, 2004).

2.3.4 A synthesized discussion on experience-based learning theories

The above learning theories are all based on the idea that experience serves as a foundation for the development of knowledge, but when it comes to how the learning takes place they encompass different processes. In the following discussion I will elaborate on the various advantages and limitations of each learning theory with respect to experiential entrepreneurship education. The learning theories are presented in Table 2.1.

Table 2.1: Experience-based learning theories and their application in entrepreneurship education

Aspect/ Theory	Action Learning	Experiential Learning	Problem-based Learning
Main definition	No main definition, instead a learning equation (Revans, 2011): L = P + Q L = learning P = programmed knowledge Q = questioning insight	"The process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (Kolb, 1984, p. 41)	"Learning results from the process of working toward the understanding or resolution of a problem. Problem refers to an unsettled or puzzling issue that needs to be resolved, encountered in learning, as stimulus for problem-solving" (Barrows & Tamblyn, 1980, p. 18)
Key contributors	Pedler et al. (2005) Revans (2011)	Kolb (1984) Kolb & Kolb (2009)	Barrows & Tamblyn (1980) Schmidt (1993)
Core assumptions	- Learner centered - Experience - Team learning	- Learner centered - Experience - Individual learning	- Learner centered - Experience - Group learning
Similarities	- Reflection: key part of the learning process - Experience is important for the learner	- Reflection: key part of the learning process - Experience is important for the learner	- Reflection: key part of the learning process - Experience is important for the learner
Differences	- Organizational learning - Team learning - Individual problems, but team solution	- Individual learning - Learning cycle - Learning styles	- Education perspective - Small groups and collaborative learning - Pre-defined problems
Central concepts	- Team learning - Action - Critical questioning - Reflection	- Individual learning - Experiential learning cycle - Act, observe, abstract, experiment	- Defined problems - Fictional and live cases - Small group tutorials - Reasoning and reflection
Origins and roots	Developed by Reg Revans in Britain during the 1970s, as an educational intervention in organization and management. Rooted in the thoughts of Lewin and Dewey (Marsick & O'Neil, 1999).	Developed by Kolb (1984), and rooted in theories from Dewey, Lewin, Piaget, and Freire. Broad focus on all types of education. Kolb developed a learning style inventory in connection with his experiential learning theory.	Developed at the McMaster University medical school in the 1960s (Neufeld & Barrows, 1974). It evolved through an innovative health science curricula (Savery, 2006), and is based on the Harvard case method. Its roots are found in Dewey's progressive educational movement.
Application in entrepreneurship education	- Main influence from British scholars - Enterprise learning	- Influential through entrepreneurial learning - Learning-by-doing	- Tested and applied as a teaching method for students interested in becoming entrepreneurs
Key research in entrepreneurship	Jones-Evans, Williams & Deacon (2000) Pittaway & Cope (2007) Rae (2009)	Cope & Watts (2000) Politis (2005a,b) Corbett (2005, 2007) Dhliwayo (2008)	Hansemark (1998) Wee (2004) San Tan & Ng (2006) Krueger (2007)

All three learning theories use experience as a main source for learning (Kolb, 1984; Pedler et al., 2005; Savery, 2006) but in different ways, which creates opportunities to adopt various elements and recommendations from them on how to educate student entrepreneurs in the context of experiential entrepreneurship education.

The different core elements of each learning theory might serve as a trigger for learning within entrepreneurship education and stimulate different types of entrepreneurial knowledge. For example, action learning focuses on team learning (Revans, 1982, 2011), which acknowledges that entrepreneurship is not only considered an individual undertaking, but entails organizational problems that create opportunities for students to discuss post start-up phases often related to small business management and the growth stages as well as additional areas such as corporate entrepreneurship.

On the other hand, problem-based learning works well with pre-defined problems (Hansemark, 1998; Hmelo-Silver, 2004; Neufeld and Barrows, 1974; Savery, 2006; Schmidt, 1993), which could be used to prepare students for future real-life experiences, thus creating initial entrepreneurial knowledge in a similar way to how practicing entrepreneurs acquire knowledge (Deakins & Freel, 1998). Through problem-based learning, student entrepreneurs can gain important factual knowledge and practice how to solve potential entrepreneurial problems that they might face in the future. This type of learning would prepare students to develop an ability to take initial decisions based on judgment that would otherwise be made in true uncertainty (Knight, 1921).

Finally, experiential learning theory takes the individual learner into consideration and brings value through its focus on the experiential learning cycle, including the action-reflection-conceptualization-experimentation stages (Kolb, 1984). This type of learning process is highly important as a frame for building learning activities in experiential education. Together, the three learning theories contain important ingredients for developing an experiential learning process in entrepreneurship education as they jointly consider both collaborative and individual learning.

Although the three learning theories have several advantages when educating student entrepreneurs, the application of these theories must be positioned within the systematic process that entrepreneurship education entails (Roberts, 2015). In this respect, literature on experiential education and cognitive load theory may be helpful to further our understanding about student entrepreneurs' learning process.

2.3.5 Experiential education and cognitive load theory as a potential theoretical foundation

In order to fully capture experiential entrepreneurship education and provide insights on how to educate student entrepreneurs, we need an educational theory that is based on learning through experience, but one that also allows for modifications in relation to the entrepreneurial domain. In this respect, the antecedents of the three learning theories discussed in the previous section all are based on the notions of progressive education, which have been termed

experiential education in contemporary discussions (Roberts, 2015). However, the main difference is that experiential education is a theory that focuses on both curricula design and student learning, while the three learning theories are mainly concerned with understanding how (student) learning is achieved.

A conceptual framework for entrepreneurship education should be grounded in knowledge of how entrepreneurs learn, but also in theory on learning through experience, where not only the individual is considered, but also the educational context and the learning transactions that take place (Itin, 1999; Rorty, 1999), together with current theorizing on cognitive learning in educational science (Sweller, 2015a, 2015b). Although valuable insights have been gained by adopting the theoretical lenses of experiential learning theory, action learning, and problem-based learning, these learning theories were specifically developed to understand learning without taking the educational process as an integrative part of learning into consideration (Roberts, 2015). In order to build a tentative model specifically developed for experiential entrepreneurship education that seeks to balance action and reflective thinking, we have to consider the origins and the basic assumptions of experiential education as well as the advances made in cognitive load theory. The following sections will address the two above-mentioned theories to clarify the building blocks for the synthesized discussion and development of the tentative model.

2.4 Experiential education

Experiential education is rooted in the progressive educational thoughts of John Dewey, who even today is still seen as one of the most influential educational philosophers (Jay, 2005; Roberts, 2012). Experiential education questioned the old school of thought where the learner was considered a passive recipient of knowledge and the tutor the source of knowledge (Dewey, 1946). Instead, a more learner-centered approach and the promotion of experience were argued to be the foundation in learning (Breunig, 2005; Itin, 1999; Roberts, 2015). The basic assumption in experiential education is that learning includes multiple transactions between learners, the learner and the educator, as well as between the learner and the environment (Itin, 1999). This makes experiential education transactive, as it takes into account how the individual learns, how this process is stimulated through learning from peers, and how the context influences the learning situation. Taken together, experiential education aims to stimulate students' learning by creating opportunities for them to take initiatives, make decisions, become responsible for their own learning, investigate and experiment through problem solving (Itin, 1999; Roberts, 2012).

Experience has always been a key ingredient in the experiential education literature. Research shows that learning is developed through experience, either past or present (Boud et al., 1985; Boyd & Fales, 1983). Experience is in this context related to the pragmatic view, and especially the instrumentalist perspective, implying that having an experience means an integration of reflective thinking and in the moment doing and feeling (Roberts, 2012). Although experiential education has its foundation in learning through experience, it still acknowledges that learning will not develop into knowledge if factual knowledge is lacking (Dewey, 1930; Itin, 1999). In this view, concepts and theories are seen as useful instruments due to their effectiveness in assisting students to understand experiences (Dewey, 1958; James, 1907). To grasp experiential education and its focus on how learning through experience is developed into knowledge, the following sections will address the interplay between different types of knowledge in the learning process, followed by the logic of inquiry that recognizes the importance of reflective thinking in the learning process.

2.4.1 Interplay between different types of knowledge in the learning process

Early proponents of experiential education discussed knowledge in relation to technology, in which knowledge was conceptualized as the combination of theory and practice developed through inquiry (Hickman, 1992). Dewey (1930, pp. 163-166) made the following statement about the experimental theory of knowledge.

> The object of knowledge is eventual, it is an outcome of directed experimental operations, instead of something in sufficient existence before the act of knowing… The art of knowing demands skill in selecting appropriate sense-data (experiences) on one side and connecting principles, or conceptual theories, on the other. It requires a developed and constantly progressive technique to settle upon both the observational data and the idea that assist inquiry (reflective thinking) in reaching a conclusion in any particular case. The two (experience and conceptual theories) are constantly working together to effect a rearrangement of the original experienced material in the construction of a new object having the properties that make it understood or known.

Based on these early discussions on how to conceptualize knowledge in experiential education (e.g., Dewey, 1930), where the point of departure was the categorization of the Aristotelian virtues (Gustavsson, 2002; Hickman, 1992; Jay, 2005), current research on knowledge in education distinguishes between types. Today it is argued that any type of knowledge consists of declarative, procedural, and conditional knowledge (Alexander et al., 1991; Schraw & Dennison, 1994; Vermunt & Verloop, 1999). Declarative knowledge is factual knowledge about a

subject, also termed know what. Procedural knowledge concerns skills about how to conduct a task, also termed know how. Conditional knowledge involves knowing when and why to use one's declarative and procedural knowledge, expressed as know why and when. These three types of knowledge can be learned one by one, or learned together in a learning activity. We do not necessarily know how to use our knowledge or when and why to apply it, even though we know what it is (Alexander et al., 1991). Together the three types of knowledge constitute the foundation of domain-specific knowledge, which refers to the knowledge a person possesses about a particular field of study (Alexander & Judy, 1988).

These types of knowledge have also been addressed in research on entrepreneurial learning and education (Johannisson, 1991; Politis, 2005a; Ronstadt, 1985), which was discussed in chapter one under section 1.2.2. Johannisson (1991) developed a two-dimensional classification scheme for entrepreneurial knowledge where he used the above-mentioned categories and added the knowledge category of know-who (networking capability). This differentiation of entrepreneurial knowledge based on different types of knowing was also discussed by Ronstadt (1985) and proposed as a way of portraying the different types of entrepreneurial knowledge needed when engaging in entrepreneurship courses. However, Johannisson (1991) made these different types more explicit by tying the different types of knowing to specific forms of learning. All types of knowing except know-who are explained on a more fundamental basis in educational science (see e.g., Alexander, 1992; Schunk, 2012) and can be seen as a means of explaining different types of entrepreneurial knowledge. The additional category of know-who in Johannisson's (1991) framework can be connected to the socializing responsibility placed on education, seen as developing student entrepreneurs' ability to gain contextual awareness.

2.4.2 Logic of inquiry

The logic of inquiry is built on the scientific method based on a "Darwinian view to account for a changing and dynamic world, and is grounded in the lived experience" (Roberts, 2012, p. 55). In this logic, reflective thinking is described as an ability to go from primary experience through secondary experience in a directional way when developing knowledge. Reflective thinking is not only a careful consideration of the conditions underlying the primary experience. It also includes an ability to go beyond the primary experience and gain additional perspectives to find potential solutions and make the experience into a determined situation (Hickman, 1992). In this way, the learner connects principles or conceptual theories as tools for developing new insights through engaging in secondary experience (e.g., Dewey, 1910, 1930; Hickman, 1992; Rodgers, 2002).

The logic of inquiry addresses the dialectics of body and mind, which is captured through moving from primary to secondary experience, and where reflective thinking is the means to develop knowledge. In line with this, theory (mind) and practice (body) can be regarded as complimentary phases of "intelligent inquiry, theory being the ideal act and practice the executed insight" (Hickman, 1992, p. 111).

Rodgers (2002, p. 845) has outlined four criteria that build on Dewey's (1910) conceptualization of reflective thinking. Firstly, reflective thinking is a meaning-making process that relies on continuity between experiences (Dewey, 1938, 1946), which ensures progression for the individual learner (Dewey, 1916a). Secondly, it is a systematic, rigorous, disciplined way of thinking, rooted in a Darwinian view of the scientific method (Roberts, 2012). Thirdly, reflective thinking is a dialectical process (Dewey, 1946). In the experiential education literature reflective thinking is developed through engaging in the transactive process that takes place between the student entrepreneur, her/his peers, the facilitators, and the environment (Itin, 1999; Roberts, 2015). Fourthly, reflective thinking requires attitudes that value the personal and intellectual growth of the individual learner and of the related stakeholders in the transactive learning process (Dewey, 1916a; Roberts, 2012). This implies that both the student and the other party in a transactive process have something to gain, where student entrepreneurs can develop new perspectives by engaging in the process of inquiry (Dewey, 1930; Garrison, 1995; Rodgers, 2002).

2.5 Cognitive load theory

Cognitive load theory was developed by Sweller (1988) in order to explain how instructional designs can be tailored in relation to student learning and problem solving. Although many students are able to derive the right conclusion when engaging in problem solving activities, few have the ability to discover the rule sequence that lay as a fundament for the problem to be solved. Based on these insights, Sweller conducted experiments identifying the cognitive mechanisms that highlighted the error in his experiments, where individuals solved the problem but seemed to learn little from the task. In this quest the main emphasis was to understand how long-term memory and working-memory interact when students conduct means-end analysis for solving problems (Cowan, 2001; Sweller et al., 2011; Sweller, Kirschner, & Clark, 2007). As working-memory capacity is limited (e.g., Cowan, 2001), engaging inexperienced individuals in complex problem solving creates a high focus on the means-end strategy used for solving the problem, which detracts attention from learning. This implies that the focus is solely on the outcome and not on the problem solving process. In such situations,

little information is transferred to the long-term memory, such as learning the rule sequence for reaching the outcome, which can impede subsequent learning situations of a similar character.

2.5.1 Worked examples

Sweller (1994) argued that novice learners who are exposed to solving problems in highly complex situations might develop cognitive overload. Cognitive overload emerges when students lack the necessary knowledge of the task, and when there is a limited working-memory capacity that hinders their learning (Cowan, 2001; Sweller, 2015b). One way to decrease the cognitive load in problem-solving situations is to use worked examples instead of means-ends analysis. Worked examples make the information on the solution clear to the students and the focus is on understanding the rule logic for solving the problem (Sweller et al., 2007). The worked example effect occurs when learners are taught the solution to a problem. In this respect, previous research has demonstrated that students who are provided with the solution outperform learners who have to solve the problem by themselves (Sweller, 2015a). By providing worked examples the students learn how to apply the rule, which is then stored in the long-term memory and can be used in future problem-solving situations.

The benefit of storing information in the long-term memory is that it reduces the working-memory load. Our long-term memory is a huge store that contains vast amounts of domain-specific knowledge structures that are stored in hierarchically structured schemes. These stored knowledge structures allow humans to categorize different problems and facilitate the decision about how to solve them (Kalyuga et al., 2003). Our structured schemes as well as the connections between different schemes when dealing with closely related domains are developed through experience. They constantly develop over time and can be used in future situations. When we accumulate and store knowledge in the long-term memory, we decrease the load on the working-memory. In this way, our long-term memory functions as an automatic processor that complements our working memory when facing new problematic situations in familiar domains (Kirschner et al., 2006; Paas & Van Merriënboer, 1994).

2.5.2 Expertise reversal effect

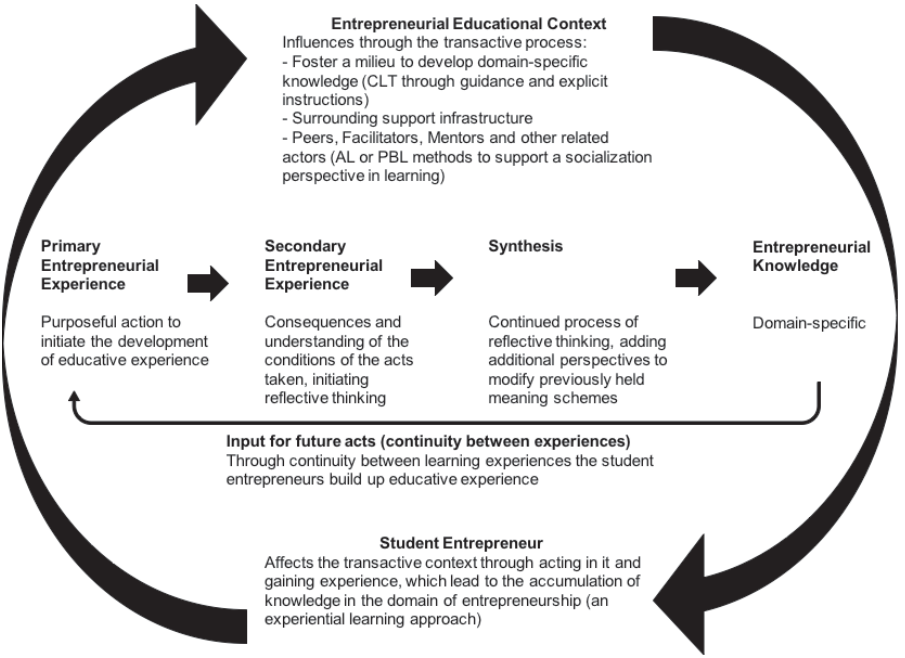
In more recent research on cognitive load theory, the expertise reversal effect in learning has been discussed (Kalyuga et al., 2003). The expertise reversal effect emerges when students' knowledge accumulation has moved from a novice state to a more proficient state. When students have learnt to apply rules for solving

problems and stored these rules in the long-term memory, worked examples no longer create fruitful learning arenas. This means that students who are familiar with and have experienced similar problem-solving situations in domain-specific subjects will not benefit from receiving instructions on how to solve the future problem. Therefore, when a learner's expertise increases, using worked examples decreases or even reverses learning. This is suggested to occur when students have increased their domain-specific knowledge, thus combining different knowledge into a single meaning scheme (Sweller, 2015b).

In summary, when learners are novices with limited domain-specific knowledge, using minimal guidance during learning will increase the load on their working memory. Consequently their learning will decrease. However, the effect is reversed when learners increase their expertise in a domain, which means that using explicit guidance and worked examples might even reduce the opportunity for learning. When relating these ideas to entrepreneurship education, insights from cognitive load theory indicate that depending on the stage of the learner, different levels of instruction are required to generate entrepreneurial knowledge. Hence, when developing pedagogical methods in entrepreneurship education there is also a need to address the cognitive perspective on how humans develop knowledge by considering the role of both working and long-term memory.

2.6 A tentative model for experiential entrepreneurship education

Based on the above discussion, a tentative model that builds on the logic of inquiry (Dewey, 1938), cognitive load theory (Kirschner et al., 2006) and experiential education literature (Roberts, 2012) is suggested for enabling a better understanding of how student entrepreneurs develop entrepreneurial knowledge, given that they might have a shortage of prior entrepreneurial knowledge. In this respect, we need a framework that takes into consideration how we can overcome this shortage and develop pedagogical methods for stimulating the ability to solve entrepreneurial problems. By using contemporary findings from entrepreneurship research and connecting them to experiential education, as well as to the literature on cognitive load theory, this section aims to synthesize these discussions. Experiential entrepreneurship education is in this dissertation seen as a transactive learning process between the student entrepreneur, her/his peers, and related actors (e.g., facilitators and mentors), as well as the entrepreneurial educational context. Learning within experiential entrepreneurship education entails entrepreneurial action (primary experience), entrepreneurial experience (secondary experience), and a synthesis supported by reflective thinking, which leads to the development



Model 2.1: The logic of experiential entrepreneurship education

of entrepreneurial knowledge. The components of the logic of experiential entrepreneurship education are depicted in Model 2.1, which will be further discussed and elaborated on.

2.6.1 Primary Entrepreneurial Experience

Experience is in this dissertation considered double-edged, consisting of two elements, primary and secondary experience. An active element of experience is about trying, also known as experimenting (Jay, 2005), which takes place through the entrepreneurial action. The action should be purposeful, because actions interact and are linked to future actions that together build educative experiences (Dewey, 1946). Hence, although the primary entrepreneurial experience is the initial step, there must be continuity between different primary entrepreneurial experiences to make them into an interlinked process of educative experience in which secondary entrepreneurial experience and synthesis also play important roles (Dewey, 1916a).

Action can be portrayed in different forms. This is of importance, as the entrepreneurial experience when developing entrepreneurial knowledge can be

extracted in several shapes from the entrepreneurial actions. These can range from simulated actions, such as fictional cases, live cases, simulated start-ups to actual real life experiences, where students are positioned in situations where risk and uncertainty are experienced, and not only instrumentally developed to mirror reality. The initial entrepreneurial action could take place through a trial and error approach, in line with the logic of effectuation (Sarasvathy, 2001, 2008) or realized through a planned approach where finding and developing an opportunity into a business idea might be the first move (Shane, 2000). It has long been argued that a key element of the entrepreneurial process is the search for business opportunities (Gundry & Kickul, 1996; Solomon & Fernald, 1991), which has been extensively discussed in previous literature (Baron, 2007; McMullen & Shepherd, 2006; Shane & Venkataraman, 2000; Venkataraman, 1997). In line with this research, action orientation has been considered essential for learning entrepreneurship (Gielnik et al., 2015; Johannisson, 1991; Kassean et al., 2015). However, to extract learning from action the secondary element of experience plays a central role. The secondary experience consists of gaining an understanding of the action that is undertaken (Dewey, 1916a, 1946).

2.6.2 Secondary Entrepreneurial experience

Secondary entrepreneurial experience consists of change, resulting in learning or un-learning. Having an experience is not necessarily bound to physical acts and is equally bound to the act of thinking (Dewey, 1946), where engaging in the secondary experience initiates reflective thinking by acknowledging the conditions underlying the primary entrepreneurial experience (Dewey, 1930). This makes experience something more than the mere physical connection to the body, as the mind has to be equally involved when developing knowledge from experience. The secondary entrepreneurial experience involves the first stage of engaging in reflective thinking where the student entrepreneur acknowledges the consequences and develops an initial understanding of the primary entrepreneurial experience. It is also in this stage that the student entrepreneur realizes the most important parts of the primary entrepreneurial experience. Hence, the initiation of reflective thinking that takes place in the secondary entrepreneurial experience serves as a sorting stage that focuses on the important parts that caused the student entrepreneur to engage in reflective thinking.

Therefore, in the proposed framework it is argued that learning entrepreneurship could be extracted from a multitude of different primary entrepreneurial experiences, but to engage in reflective thinking that is initiated by the secondary entrepreneurial experience, the primary experiences must be purposefully selected to generate educative experiences that challenge the student entrepreneurs' prior accumulated knowledge to stimulate learning in entrepreneurship as a subject-

domain. Furthermore, the primary entrepreneurial experiences must also be situated on a level of complexity that is manageable, but still challenging for the student entrepreneur. Otherwise, the students' cognitive capacity is insufficient to find solutions to the problematic situations they face (Sweller, 1988).

2.6.3 Synthesis

The synthesis occurs when primary and secondary experience and the use of factual knowledge come together through reflective thinking, which has previously been polarized by separating action and reflection (Boud & Walker, 1990; Mezirow, 1990; Rodgers, 2002). In the synthesis, different perspectives are weighted against each other and based on the outcome the student entrepreneur takes a decision on what path to follow and how to proceed with future actions. It is during the synthesis that reflective thinking becomes a means for transforming experiences into entrepreneurial knowledge.

By reflecting on the entrepreneurial experience, which includes the conditions from the primary experience acknowledged in the secondary experience (Dewey, 1910; 1930), student entrepreneurs are able to develop continuity between learning events through combining accumulated prior knowledge and new insights generated by reflectively thinking about the actions taken (Cope, 2003; Dewey, 1910; Lindh & Thorgren, 2016). Although it has been argued that reflective thinking is important in entrepreneurship education (Cope, 2003; Kassean et al., 2015; Neck & Greene, 2011), there is scant research explaining it in theoretical terms, and even less about how it actually works as a pedagogical tool in the entrepreneurial learning process. Reflective thinking is the key component for transforming experiences into knowledge (Boyd & Fales, 1983; Ertmer & Newby, 1996). Learning in experiential education differs from trial and error learning, where the latter is considered an unsystematic process (Marsick & Watkins, 2001). Trial and error is bound to the physical act of doing, where focus is on the bodily experience, while learning in experiential education emphasizes the importance of reflective thinking for understanding the experience, resting on the ability to think and reflect (Roberts, 2015). Dewey addressed the dilemma of the body and mind as the division between blind trial and error; experimentation without deliberation and direction, and intelligent action supported by reflective thinking (Biesta, 2007).

The above reasoning calls for a process view on learning when addressing how entrepreneurial knowledge is generated, acknowledging that pedagogical methods could be different, but the main aspect rests within the learning processes for generating entrepreneurial knowledge. The entrepreneurial action that is developed into an entrepreneurial experience is the catalyst, but will not generate entrepreneurial knowledge without the synthesis and domain-specific knowledge.

Through the synthesis, students develop either new meaning schemes or expand previously stored meaning schemes in the long-term memory. These meaning schemes can then be used in future entrepreneurial actions. In line with this view, student entrepreneurs develop experience into knowledge. Expert entrepreneurs also develop knowledge from and through experience, but through years of deliberate practice (Ericsson et al., 1993). The main difference between these two processes is that novices such as a student entrepreneur need to use a controlled learning process to acquire and develop meaning schemes, while experts already possess these meaning schemes, which means that their processes become more automated when facing new problematic or uncertain situations (Paas & Van Merriënboer, 1994).

2.6.4 Entrepreneurial knowledge

Entrepreneurial knowledge involves different types of knowing related to entrepreneurship (Johannisson, 1991; Ronstadt, 1985). These types of knowing can be linked to four learning categories commonly discussed within educational research; declarative knowledge (know-what), procedural knowledge (know-how), conditional knowledge (know-when and why), and contextual awareness (know-who). By making distinctions between different types of knowing in terms of what, how, when, why, and who, it becomes possible to tailor learning activities in entrepreneurship education.

A main emphasis in entrepreneurship education has been the development of know-how (Johannisson, 1991; Ronstadt, 1985), which concerns an understanding of how to use the knowledge one possesses in new ways (Hickman, 1992). This notion of how is more clearly discussed by Vermunt (1996, p. 27), who claims that "teaching how to learn and think independently" has become a factor of increased importance in higher education. This view has also impacted on how entrepreneurship education has been organized, where the introduction of experience-based pedagogy changed the focus from teaching declarative knowledge that concerned facts about entrepreneurship from a mainly theoretical perspective using the lecture format, to stimulating procedural knowledge (Gielnik et al., 2015; Johannisson, 1991; Sexton & Bowman, 1984) and conditional knowledge (Lindh, 2017; Neck & Greene, 2011).

The use of procedural knowledge has sought to develop entrepreneurial skills by engaging student entrepreneurs in learning through experience (Dhliwayo, 2008; Gundry & Kickul, 1996). The increased attention to procedural knowledge has been stimulated by past assumptions on action (e.g., Johannisson, 1991; Sexton & Bowman-Upton, 1984) and contemporary methods such as the logic of effectuation (Lackéus et al., 2016; Neck & Greene, 2011), lean start-up (Harms, 2015), and design thinking (Daniel, 2016), which have further promoted an

experiential perspective on skills development when educating student entrepreneurs (Mandel & Noyes, 2016).

However, voices have also been raised favoring and arguing for the development of conditional knowledge to generate insights on why and when, by means of engaging student entrepreneurs in reflective thinking to make sense of the experiential methods and activities they perform (Deacon & Harris, 2011; Neck & Greene, 2011; Williams Middleton & Donnellon, 2014), and to become self-regulated learners (Lindh, 2017). In addition, contextual awareness termed know-who (Johannisson, 1991) has also been considered important when educating student entrepreneurs. This involves developing networking abilities, and collaborative as well as communicative skills facilitated by means of mentor-mentee dyads (Hägg & Politis, 2017; Radu Lefebvre & Redien-Collot, 2013), and team learning (Hytti, Stenholm, Heinonen, & Seikkula-Leino, 2010). However, because entrepreneurship as a subject relies to a large degree on problem solving, it is important to bear in mind that the cognitive capacity of novices is limited compared to experts (Sweller, 1994).

The learning process in experiential education relies on the use of experience to develop knowledge. However, this process is highly dependent on student entrepreneurs' factual knowledge and reflective thinking abilities to transform raw experience into entrepreneurial knowledge. In this learning process, the connection to cognitive load theory may be useful for enhancing our understanding of how student entrepreneurs transform experience into entrepreneurial knowledge. Cognitive load theory argues that humans accumulate knowledge through the development of meaning schemes (Paas & Sweller, 2012; Sweller, 2015b). These meaning schemes, also known as schemata, consist of the accumulated knowledge structures that represent what an individual knows about the physical, mental, or social world (Alexander et al., 1991). Novices' development of meaning schemes occurs through controlled processes that are slow, serial, and effortful (Paas & Van Merriënboer, 1994; Sweller, 1994). Such controlled processes are flexible and open to analytic reflection, but their efficiency depends on the individual's mental load capacity. Developing schemas is important, as they act as cues for individuals in terms of what they can expect in different situations. Individuals are in this respect likely to recognize a problem when reality and schema do not match (Schunk, 2012).

2.6.5 The student entrepreneur

The student entrepreneur is a key actor in an experiential education framework. Although learning might appear in various constellations including multiple actors, such as peers, teachers, mentors, and other actors within and outside of the education, it is primarily the student entrepreneur who learns and develops

knowledge through transforming previously held perceptions of the world, also expressed as changing one's meaning schemes (Mezirow, 1990). In this respect, the student entrepreneur's cognitive knowledge is altered as a consequence of the learning process. As student entrepreneurs have limited prior entrepreneurial knowledge in comparison with expert entrepreneurs, their learning will be affected by their ability to use previously developed meaning schemes for solving problems in entrepreneurial situations (Sweller, 1988). The development of meaning schemes is connected to cognitive load, as it directs the individual's ability to solve complex problems. The development of meaning schemes occurs through moving from a controlled process of acquiring knowledge toward an automated process of developing expertise in a field (Paas & Sweller, 2012). Therefore, in order to avoid the risk of cognitive overload, effective and thoughtful pedagogical methods are needed to stimulate students' development of new or modified meaning schemes.

2.6.6 The entrepreneurial educational context

It is important to consider the entrepreneurial educational context in order to fully understand how student entrepreneurs learn entrepreneurship through education. In this respect, previous research has fallen short in providing a systematic understanding that considers the relationship between the student entrepreneur, the systematic learning process, and the educational context, as in combination, these influence how student entrepreneurs develop entrepreneurial knowledge. In this regard, learning in educational settings implies a structure and system that support the learning process, which need to be considered to understand how and why knowledge is developed in this specific setting (Roberts, 2015). In entrepreneurship education it is recognized that learning not only involves an individual undertaking, but also develops through transactions with stakeholders, such as peers, facilitators, mentors, and the entrepreneurial educational context. In previous studies these transactions have been discussed in terms of networking abilities together with collaborative and communicative efforts for developing know-who abilities and know-how skills (e.g., Heinonen & Poikkijoki, 2006; Honig, 2004; Johannisson, 1991). In this respect, it becomes important to acknowledge the influence that these stakeholders may have on student entrepreneurs. These concerns have been considered in entrepreneurship education by means of action learning and problem-based learning (Pittaway & Cope, 2007b; Rae, 2009; San Tan & Ng, 2006). The insights from these two approaches are that we gain new perspectives on our ideas through transactions with others, where the surrounding context either creates or diminishes the possibilities of learning. It could therefore be argued that the educational context of

entrepreneurship education consists of different stakeholders, both internal and external, that have major influence on students' learning.

2.7 The interplay of knowledge and the importance of reflective thinking

The tentative model of experiential entrepreneurship education focuses on how student entrepreneurs develop entrepreneurial knowledge that involves declarative (know-what), procedural (know-how), and conditional (know-why and when) knowledge, as well as contextual awareness (know-who). Although the terminology in the area of knowledge consists of many more terms, it has been argued that the first three hold for all types of knowledge, whether content, linguistic, or any other type (Alexander et al., 1991). The three categories of knowledge together with contextual awareness are not necessarily developed together, but in order to develop entrepreneurial knowledge it is necessary to consider all three types of knowledge and contextual awareness when designing learning activities in experiential entrepreneurship education.

Based on the above discussion on different forms of knowledge, the framework suggests that in the learning process reflective thinking is the means for transforming the rawness of a primary entrepreneurial experience into entrepreneurial knowledge. The developed entrepreneurial knowledge is then used in future primary experiences. In order to generate entrepreneurial knowledge, different pedagogical methods have the potential to stimulate reflective thinking in conjunction with the educational context that the transactive educational process entails.

2.8 The influence of the tentative model on the empirical studies

Based on the theoretical framework, three empirical studies for understanding the generation of entrepreneurial knowledge were conducted. The empirical studies have different aims, focused on different types of pedagogical methods for generating entrepreneurial knowledge.

In the first empirical study, formal mentorship as a pedagogical method to stimulate entrepreneurial learning is focused on by capturing how different types of knowing (Johannisson, 1991) are developed between an expert (the mentor) and a novice (the student entrepreneur). The purpose of the study is to examine how

formal mentorship as a pedagogical method facilitates learning for students in experiential entrepreneurship education. The mentorship study focuses on understanding how mentorship as a pedagogical method supports the student entrepreneur in an experiential entrepreneurship education.

The second empirical study focuses on collaborative learning through explicit and deliberate study groups, where the aim is to understand how peer-to-peer learning develops entrepreneurial knowledge. To understand how study groups serve as a pedagogical method to stimulate entrepreneurial knowledge, literature on both cognitive load theory and experiential education is used to grasp the process, while literature on peer learning is employed to analyze the empirical material. In the analysis of the study group sessions the reversal effect from cognitive load theory (Kalyuga et al., 2003) is considered to develop an understanding of the process.

Finally, the third empirical study focuses on understanding how the student entrepreneur develops reflective thinking and how this reflective ability influences the generation of entrepreneurial knowledge. This study draws on literature from both experiential education, mainly on how to develop reflective thinking (Dewey, 1910), and from cognitive load theory (Sweller et al., 2011) as the learning activity in the form of reflective learning diaries was tailored to provide extensive guidance in the early stage and then tone down the guidance when the student entrepreneur grasped the learning activity. Later stage guidance on the learning activity has more of a motivational character to keep encouraging the student entrepreneurs to engage in reflective thinking.

3. Research design

As with all research, this dissertation has been affected by the author's overall view of how to conduct research, as well as a number of decisions on methodological issues. These decisions have implications for how the results should be understood, as they developed in line with a certain way of viewing the world and are not to be seen as absolute truths, but as guidance for how to approach knowledge development in experiential entrepreneurship education. In the following section my philosophical stance will be discussed, followed by my research process (section 3.2), including summaries of the four appended papers, the methodological decisions made in my studies (section 3.3), and my methodological considerations in the empirical studies (section 3.4). This is followed by methodological reflections on conducting research on learning (section 3.5), reflections on a multidisciplinary approach (section 3.6), and finally my dual role as a researcher and instructor (section 3.7).

3.1 Philosophical stance

3.1.1 Pragmatism – its meaning

In this dissertation I have adopted a pragmatic approach (Hickman, 1992) for understanding how learning through entrepreneurial experience is transformed into entrepreneurial knowledge. Pragmatism was developed by Charles Sander Peirce in the late 19th century and further advanced by William James and John Dewey. Pragmatism is an American philosophy that is built around experience and the experimentalist view on how to conduct research. The core idea behind pragmatism rests within the pragmatist maxim, which is a rule for clarifying the contents of hypotheses by tracing their practical consequences (James, 1975). Pragmatism is an epistemological method for clarifying concepts and hypotheses, and is by nature close to empiricism due to its attention to experience (Dewey, 1906, 1908; James, 1907). However, the pragmatic approach is built upon logic, where theories based on an initial doubt guide subsequent inquiry in an effort to advance our understanding by resolving the doubtful situation and making it

understood (Dewey, 1938). This makes pragmatism a philosophical approach that is future oriented (Peirce, 1905) and asks what-if questions, as knowledge is provisional and subject to change based on future experiences (Elkjaer, 2009).

A main sign of my pragmatic approach is my doubt (Peirce, 1905) concerning the basic assumption of action orientation when learning entrepreneurship within an educational setting by means of experiential learning. This doubt, which has developed through multidisciplinary reading, is also related to the old philosophical dispute regarding body and mind, where I have followed the reasoning of Dewey (1938) and Freire (1970) concerning not separating body and mind when attempting to understand how learning is developed into knowledge. To obtain new insights on my doubt concerning the basic assumption of action orientation, four studies were conducted and a theoretical framework developed. The four studies in this dissertation do not follow a specific methodological tradition. Instead, they focus on portraying different processes, as they are considered tools for achieving the overall purpose, and therefore do not conflict with the view on how to conduct research on which this dissertation is based.

3.1.2 Pragmatism from a methodological perspective

In line with Peirce (1905), the pragmatic approach argues for the application of abductive reasoning, where the point of departure is doubting the current course of action. Abductive reasoning is concerned with developing hypotheses or propositions based on doubting current practice (Peirce, 1905), which are then examined through deductive or inductive methods to generate new insights that either validate or lead to modification of the proposed hypotheses or propositions. In this respect, abductive reasoning from the perspective of Peirce takes place in the discovery phase where theories are generated that can guide the research and settle the initial doubt (Frankfurt, 1958).

In accordance with a pragmatic approach, the tentative model developed in chapter two serves as the discovery phase of my abductive process, which is then examined through the empirical studies appended to this dissertation, leading to the modified conceptual framework discussed in chapter four. This demonstrates my pragmatic view of theories as instruments, which are to be put to work by examining them either deductively or inductively (Dewey, 1958; James, 1975; Peirce, 1992).

In this dissertation I firstly developed an initial doubt through multidisciplinary reading about learning and education, complimented by a systematic review of how research on pedagogy in entrepreneurship education has evolved. Through these two parallel processes I developed insights that cast a doubt on the assumption of action orientation as a guide for learning in entrepreneurship education. To remedy this doubt, I developed a tentative model synthesizing

educational theory to fulfil the body and mind dialectics discussed as the balance between action and reflective thinking. The tentative model guided my empirical studies by addressing the transactive process through studying three pedagogical methods. Each pedagogical method has been examined using theories suitable for the purpose of each study. The study on expert-novice learning makes use of literature on knowledge development. The study on peer learning addresses communicative and collaborative learning, while the study on reflective thinking makes use of literature discussing how reflective thinking is developed.

3.1.3 How my pragmatic approach affected the individual studies

Although the theoretical framework in this dissertation is an ongoing abductive process of development, the initial streams of literature emanate from pragmatism, in particular from the writings and theorizing of John Dewey. As entrepreneurship education as a scholarly domain has been closely tied to pragmatism (Kyrö, 2015), the roots for understanding how it should be taught likely rest within theories of a pragmatic nature, especially as the various experiential learning theories adopted in entrepreneurship education are grounded in progressive education. Hence, the antecedents for tailoring a learning process and building a tentative model are inspired by a pragmatic approach.

Looking back on study one, there is a clear connection to a pragmatic approach in terms of understanding the general pedagogical development in order to gaze toward possible future paths (James, 1975). One of the main signs of a pragmatic approach is future orientation, where the research process is built on a perplexing doubt that develops into a hypothesis or proposition, which needs to be understood (Dewey, 1910; Peirce, 1905). Through conducting the systematic review of the field my understanding and problematizing of action orientation developed into an argumentation in favor of a counterbalance by means of reflective thinking.

The empirical papers have their foundation in paper one and the tentative model in chapter two. The tentative model should be seen as an instrument that is open to modification if it is realized in empirical inquiries that it does not justify its intentions (Hickman, 1992). Study two, the mentorship paper, focuses on how learning in an expert-novice relationship develops, which also addresses the importance of how the surrounding context might affect the student entrepreneur. Using a pragmatic approach, this study builds on a Deweyan view of continuity and the progressiveness of change that takes place in a learning process. Study three, the peer-learning paper, discusses collaborative and communicative learning, which takes into consideration the fact that learning is a dialectic process between the individual and her/his environment (Dewey, 1916a, 1946). Study four focuses on the development of reflective thinking on an individual level and builds upon Dewey's (1910) theorizing on the importance of developing reflective

thinking when engaging in a learning process based on experiencing. This paper considers the core of the Deweyan pragmatic approach by developing further understanding of the balance between action and reflective thinking, termed by Dewey (1938) the logic of inquiry.

All three empirical papers focus on different aspects considered important for developing entrepreneurial knowledge in relation to the tentative model (chapter two). The point of departure of all the empirical studies is how student entrepreneurs learn through their experiences in education. This was further elaborated on in chapter two that focused on understanding how learning in a transactive educational environment stimulates the development of different types of knowledge when engaging in experience-based pedagogy emanating from a Deweyan perspective on learning through experience. The empirical studies are inspired by the pragmatist tradition of the dual meaning of experience, where both the act and the thought are considered important for understanding the world we live in and act upon. This duality makes the pragmatist view on experience something more than the mere physical behavior of trial and error (Biesta, 2007), as it includes the aspect of judgment and reasoning through reflective thinking (Dewey, 1910, 1938).

3.2 Research process

3.2.1 Pre PhD journey

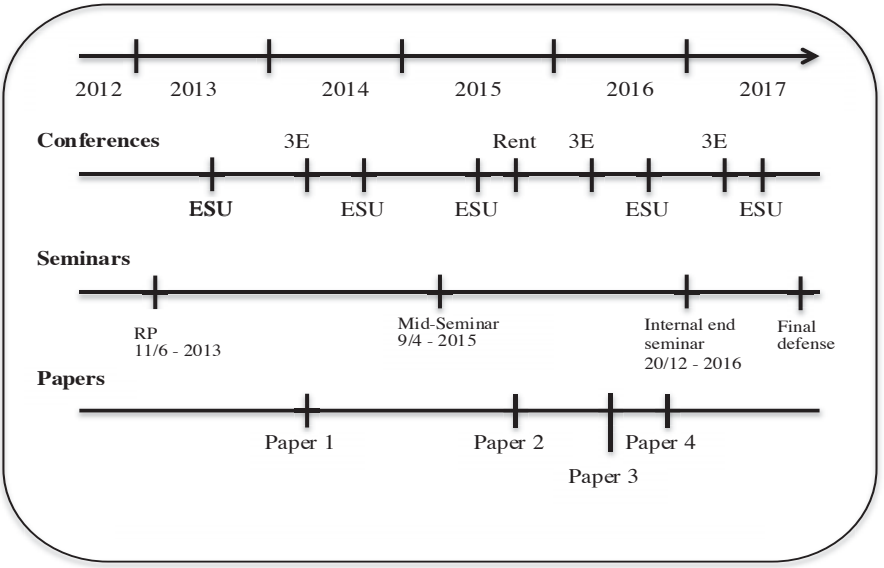
My journey as a PhD candidate began in the fall of 2012, but my preparation for it started in 2011 as a part time project assistant in a project on Entrepreneurial Universities. During my time as a project assistant I gained a first insight into the world of research, which led me to apply for another project assistant position at the Sten K Johnson Centre for Entrepreneurship. During this time I had the opportunity to elaborate on and read about entrepreneurship in general, but also to search for a potential angle for a PhD topic. At first I became interested in trying to understand the role of metacognition in decision-making, where I attempted to grasp how one could develop student entrepreneurs' metacognitive ability. Although an interesting topic, I always ended up in the area of reflective learning, as the complexity of studying metacognitive abilities during education rested to a great extent on an understanding of reflective learning. I therefore turned my attention to pedagogy and adult learning theory in an effort to understand how student entrepreneurs could develop entrepreneurial knowledge through experience-based pedagogy, supported by factual knowledge and reflective thinking. In this process I also became interested in various types of knowledge

and how they play different roles when students engage in a learning process. The three types of knowledge highlighted in this dissertation brought me close to my initial focus on metacognition, as conditional knowledge plays an important role in the development of metacognitive ability.

3.2.2 My PhD journey: The studies conducted and the rationale for my decision

In the fall of 2012 I became a PhD candidate. During the five years of PhD studies I conducted the four studies included in the dissertation and five additional studies. I performed a systematic literature review on the field of entrepreneurship education, accompanied by in-depth reading of educational literature and experience-based pedagogical literature. The systematic literature review together with my reading in the field of entrepreneurship, cognitive load theory, educational science, and experiential education served as a foundation for the development of chapter two and the tentative model on which the three empirical studies were based. My research process and the different papers, seminars, and conferences attended are presented in Figure 3.1.

Figure 3.1 Research process



During the five years I attended three different conferences where I presented my papers, both the four included in my dissertation and the five not included. I have attended the ESU (European Summer University), which is a doctoral summer course where PhD students, mainly from Europe, who are conducting entrepreneurship research, interact and present their current research. In addition, I have also attended and presented my research at the 3E conference, which is a European conference solely focused on discussing current research on entrepreneurship education. Finally, I also presented my research at the RENT conference, which is the oldest conference in Europe targeting entrepreneurship research. In the following, the four papers appended to this dissertation will be summarized and discussed in relation to the overall dissertation and the tentative model presented in chapter two. Paper one is a literature review, while papers two to four are empirical and build on the tentative model elaborated upon in chapter two. In Table 3.1 the four papers are briefly introduced.

Table 3.1. Appended papers

No	Paper	Author(s)	Subject / Relevance	Type / My role	Status
1	Evolution of pedagogy in research on entrepreneurship education: Reviewing achievements and addressing challenges	Hägg, G. Gabrielsson, J.	Provides a thorough understanding of how the implicit assumption about pedagogy has evolved toward experience-based and constructivist learning	Systematic literature review / First author 70/30 contribution to the paper	Submitted to *International Small Business Journal*.
2	Formal mentorship in experiential entrepreneurship education: Examining conditions for entrepreneurial learning among students	Hägg, G. Politis, D.	Provides insights on how mentorship serves as a support for student entrepreneurs in the course of a highly experiential learning process and the type of knowledge developed	Empirical paper / First author 70/30 contribution to the paper	Published in 2017 as a book chapter in "*The Emergence of Entrepreneurial Behaviour*", Edward Elgar.
3	Learning from and through each other: A study of peer learning in experiential entrepreneurship education	Hägg, G.	Provides insights on how peers stimulate each other to develop new perspectives on their learning, thus creating a more open learning process	Empirical paper / Sole author	Presented at the 3E conference in Leeds, U.K, on 11-13 May, 2016.
4	The reflective novice entrepreneur: From habitual action to intelligent action using experience-based pedagogy as a vehicle for change	Hägg, G.	Provides early stage evidence that reflective thinking has an important role in developing entrepreneurial knowledge through experience-based pedagogy	Empirical paper / Sole author	Presented at the ESU conference in Lyon, France on 12-16 Sept. 2016 (Best paper award). Under review as a book chapter (ed. Fayolle).

3.2.3 Evolution of pedagogy in research on entrepreneurship education: Reviewing achievements and addressing challenges

Paper one was developed with the aim of creating a better scholarly understanding of how research on pedagogy in entrepreneurship education has evolved since the 1980s, when entrepreneurship research started to achieve recognition as a distinct academic field (Landström, 2010). The paper employs a configurative systematic literature review methodology, which seeks to inductively organize and arrange the evidence-based patterns that emerged from the analysis in a theoretically meaningful way. In the paper we analyze 334 articles published in 62 different peer-reviewed journals between January 1980 and July 2017. To synthesize the findings from the articles we developed and applied an analytical framework that centers on instructors (who), content (what), target (for whom), and teaching methods (how). The analytical framework builds on past scholarly contributions in entrepreneurship education (Fayolle & Gailly, 2008; Hindle, 2007; Johannisson, 1991), and on our view of pedagogy as being about the "interactions between teachers, students and the learning environment and learning tasks" (Murphy, 2008, p. 35). Our developed framework provides an analytical approach for understanding the basic pedagogical building blocks of entrepreneurship education, viewed through research that has been conducted and reported within the scientific community.

3.2.3.1 Results

We divide our analysis into two parts, one descriptive in accordance with our coding and one inductive that seeks to configure and synthesize the emerging patterns over the 37 year analytical timeline. In our descriptive analysis we show how the field of entrepreneurship education has emerged and become a distinct sub-field in the domain of entrepreneurship. Through the evolution of the research field it has become evident that scholarly debates on entrepreneurship education have moved from mainstream entrepreneurship journals to more education and field specific journals such as Education + Training, Industry and Higher Education, and the Journal of Entrepreneurship Education. We further show how research has moved from a focus on curricula design toward a student learning focus, which has implications for the increased emphasis on pedagogy that is further discussed and elaborated on in the configurative analysis.

In our configurative analysis we adopt the analytical framework to identify patterns of how the research discussions on the pedagogical building blocks have evolved since January 1980 until today. From our analysis we conclude that the scholarly discourse on pedagogy in research on entrepreneurship education has developed from teacher-guided instructional models in the 1980s toward more constructivist perspectives, where contemporary pedagogical discussions center on the theoretical and philosophical foundations of experience-based teaching and

learning. Two major observations have emerged from our analysis. First, our analysis suggests that scholarly debates on pedagogy and research on entrepreneurship education have continued to be regarded as interesting and relevant, highly valued not only by instructors and students, but also by policy makers. However, due to its interestingness it has also remained close to a practitioner perspective, which has compromised the building of academic legitimacy. Second, research on entrepreneurship education has increasingly adopted and implemented approaches embedded in constructivist and experiential learning in theoretical debates and empirical studies, which has created a high action orientation and focus on pedagogy.

As a result of these two significant observations we determined three potential challenges for the future of the field. Firstly, the legitimacy-relevance challenge of balancing between being close to practice and relevant, but at the same time strengthening and advancing the theoretical foundations to build legitimacy. The second challenge concerns the observed divide between research on entrepreneurship and research on entrepreneurship education, where there are few "bridging" scholars who contribute to both fields of research, implying limited knowledge transfer and theoretical integration, especially with regard to the lessons learned from entrepreneurship research and its implications for entrepreneurship teaching. Thirdly, we also consider the implicit assumptions pertaining to learning that have evolved since the 1980s as a potential challenge that might create a mono-paradigmatic view. In the light of the development of the field the basic assumption of experiential learning based on a constructivist perspective needs to be critically questioned to further advance our understanding of teaching and learning in higher education.

3.2.3.2 Relevance to the dissertation and input for theorizing

Paper one has created a stable foundation for understanding how the pedagogical discourse has emerged and evolved since the establishment of entrepreneurship education in higher education. This study has also provided an understanding of why there is such an implicit action orientation when conducting research on entrepreneurship education and the type of theoretical streams that are important to be aware of and acknowledge when conducting research on the topic of teaching and learning in entrepreneurship education. From the insights gained through conducting this study I started to theorize and problematize the basic assumption of action orientation by returning to the roots of early theorizing on learning through experience and broadening my view on how knowledge is developed in an educational setting. This has aided me when building my theory chapter and the tentative model for understanding the interplay between action and reflective thinking when engaging student entrepreneurs in learning entrepreneurship through experience-based pedagogy.

3.2.3.3 Process and status of the paper

During the early phase of my PhD studies I needed to increase my understanding of the entire field of entrepreneurship education, with specific emphasis on the pedagogical development. At the beginning of 2013 I started to conduct a systematic literature review together with Professor Jonas Gabrielsson, which was presented as a plenary presentation at the 3E conference in Turku, Finland in April 2014. The paper has since been developed and the number of articles included has been increased. It is currently submitted to International Small Business Journal. The literature review contextualizes the area in which my dissertation is positioned, but it also serves as an introduction to the three empirical papers together with the tentative model developed in chapter two. The tentative model has been presented as a conference paper at the ESU conference in Southampton, England in August 2015, where it won the best paper award.

3.2.4 Formal mentorship in experiential entrepreneurship education: Examining conditions for entrepreneurial learning among students

Paper two examines how formal mentorship facilitates learning for students in experiential entrepreneurship education. The aim of the study is to develop our theoretical understanding of how mentorship as a pedagogical method facilitates learning for students in experiential entrepreneurship education. The paper employs a diary-interview method (Zimmerman & Wieder, 1977), which seeks to explain how student entrepreneurs become involved and develop entrepreneurial knowledge through a mentor-mentee relationship. In the paper we analyze two sources of empirical material. First, the study is built upon longitudinal diaries that provided a process perspective on the mentor-mentee relationship. Second, the insights gained from the diaries and the process were used as a foundation for constructing a semi-structured interview guide for the follow-up interviews. The diaries were written between December 2011 and May 2012, and the follow-up interviews were conducted during fall and winter 2012/2013. The paper is built upon a multiple case study involving five mentor-mentee dyads, where we analyzed the student perspective. To synthesize the empirical material each mentor-mentee dyad was analyzed based on both the process found in the students' diaries and the insights gained from the follow-up interviews with the students. To further nuance the findings pertaining to the five mentor-mentee dyads, the different cases were compared and contrasted with each other. Based on the analytical cross-case process we found a number of key conditions that foster a beneficial mentor-mentee relationship, after which we developed a process model for understanding how to create conditions for enhancing learning among entrepreneurial mentees and the benefits gained from mentorship.

3.2.4.1 Results

In the study it is argued that there are certain conditions that must be present in the mentorship relationship. The analysis revealed three distinct conditions for developing a beneficial relationship in formal mentorship, which together led to the development of the process model that emerged from the study.

First, it became evident that building mutual trust is a main component for establishing a mentorship relationship where learning can be developed. Although the importance of trust is well established, it was strengthened when considering the context of being in a formal mentorship setting imposed by a third party, where the mentor and mentee do not know each other prior to the start of the relationship and where the mentee is obliged to open up in a very personal manner, sharing what to her/his mind is sensitive information about her/his business ideas.

Second, the mentee's expectations on the mentor's experience were an important trigger for developing the relationship, where industry and business experience was highly valued by the mentee. However, two important aspects influenced how well the mentee received and used the mentor's feedback and advice: the mentor's specific industry experience and the trust that was built at an early stage of the relationship. These two aspects influenced how much of the mentor's advice on start-up activities, such as development of the business idea and business plan, the mentee adopted, but also had an impact regarding feedback on more general issues concerning the mentee's personal learning process.

Thirdly, an important condition is the mentor's questioning ability, from which the students gained both personal and business advice. The advice was usually characterized by questioning feedback from the mentors, which served as a prerequisite for creating a reflective learning environment where the questioning provided both support and a way to trigger alternative perspectives.

Based upon these three critical conditions for creating a beneficial learning process we developed a process model built on four phases: a matching phase, a familiarization phase, an expert-novice learning phase, and a final harvesting phase. From the findings of this study, it seems fair to argue that entrepreneurial mentoring is both a viable and highly potent pedagogical method that can be used by educators and instructors to enhance the learning experience of students in entrepreneurship education.

3.2.4.2 Relevance to the dissertation and relation to the tentative model

Paper two has generated important insights on how to structure and facilitate support for student entrepreneurs in a learning process that demands a high degree of individual responsibility. It provides insights on how the mentor, by using her/his experience, acts as a bridge for understanding the interplay between theory and practice, thus creating room for reflective thinking and knowledge development. The insights gained from the study also relate to expertise literature

for understanding how student entrepreneurs can simulate prior experience through the mentor when developing entrepreneurial knowledge. In addition, the study provides insights pertaining to pedagogical design within an educational setting. In relation to the tentative model, this study indicates that the learning process comprises different parts that should be further nuanced when trying to understand how entrepreneurial knowledge is developed when learning through experience. In this sense the initial tentative model was not very specific on the subtle distinctions between the different pedagogical methods and their importance for the individual learner. Hence, the study provides insights for modifying and further clarifying student entrepreneurs' learning process in experiential entrepreneurship education.

3.2.4.3 Process and status of the paper

I started to develop a study on the role of mentorship in aiding student entrepreneurs. This paper, which is co-authored with Associate Professor Diamanto Politis, is built upon interviews and reflective diaries. I conducted the interviews during winter 2012-2013 based on insights gained from the diaries. The first draft of the paper was presented at the ESU conference in Lisbon, Portugal in August 2013, but has since been re-written and presented at the RENT conference in Zagreb, Croatia in November 2015, in addition to being published as a book chapter in the Edward Elgar publication "The Emergence of Entrepreneurial Behaviour". Although the idea for and the writing of the mentorship paper occurred before my tentative model, it still tries to illuminate a key aspect of the framework: how entrepreneurial knowledge can be developed in an expert-novice relationship.

3.2.5 Learning from and through each other: A study of peer learning in experiential entrepreneurship education

The purpose paper three is to analyze how student entrepreneurs share and develop entrepreneurial knowledge through peer learning. The focus on how entrepreneurship students learn from and through each other has increased as a result of the implementation of co-creation, team-based learning, and a shift toward a more experiential perspective on learning (e.g., Harms, 2015; Mueller & Anderson, 2014; Pittaway & Cope, 2007b). The study focuses on cooperative peer learning within an explicit and deliberate learning situation (Topping, 2005). Cooperative peer learning is an instructional method where students work together to reach a shared goal, with focus on developing collaborative abilities and communicative skills (Sharan, 2015; Topping, 2005). The paper employs a focus group method to analyze how student entrepreneurs develop entrepreneurial knowledge through the transactive process of peer learning in a study group

setting. The empirical material builds on five sessions based on different study group settings and was collected from the new venture creation program in Lund during fall 2015 through observational recordings of the different study group sessions, generating approximately 22 hours of recorded material. The observational recordings were complimented by additional empirics in the form of a collective feedback session that took place in January 2016, and an individual meta-reflection report written at the end of the program in June 2016. To analyze the material Nvivo was used to code and store the audio recordings. As the study is based on collaborative and communicative learning the analysis focused on the group level, although additional sources of empirical material were used to add the individual level in order to trace the impact of the study group as a pedagogical method.

3.2.5.1 Results

The study contributes some valuable insights on how to create a collaborative learning arena that might stimulate and develop multiple perspectives on specific topics and areas that student entrepreneurs need when learning entrepreneurship. It does so by analyzing five different settings that build on an instructional design principle termed the reversal effect (Kalyuga et al., 2003), which implies that guided instructions are needed when learners encounter new activities, but then faded out as the learner become more and more proficient in the specific activity. As a result of the analysis and additional insights from individual level, the main discussion and findings of this study concern the pedagogical method of using study groups as a tool to develop peer learning. To address the instrumental and communicative aspects of learning (Mezirow, 1996), evident in the analysis and discussion of this method, the pedagogical method comprises three phases: the what of peer learning that targets the settings, how the process looks, and why peer learning is important when engaging student entrepreneurs in the transactive educational process implied by experience-based pedagogy.

Firstly, the what of peer learning in relation to developing entrepreneurial knowledge is aimed at capturing how to build an educational setting where students can engage in knowledge sharing. Throughout the analysis the different settings with their different levels of instructions and topics generated a process of knowledge development that moved from highly structured activities to less structured activities and back to a structured process due to the newness of the final session. Over the course of this process the student entrepreneurs in the sample exhibited a willingness to learn and assume responsibility, which became apparent in the final session that employed a debate format, thus placing great emphasis on the students playing their roles and becoming actively involved.

Secondly, the how of peer learning in relation to developing entrepreneurial knowledge is best understood as a process of both generic and factual knowledge development related to the domain of entrepreneurship. The following insights

from two of the students illustrate how this specific study group setting creates a beneficial collaborative and communicative learning process over time.

> Through the study groups… I became more and more comfortable discussing with others and more open to other opinions; realizing that there can be more than one right answer" (Donna)… I admit that when presented with the two concepts, I was initially unsure if I actually understood the difference… the more we discussed, the more I realized that I was following a path of effectuation (Mia, Meta-reflection report, June 2016).

Thirdly, the why of peer learning for fostering entrepreneurial knowledge that became evident in this study targets how the study group setting provided opportunities for the student entrepreneurs to engage in individual reflection based on the sessions in which they participated. In this sense the peer learning setting served as input for the individual student entrepreneur when engaging in reflective thinking, but the pedagogical method is also a means of creating more equality among peers and fostering the students' ability to assume responsibility for their own learning, as it is through collaboration that this learning activity materializes.

All in all, this study has sought to empirically explore how peer learning creates one arena for knowledge development when involving student entrepreneurs in the highly transactive educational process implied by experience-based pedagogy.

3.2.5.2 Relevance to the dissertation and relation to the tentative model

Paper three brings important insights on how to further support the individual learning process that this dissertation seeks to explain through focusing on the balance between action and reflective thinking. It does so by nuancing the role of peers when learning through experience-based pedagogy, and how the learning process requires that peer learning becomes an active and explicit part when tailoring the pedagogical methods to create a fruitful learning process. In this respect the study has provided important insights on how parts of the transactive process work and how to theorize it in relation to the individual learning process that remains central for understanding how student entrepreneurs develop entrepreneurial knowledge in an education that adopts experience-based pedagogy. The dialectic interplay between the individual and group is made visible in the study in an important way that was not fully captured in the mentorship paper as it only focused on the student perspective of an expert-novice relationship. In this study on peers the focal point is the group perspective in order to understand how it facilitates the student entrepreneurs in their learning process. In relation to the tentative model, the study has provided insights on how transactions among peers generate an increased understanding of entrepreneurial phenomena that serve as input when the student entrepreneur engages in reflective thinking about the learning experiences to generate entrepreneurial knowledge.

3.2.5.3 Process and status of the paper

Following the tentative model from chapter two, Study three attempts to understand the role of peer learning and how it can enhance the individual perspective that learning normally entails. The study, which is sole authored, was presented at the 3E conference in Leeds, England in May 2016. It employs a focus group methodology based on observational recordings of the group discussions. In addition to this primary empirical material, individual student reflections and evaluations were used to triangulate the empirical material. The study seeks to explain how transactions between peers contribute to the development of entrepreneurial knowledge by enabling alternative perspectives on the learning process. At present the paper is being structured for submission to a journal.

3.2.6 The reflective novice entrepreneur: From habitual action to intelligent action using experience-based pedagogy as a vehicle for change

The aim of paper four is to analyze how reflective thinking serves as a means for transforming entrepreneurial experience into entrepreneurial knowledge within an experiential entrepreneurship education that uses venture creation as a learning vessel (Lackéus & Williams Middleton, 2015). The focus is on following the students' learning process and ability to develop reflective thinking. The study adopts a mixed-method approach based on a QUAL + quant design (Molina-Azorín, López-Gamero, Pereira-Moliner, & Pertusa-Ortega, 2012), where the qualitative method employing data in the form of longitudinal reflective diaries is dominant, complimented by a quantitative method consisting of a pre-, mid-, and post-survey on reflective thinking. In addition to these two sources, student grades where used to triangulate the data and to discuss the impact of the development of reflective thinking. The student entrepreneurs handed in their longitudinal reflective diaries every second week throughout the period of the one-year program. In total, 28 students from the new venture creation program in Lund made up the sample, and 459 diary entries were analyzed in conjunction with a pre-, mid-, and post survey. The maximum number of diary entries per student was 17, but some students did not hand in all 17, which affected the final graded assignment by deducting two points per missed diary. To analyze the data a qualitative directed content analysis (e.g., Hsieh & Shannon, 2005) was employed using a specially developed coding scheme consisting of four categories: habitual action, understanding, reflection, and critical reflection (Kember, McKay, Sinclair, & Wong, 2008). The four categories in the coding scheme were also the main constructs in the survey by Kember et al. (2000). The focus was to analyze the role of reflective thinking when student entrepreneurs go through a highly experience-based pedagogical process when learning entrepreneurship.

3.2.6.1 Results

The study provides a fair amount of support for the importance of fostering reflective thinking ability for developing entrepreneurial knowledge when adopting an experience-based pedagogy.

Firstly, in line with the four category analytical framework from Kember et al. (2008), which also constitutes the base for the pre-, mid-, and post survey of reflective thinking used in the study, a distinct pattern of how reflective thinking is developed among student entrepreneurs is discussed. From the qualitative directed content analysis (Hsieh & Shannon, 2005) it became evident that there is a highly unidirectional path when developing reflective thinking abilities in the educational setting, which is supported by the scant empirical research that exists on the development of reflective thinking (Leung & Kember, 2003; Phan, 2007).

Secondly, the coded diaries show a clear pattern and distinction between those student entrepreneurs who engage in developing their reflective thinking ability and those who fail to achieve a proficient level during the program. The main process for developing reflective thinking ability rests on grasping the learning activity at an early stage and gaining an understanding of factual knowledge that is used to make sense of learning experiences. A clear difference between the two groups emerged through the qualitative analysis in terms of how the reflective group of students developed understanding at an early stage of the diary writing process, which then served as input for more reflective thinking at the mid stage, and occasionally for critical reflection at the late stage of the learning process.

Thirdly, the qualitative analysis pattern is supported by the results of the survey and connected to the average grades among the student entrepreneurs. There is a negative correlation between habitual action and the other three constructs, but a positive correlation between understanding, reflective thinking, and critical reflection. The between group differences revealed by the results of the survey were smaller, which may be due to the fact that the students rated themselves. However, when considering the average grades it becomes evident that those students who develop their reflective thinking ability achieve higher grades. This indicates that reflective thinking is a means in this learning process, something that has been argued for in theoretical contributions for more than a century, although there are few empirical insights that illustrate how this process materializes.

Finally, based on the higher average grades among the reflective group it could be postulated that they acquired more entrepreneurial knowledge through the education. However, there is no evidence to indicate that their knowledge will be superior to that of the student entrepreneurs in the non-reflective group.

3.2.6.2 Relevance to the dissertation and relation to the tentative model

Paper four contributes early stage empirical evidence from both a qualitative and a quantitative perspective on the importance of developing reflective thinking

abilities when engaging in experiential entrepreneurship education that adopts experience-based pedagogy. The study also provides insights into the importance of acknowledging the student entrepreneurs' individual learning process, as the results from the analysis show clear differences among the students and their ability to develop entrepreneurial knowledge based on their level of reflective thinking. The study also gives insights for the initial tentative model and how the main individual learning process should be further nuanced and highlighted, as it remains the most important process to understand when tailoring pedagogical methods in entrepreneurship education. Although much research supports team learning, collaborative learning, other forms of situated learning, and sociocultural perspectives on how to develop pedagogical processes in entrepreneurship education, it is only on the individual level that we can understand whether or not students have grasped the learning activities and developed entrepreneurial knowledge. Despite the fact that most student entrepreneurs will be exposed to working in teams in their future professional careers, the educational process is still mainly an individual undertaking where knowledge construction differs between students.

3.2.6.3 Process and status of the paper

The paper, which is sole authored, won best paper award at the ESU conference in Lyon, France in September 2016. It addresses the main part of the tentative model, which is the individual learning process of developing entrepreneurial knowledge when learning through experience, and provides empirical insights into the proposed framework and logic of experiential entrepreneurship inquiry described in chapter four. This paper is currently under review for a book on entrepreneurship education edited by Professor Alain Fayolle.

3.2.7 Other studies emanating from the research process

During this research process I also developed and presented additional studies that have been influential in increasing my understanding of the phenomenon of entrepreneurship education and its relation to the entrepreneurial process, educational philosophy and theory, policy, and critical studies. The studies presented or published are:

- Book Chapter: Honig, B., Karlsson, T. & Hägg, G. (2013). The Blessing of Necessity and Advantages of Newness, Eds: Andrew Corbett & Jerome Katz, in Advances in Entrepreneurship, Firm Emergence and Growth, vol. 15
- Conference presentation: Hägg, G., & Schölin, T. (2014). Is entrepreneurship education crusading for the Holy Grail? Insights from Sweden. Paper

presented at the Nordic Conference on Small Business, Bodø, Norway (to be revised and resubmitted to Education + Training)

- Conference presentation: Hägg, G. (2015). Learning from Experience: Advancing the Learning-by-Doing Discussion to the Next Level in Entrepreneurship Research. Paper presented at the ESU Conference, Southampton, U.K.
- Conference presentation: Hägg, G. (2016). From liberal progressive education to neo-liberal enterprising self s - A policy perspective. 3E Conference – ECSB Entrepreneurship Education Conference, Leeds, U.K.
- Journal article: Hägg, G. & Kurczewska, A. (2016). Connecting the dots: A discussion on key concepts in contemporary entrepreneurship education. Education + Training, 58(7/8): 700-714.

3.3 Methodological choices: process data and triangulation

The studies in this dissertation all employ different methods for capturing how entrepreneurial experience is developed into entrepreneurial knowledge in entrepreneurship education. As an underlying logic to capture a learning process and the development of entrepreneurial knowledge, all three empirical studies take a process perspective, complimented by adopting methodological triangulation to capture how learning is promoted by the different learning activities (Cohen & Manion, 1994). By emphasizing three different pedagogical methods for understanding how to create a balance between action and reflective thinking they also accord with the transactional perspective necessary when developing knowledge in experiential education (Roberts, 2015). For the purpose of the dissertation the three empirical studies are a triangulation designed to understand how student entrepreneurs develop entrepreneurial knowledge by emphasizing the importance of reflective thinking.

I realize that the three empirical papers in this dissertation have limitations, as they do not capture the entire educational process depicted in my tentative model (chapter two). The empirical studies provide different views on knowledge development through this specific type of pedagogy, but none of them capture the entire educational process presented in the tentative model. Instead, the idea behind them is to illustrate different parts of this educational process and together they will hopefully demonstrate the usefulness of the proposed model for learning entrepreneurship through experiential entrepreneurship education, discussed in chapter four. Furthermore, my narrow approach to entrepreneurship education – experiential/action-based education – also reduces the reach of my findings, which

is an effect of focusing on experience-based pedagogy for understanding how to educate student entrepreneurs. This approach does not allow me to address the broader issues of entrepreneurship seen in the writings about enterprising pedagogy that aim to influence students' entrepreneurial skills on a broader societal level (e.g., Gibb, 1993; Jones & Iredale, 2010; Rae, 2010).

On a methodological level the dissertation has adopted multiple methods for understanding the phenomena of learning and knowledge development. The methods used have differed, but in all studies methodological triangulation has been applied to grasp the complexities that are evident when trying to capture and interpret learning in an educational context (Cohen & Manion, 1994).

The most explicit triangulation study is paper four, where the entire study was crafted using a mixed method approach. In paper two the methodological triangulation is built into the use of the diary-interview method that was applied to grasp how learning is developed in mentor-mentee dyads. In paper three the methodological triangulation was more in the nature of a construction to gain multiple views on what had actually been observed as progression in learning. In paper three the main analysis focused on understanding and interpreting what was developed in the study group setting, but individual meta-reflection reports were used to accentuate how the students perceived this form of collaborative learning, together with insights gained from the autumn semester evaluation of the program, thus giving an individual voice to the learning activity.

3.4 Methodological considerations regarding the empirical studies

In this dissertation I have conducted three empirical studies to address the importance of developing reflective thinking in connection with the action orientation in the field of entrepreneurship education and the foundations of experience-based pedagogy. Although there are many different studies that could have been conducted to grasp student learning in an entrepreneurial setting, I have chosen three specific settings: expert-novice learning, peer learning, and individual learning. The three settings are connected to prior insights on how to learn entrepreneurship and built upon discussions in experiential education research.

With regard to the study on expert-novice learning and the rationale behind the pedagogical method of mentorship, its relation to learning entrepreneurship has a fairly long history in the literature. From an entrepreneurial learning perspective it has been argued that using mentors to assist novice entrepreneurs is important in the early start-up phase (Deakins, Graham, Sullivan, & Whittam, 1998), where a more experienced entrepreneur provides entrepreneurial experience that the novice

entrepreneur lacks. The use of mentors has increased in entrepreneurship education (Bisk, 2002; Radu Lefebvre & Redien-Collot, 2013), but few studies have addressed what potential knowledge transfer this type of relationship can generate or how to develop conditions for a fruitful relationship. In relation to experiential education, the argument in favor of mentorship is based on the transactive nature of creating close connections to the surrounding environment, and as a way of transferring knowledge between a student and a facilitator (Itin, 1999; Roberts, 2012). Although mentors are not facilitators in the sense of organizing the education, they are seen as an expert resource that becomes a part of student entrepreneurs' learning process.

From the perspective of how to learn entrepreneurship, the rationale behind the use of peer learning by means of a study group setting has been to understand how collaboration among equals can create a beneficial learning environment that provides both a deepened knowledge of entrepreneurship as a phenomenon and collaborative skills. This also builds on the increased recognition of co-creation and team learning in research on start-ups. In relation to the underlying theoretical rationale of experiential education, the peer-learning study tries to capture one of the transactive phases seen as important for creating a beneficial experiential learning process. Although it does not specifically target the development of reflective thinking among individuals, it is a pedagogical method that stimulates the development of multiple perspectives on a phenomenon to enhance critical thinking (Gokhale, 1995), deemed important as input for the process of reflective thinking (Dewey, 1910).

In the final empirical study of this dissertation the individual learner is in focus. The rationale behind using reflective diaries is connected to the literature on learning through experience (Boyd & Fales, 1983; Gray, 2007; Hubbs & Brand, 2010), the antecedents of experiential education based on the thoughts of Dewey (1910), and his argumentation about the need for reflective thinking. Studying the student entrepreneur also builds on my view that to comprehend how learning is developed into knowledge, we have to understand it from an individual perspective, as individuals construct knowledge in different ways (Schunk, 2012) that usually do not resemble how another individual understood the same phenomenon, activity, or discussion that occurred in a learning situation. In relation to research on learning entrepreneurship, there have been many calls for developing entrepreneurs' ability to "learn how to learn" and to reflect upon the entrepreneurial activities they experience (Baron, 1998; Cope, 2003, 2005), thus highlighting the importance of reflection in entrepreneurship education (Neck & Greene, 2011). However, we still have scant evidence of how the process for developing reflective thinking looks and its effect when engaging student entrepreneurs in learning through experience.

3.5 Reflections on the multidisciplinary approach taken in the dissertation

As with all dissertations, choices and standpoints affect the process of going from the seed of an idea to a completed dissertation, and the present dissertation does not deviate on that point. At an early stage of the process it became clear that to adapt the phenomenon of experiential education to the entrepreneurship education context I needed to embrace a multidisciplinary approach to understand how it generates a learning process that results in valuable knowledge for entrepreneurship students. Based on my decision to use knowledge from multiple disciplines such as; experience-based pedagogy, adult education literature, learning theory including cognition and expert learning, entrepreneurship research including entrepreneurship education and entrepreneurial learning, I acknowledge that it has had implications for how I designed the dissertation and what I can achieve with it. Below I will outline both the strengths and the limitations of the approach that I have chosen for understanding this phenomenon.

Although a multidisciplinary approach has broadened my understanding on how learning, pedagogy, and entrepreneurship can be combined, it has also created challenges in positioning where and to whom I want to make my contribution. I now know that my scholarly target is to develop our knowledge base in the field of entrepreneurship education, but I still have to work on making my research understandable for those not acquainted with the different streams of educational and pedagogical research, which are seldom discussed in depth within the field of entrepreneurship education (e.g., Béchard & Grégoire, 2005; Fayolle, 2013; Kyrö, 2015). However, by combining these different disciplines I believe that my contribution to entrepreneurship education will have an impact on how we address the aspect of knowledge development and what role different types of knowledge play when educating student entrepreneurs. The development of my conceptual framework where I synthesize and go to the roots of experience-based pedagogy and the duality of experience might also be considered a contribution to understanding the interplay between action and reflective thinking when developing entrepreneurship education on the basis of experience-based pedagogy.

3.6 Reflections on duality as a researcher and instructor

When conducting research in an educational setting the instructor is usually part of the research process, which leads to an "insider perspective" where the instructor both implements the learning activity and is a co-constructor of the behavioral changes experienced by the learner.

Therefore, I also have to reflect upon my dual role in the development of this dissertation. In this duality I have not only played the role of a researcher, but have also influenced the empirical setting through my role as an instructor in various learning activities, which have been used as a main input in my studies. Although all empirical research creates observer effects that might bias the results obtained when collecting empirical material from the subjects being studied, my dual role not only has an observer bias, but also an instructor bias that warrants self-reflection on the findings of the dissertation. As my main empirical material consists of reflective diaries that the students wrote as a mandatory task during their studies, there are a number of aspects that need to be discussed when making claims on the basis of the empirical findings from these diaries.

Firstly, I designed and implemented the structure, instructions, and feedback sessions, which of course creates a dilemma in terms of how this empirical material has been tailored and how my influence on the students made them engage in completing the learning task of writing the diary. Although my interpretation is that I was the most suitable person to tailor and give feedback on the students' development of reflective thinking, I also shaped their view on how to reflect, which in a sense is biased toward my interpretation of how to develop reflective thinking. On the other hand, the bias has been formed by extensive reasoning from previous literature in the area of reflective thinking, where I endeavored to stay true to basic theorizing about the concept of reflective thinking and how it has been conceptualized within an educational setting (Boud et al., 1985; Dewey, 1910; Mezirow, 1990). While this does not guarantee the objectivity of my findings, arguments can be made in favor of the process. If I had not been in charge of structuring the diaries, providing instructions on how to approach the task, and giving feedback on the students' progression, it would have been ethically and morally wrong to just observe whether some students naturally developed their abilities and some did not. My dual role included moral decision making to promote student learning (Oser & Althof, 1993). The moral position taken was one of inclusion, which is supported by previous research on developing reflective thinking that generally agrees on the importance of clear instructions before the task, guidance and feedback as formative assessment, and clear structures in the early phase (e.g., Dyment & O'Connell, 2011; Dyment & O'Connell, 2010; Grossman, 2009; O'Connell & Dyment, 2011).

Secondly, having a dual role should not only be envisioned as the influencer role in the learning process biasing the learners; it can also be seen as a strength as it provides deep-seated insights of the students I studied. By following the students and interacting with them, I gained knowledge on a personal level that made it possible for me to develop my own understanding about their previous experiences in a way that would not have been possible when only observing them from a distance. The approach taken is inspired by current constructivist ideals on how to understand the development among individual learners, but also includes a reality

check by being open to additional perspectives on knowledge development. By arguing for a balanced view on learning, where previous insights on student learning from different educational perspectives are included, I believe that a sense of moral and ethical judgment has been part of my research process when developing my reasoning about how to learn through experience in education. The different choices I have made also influenced my analysis, especially in the more subjective aspects of my studies, but to capture how learning is developed I have tried to aggregate my findings from the individual perspective to a group perspective, and by using different sources of data and theory.

Thirdly, concerning the other forms of empirical material used in this dissertation, I have played different roles. I implemented the study group setting, which of course involves some bias that could be discussed in relation to my interpretations and conclusions. But, in the same vein as in the discussion on the reflective diaries, there are pros and cons with the dual role I have played. I do see some disadvantages in orchestrating the various learning activities that I discuss in my studies, but at the same time the opposite could also be true. What if I had not introduced these learning activities or further developed existing learning activities? Would that have led to less learning? This could have been solved through conducting studies employing an experimental design. However, I consider that conducting experiments on students when they are in a learning situation also has a moral and ethical dimension about which I am uneasy. I could have tested the effect on reflective learning by having half of the group write diaries or participate in peer-learning through study group sessions and then tried to map the effect, but in my opinion that would be unethical in terms of the other half of the group. The aim of this dissertation is not to test learning effects or the use of experimental designs in learning, but to generate a deeper understanding of how students develop entrepreneurial knowledge when learning through experience in experiential entrepreneurship education. Instead of adopting experimental designs, I have grounded my instructional designs in existing theories on learning and knowledge development from different streams of educational literature.

4. Discussion and contribution of the dissertation

In the final chapter I will address and discuss the specific and general contributions of this dissertation. The first section (4.1) includes an overview of the four studies, which is followed by section 4.2 where I answer the two research questions underlying this dissertation. Section 4.3 comprises a detailed discussion of the modified conceptual framework emanating from the findings of my empirical studies. This is followed by a discussion about the various implications emanating from the dissertation in relation to theory (section 4.4), teaching and learning (section 4.5), and future research directions (4.6). The chapter ends with the conclusion of the dissertation (section 4.7).

4.1 The main contribution of the dissertation

In the following discussion I will address the main contributions emanating from the different studies and discuss how they have guided the answers to my two research questions.

4.1.1 Overview of the four appended studies

In my dissertation four studies contributed to fulfilling the overall purpose of understanding how reflective thinking might serve as a means when student entrepreneurs transform experience into entrepreneurial knowledge, as well as answering the two research questions posed in the first chapter. The two questions were: (1) how can different pedagogical methods support the development of reflective thinking in experiential entrepreneurship education? (2) Why do these methods develop reflective thinking, and why do they create a balance between action and reflective thinking?

The four studies all contributed different insights that have generated implications for theory, teaching, and learning, as well as for future research in entrepreneurship education. In the following discussion I will address the main

findings of each study, which will guide the answers to my two research questions. However, the contributions from the findings also played an important role in the modification of my conceptual framework. To provide an overview of the studies, Table 4.1 presents the purpose of the study, the empirical base, and the main findings.

Table 4.1: Contributions of the appended papers

Paper	Purpose of the study	Empirical base	Main findings
1	To conduct a systematic literature review with the objective of creating a better theoretical understanding of how pedagogy in research on entrepreneurship education has emerged and developed since the 1980s.	334 peer-reviewed articles discussing entrepreneurship education from 1980-2017. No exclusion based on journal ranking (62), instead inclusion to cover a broad view of the development.	Three main challenges are discussed: (1) increasing legitimacy while maintaining relevance, which addresses the importance of building stronger theoretical foundations. (2) The conversational divide that addresses how a divide has emerged over time between entrepreneurship and entrepreneurship education, resulting in limited cross-fertilization between the fields. (3) The implicit assumption on learning, which has created a strong action orientation and emphasis on experiential learning, guiding our view on how to educate in entrepreneurship education.
2	To identify core conditions in the mentor-mentee relationship that facilitate entrepreneurial learning for students in experiential entrepreneurship education, implying that an important aspect of such understanding is how the mentor-mentee relationship unfolds over time.	Longitudinal learning journals (written from December 2013 to June 2014) and follow-up semi-structured interviews (conducted in winter 2014/2015). Multiple case study including 5 students from the 2013/2014 program.	The findings indicate that psychosocial support is important in the early stage, where openness, motivation, and commitment on the part of the mentor create trust. Furthermore, the development of different types of knowing was seen in the analysis, but it was dependent on the mentees' expectations and the mentors' previous entrepreneurial experience. Additionally, the questioning ability of the mentor provided opportunities for the student entrepreneur to generate new perspectives to use when reflecting.
3	To analyze how student entrepreneurs share and develop entrepreneurial knowledge through peer learning.	Five study group sessions, where each session included 4-5 groups, complimented by insights from the students' final meta-reflection report, and a mid-way evaluation on the program.	Peer learning increases the students' communicative abilities and collaborative skills, which at the same time generates deeper self-insights about one's learning process. It also contributes multiple perspectives on the entrepreneurial phenomenon that serve as input when transforming primary entrepreneurial experience into entrepreneurial knowledge through the process or entrepreneurial inquiry.
4	To analyze how reflective thinking serves as a means for transforming entrepreneurial experience into entrepreneurial knowledge within an experiential entrepreneurship education, by following the students' learning process and their abilities to develop reflective thinking.	Longitudinal reflective diaries, written every second week during the year under study and a pre-, mid-, and post-survey on reflective thought. Total cohort; 28 students from the 2015/2016 program. No missing data in the three surveys.	The development of reflective thinking has been described as a unidirectional process, where initial understanding on a factual knowledge basis serves as input for the student to make connections between the conditions underlying the primary entrepreneurial experience and additional perspectives to update her/his knowledge and retool, which is made possible by developing reflective thinking ability.

From an individual perspective each study contributes to research on entrepreneurship education, but combined, they fulfil the overarching purpose of the entire research project and answer the research questions. The systematic literature review provides insights on how the field of entrepreneurship education has largely drifted away from the entrepreneurship domain and established itself as a sub-field. In view of this separation, my co-author and I present three challenges for future research, which address the legitimacy issue of rigor and relevance, the low cross-fertilization between entrepreneurship and entrepreneurship education, and the implicit assumptions embedded in dominant pedagogical approaches. The systematic literature review creates a foundation for how to continue to problematize within research on entrepreneurship education. It also highlights the need to identify pedagogical methods for stimulating reflective thinking due to the acknowledged action orientation and dominant emphasis on experiential and constructivist learning theories.

In this respect the systematic literature review has been important and guided me in the development and design of my three empirical studies addressing different pedagogical methods acknowledged as important for understanding the development of reflective thinking. Through the findings from my systematic literature review I developed an initial doubt about action orientation, and it also provided insights on the disconnection to educational literature. These two implications drawn from the study led me to further explore the literature on knowledge development, cognitive load theory, and experiential education when developing my tentative model and the three empirical studies. The contributions from the three empirical studies will be further nuanced when answering the two research questions in section 4.2.

4.2 Research questions

In this dissertation I have elaborated on the balance between action and reflective thinking when educating student entrepreneurs. To guide the research process I posed two research questions that I will answer in the following two sections. The answers to the research questions that guided this dissertation should be understood as progressions of previous research on how and what to teach based on my empirical findings. The answers aim to address why the balance between action and reflective thinking is important when studying how student entrepreneurs develop entrepreneurial knowledge when learning through experience.

4.2.1 How can different pedagogical methods support the development of reflective thinking in experiential entrepreneurship education?

To answer my first research question, the findings from my systematic literature review serve as a foundation for addressing the importance of how pedagogical methods can support the development of reflective thinking. The systematic literature review focusing on the pedagogical evolution in research on entrepreneurship education shows how experiential learning theories have had a major influence on the development of how and what to teach in entrepreneurship education. In addition, the study addresses a challenge with respect to the implicit assumptions embedded in dominant pedagogical approaches. The implicit assumption in entrepreneurship education is based on an early action orientation and emphasis on how practicing entrepreneurs learn by doing (e.g., Cope & Watts, 2000; Johannisson, 1991; Ronstadt, 1985). Through these insights literature on learning through experience provided a foundation for realizing the importance of developing and including reflective thinking ability in the experiential learning process (e.g., Boud et al., 1985; Dewey, 1910; Kolb, 1984; Roberts, 2012). Insights from the literature focusing on how entrepreneurs learn also underlined the importance of reflective thinking in the learning process (Cope, 2003, 2005, 2011; Deakins & Freel, 1998; Politis, 2005b). However, neither of these two streams of literature provided me with a coherent understanding of how reflective thinking is developed in an experiential entrepreneurship education. To deepen the initial insights gained from my systematic literature review and the additional reading on learning through experience and studies on how entrepreneurs learn, I posed the question of how different pedagogical methods could support the development of reflective thinking in experiential entrepreneurship education.

Various pedagogical methods have the potential to develop students' reflective thinking. This dissertation has focused on three pedagogical methods that are commonly discussed in the educational literature and studies on entrepreneurial learning.

Firstly, based on previous research on entrepreneurial learning (Bisk, 2002; Sullivan, 2000), we have gained knowledge of the potential influence of mentorship on entrepreneurs' ability to develop reflective thinking (Cope, 2005; Deakins et al., 1998). The role of mentors and their ability to bridge the gap between theory and practice has been proven in mentorship literature (Kram, 1985; Ragins & Kram, 2007), but the question of how mentorship can serve as a pedagogical method in entrepreneurship education to form a bridge between theory and practice has received limited attention (e.g., Gimmon, 2014).

Secondly, the literature on experiential education has provided valuable insights on the importance of transactions with peers (Roberts, 2015), which led me to the literature on peer learning that acknowledges its importance for developing deep learning, as well as collaborative and communicative skills (Topping, 2005; Webb,

1989). Deep learning is achieved when students move beyond a surface level of merely memorizing facts and concepts, and instead engage in discussions and problematizing within a subject (Bhowmick, Chandra, Harper, & Sweetin, 2015; Biggs & Tang, 2011; Vogel-Walcutt, Gebrim, Bowers, Carper, & Nicholson, 2011). The importance of peer learning and its focus on developing deep learning, as well as team learning requiring collaborative and communicative skills, is also connected to the literature on entrepreneurship education and has been acknowledged as essential for preparing student entrepreneurs for their future professional life, both when starting up a venture and when entering into employment (Harms, 2015; Hytti et al., 2010).

Finally, in order to understand the development of reflective thinking on an individual level, it has been argued in the educational literature that the writing of reflective diaries is a key pedagogical method (Dyment & O'Connell, 2010; Grossman, 2009; Kember et al., 2008). Reflective diaries as a pedagogical method have also been promoted in entrepreneurship education (Deacon & Harris, 2011) as a means to understand student development and encourage self-insight (Deacon & Harris, 2011; Neck & Greene, 2011; Neck, Greene, & Brush, 2014; Williams Middleton & Donnellon, 2014).

The three different pedagogical methods all contribute to the development of reflective thinking. However, they play different roles, which are manifested at different stages in the transformation of entrepreneurial experience into entrepreneurial knowledge. Mentorship acts as a bridge between theory and practice, where the expert-novice relationship seeks to overcome limitations in entrepreneurial knowledge when learning through experience. Peer learning aims to create an arena where the heterogeneity of previous knowledge among student entrepreneurs serves as a foundation for obtaining additional perspectives on the tasks experienced in education. Reflective diaries seek to connect the dots between theory and practice to develop deep learning and generate entrepreneurial knowledge through synthesis.

The most obvious pedagogical method that supports student entrepreneurs in developing their reflective thinking ability is the writing of reflective diaries. The main strength of the reflective diary is the development of awareness of reflective thinking as a rigorous and orderly way of thinking, implying that the student entrepreneur moves from a surface level to a deep level of learning. This pedagogical method also makes the student entrepreneurs conscious of reflective thinking by tailoring the reflective diary through guiding questions, explicit guidance in the early stage of the process, and continuous individual feedback (Boud et al., 1985). Making student entrepreneurs aware of their thinking by engaging them in writing reflective diaries relates well to previous arguments on how to make entrepreneurs think about their thinking (Cope, 2005; Cope & Watts, 2000). By making the students more conscious of their thinking, they might become more inclined to open up in terms of better understanding failures in their

learning (e.g., Dewey, 1910), something that has been argued to be of importance for practicing entrepreneurs (Cope, 2011; Politis & Gabrielsson, 2009). The openness to potential failures builds on previous research in which it was stated that reflective thinking is initiated through a perplexing feeling of doubt regarding the current course of action (Dewey, 1910). By developing an ability to engage in reflective thinking, student entrepreneurs are more open to addressing their thoughts and feelings when consciously making decisions throughout their learning.

However, in order to remedy the limitation of lack of previous entrepreneurial knowledge when educating student entrepreneurs by means of experience-based pedagogy, it is not sufficient to merely focus on the orderly process of writing individual reflective diaries, as to develop reflective thinking ability student entrepreneurs have to engage in a dialectic interplay (Dewey, 1910), which today takes place through mutual transactions between the student and her/his peers, facilitators, mentors, and educational environment (e.g., Roberts, 2015). The transactive nature of this process of entrepreneurial inquiry (discussed in more detail in section 4.3) to support the development of reflective thinking is best captured in my mentorship and peer learning studies. The two empirical studies addressing the transactions between expert-novice and peers provide additional support for how student entrepreneurs create substitutes for their limited prior entrepreneurial knowledge that provide additional perspectives when reflectively thinking about the tasks experienced. As a pedagogical method mentorship offers the student entrepreneurs opportunities to complement their existing knowledge base with expertise and experience provided by the mentor (Deakins et al., 1998). By having a mentor who acts as a sounding board, the student entrepreneur gains a bridge between theory and practice (St-Jean & Audet, 2012; Sullivan, 2000), where the mentor can help by providing questioning insights that may help the student entrepreneur to connect the dots when developing reflective thinking (Hägg & Politis, 2017). However, the value of a mentor-mentee relationship is highly dependent on the student entrepreneur and how she/he makes the most of the relationship to close the gap between theory and practice. This can be achieved through opening up and building a trustful mentor-mentee relationship.

On the other hand, the pedagogical method of study groups provides an arena where peers can jointly discuss and elaborate on the connection between theory and practice (Topping, 2005). As in most cases the composition of the group is heterogeneous, the student entrepreneur gains access to a vast amount of prior knowledge through her/his peers. This implies that as a pedagogical method, study groups provide valuable opportunities for students to open up for new insights and perspectives on their present experiences and those they will have to face in the near future. Through opening up for additional perspectives and new insights, the study group setting can generate deep learning (Biggs & Tang, 2011), which has been argued to be important when engaging in reflective thinking to synthesize

and develop knowledge for the future (Neck & Greene, 2011). In addition, the study group setting also provides an arena in which to develop collaborative skills and communicative abilities (Gokhale, 1995; Webb, 1989), which are important for engaging in future transactive processes, such as start-ups.

To conclude, the three pedagogical methods studied in this dissertation all contribute to our understanding of how reflective thinking ability is developed and has become important for student entrepreneurs during their experiential entrepreneurship education. However, as discussed above, the three methods play different roles in the transactive learning process (Itin, 1999; Roberts, 2015) to develop reflective thinking ability. The transactive learning process (e.g., Itin, 1999; Roberts, 2012), which I have labeled 'the process of entrepreneurial inquiry', has been shown to be important for developing additional perspectives, which Dewey (1930) terms the connecting principles or conceptual theories (tools) that are used to develop knowledge through experience.

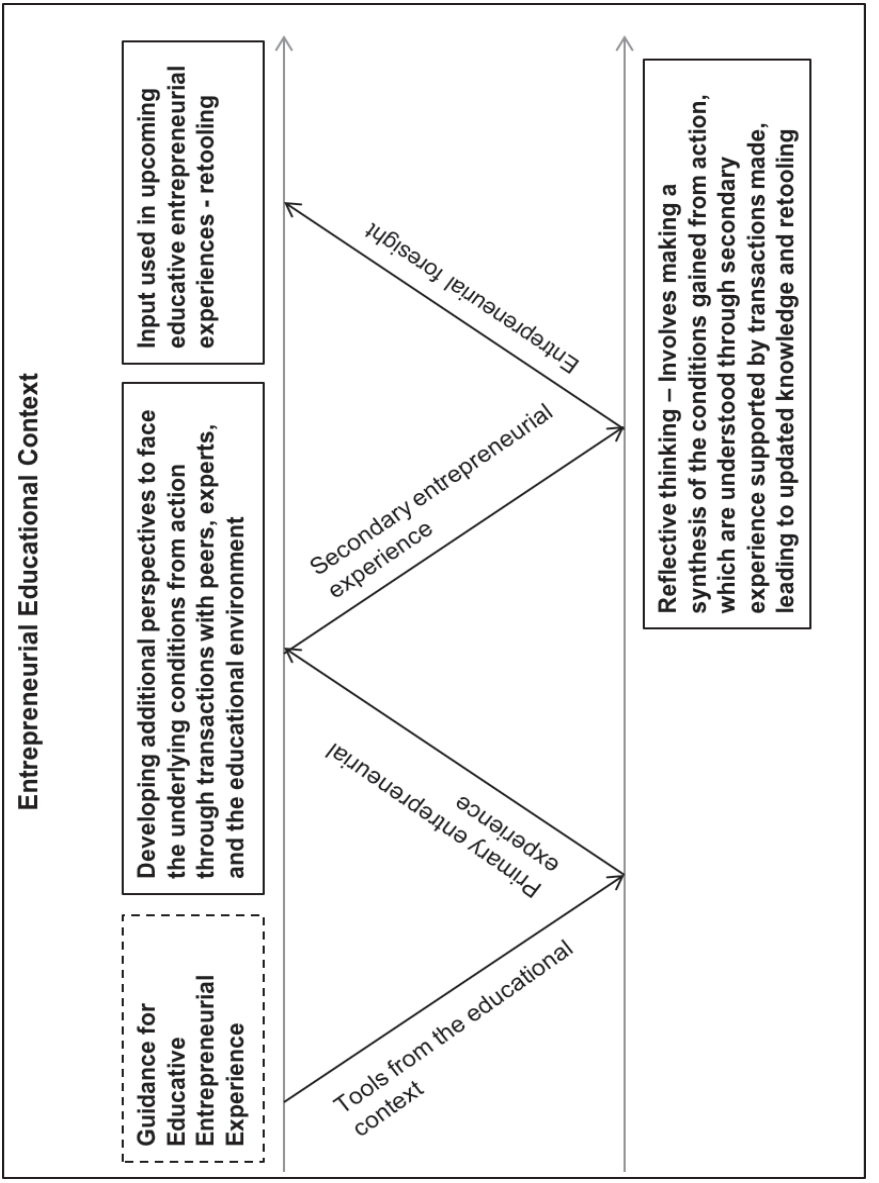
4.2.2 Why do these methods develop reflective thinking, and why do they create a balance between action and reflective thinking?

The empirical findings reveal how different transactive processes between the student entrepreneur, her/his peers, and mentors provide essential understanding for the development of reflective thinking ability. Although the empirical studies have demonstrated how different pedagogical methods can facilitate the student entrepreneurs' ability to develop reflective thinking, the question of why these pedagogical methods develop reflective ability and create a balance between action and reflective thinking is best captured through a modified conceptual framework that explains the relationship between student, systematic learning process, and educational context.

The modified conceptual framework in model 4.1 addresses the relationships between the pedagogical methods employed within the systematic learning process, the influence of the entrepreneurial educational context, and the student entrepreneur involved in this process, who acts within this context through the various transactions that take place. The underlying answer to why these three pedagogical methods concurrently develop reflective thinking lies in the different contributions they make to creating opportunities for student entrepreneurs to develop reflective thinking ability.

It has been argued that reflective thinking is a transformational means that starts from experience (Boud et al., 1985; Kitchner & King, 1990; Mezirow, 1991). However, a prerequisite for engaging in reflective thinking is the ability to connect principles or conceptual theories (Dewey, 1930) to understand the experience and to generate knowledge development.

The empirical studies in this dissertation have provided answers to why they concurrently contribute to the development of reflective thinking in experiential entrepreneurship education. It has been acknowledged that previous conceptions on developing reflective thinking ability are based on the assumption that learners need to possess prior knowledge as otherwise there is nothing to draw on to clarify the experience (e.g., Dewey, 1910, p.12). The assumption on prior knowledge is understandable, but this limitation can be overcome by adding transactive processes when student entrepreneurs engage in developing reflective thinking ability. In this transactive learning process the implementation of expert-novice learning and peer learning may serve as a bridge for the student entrepreneur who might lack different types of knowledge needed in the domain of entrepreneurship. In addition, these two pedagogical methods compliment the orderly process of developing reflective thinking ability, which has been previously treated as a highly individual process based on interactions between the individual and the environment (Dewey, 1916a). The three pedagogical methods concurrently create a transactive process that connects the body and mind to balance action and reflective thinking when developing entrepreneurial knowledge. In this respect, implementing pedagogical methods that aid student entrepreneurs in understanding the various learning experiences they encounter will enable the construction of entrepreneurial knowledge. As previous research has argued for a balance between action and reflective thinking (Freire, 1970), I have sought to deepen our understanding of how this balance can be achieved within entrepreneurship education. This was inspired by the implicit assumption pertaining to action orientation that I became aware of through my systematic literature review, which has guided how to educate in entrepreneurship education and supported the implementation of experience-based pedagogy.



Model 4.1: The process of entrepreneurial inquiry

4.3 Explanation and contributions of the modified conceptual framework

Based on the tentative model and the empirical findings a modified conceptual framework entitled 'the process of entrepreneurial inquiry' is presented. The conceptual framework (Model 4.1) builds on the logic of inquiry (Dewey, 1938), cognitive load theory (Kirschner et al., 2006), experiential education literature (Roberts, 2012), and entrepreneurship research in conjunction with the empirical insights. Together, these different theoretical streams and the empirical findings have been synthesized in an effort to further position the initial tentative model that served as a foundation for understanding how student entrepreneurs learn through experience within experiential entrepreneurship education. The conceptual framework primarily seeks to explain how the process of developing reflective thinking ability can balance the implicitly assumed action orientation, discussed in my systematic literature review (study 1), when educating student entrepreneurs who lack prior entrepreneurial knowledge.

Reflective thinking ability has been acknowledged as essential for engaging in the process of entrepreneurial inquiry, which is in line with studies on entrepreneurship education (Lindh & Thorgren, 2016; Neck & Greene, 2011; Pittaway & Cope, 2007b; Williams Middleton & Donnellon, 2014) and educational literature at various levels (Boud & Walker, 1998; Phan, 2008, 2009; Rodgers, 2002).

The conceptual framework contributes to existing research on entrepreneurship education by addressing the relationship between the student, the systematic learning process, and the influence of the entrepreneurial educational context. Although there have been various arguments advocating the fact that entrepreneurship is inherently unpredictable, thus making a process perspective on entrepreneurship inadequate for educational purposes (Neck & Greene, 2011), based on my theorizing and empirical findings I argue that thoughtful pedagogical methods create opportunities for engaging student entrepreneurs in a systematic process that prepares them for dealing with the unpredictability and uncertainty that the entrepreneurial process entails. As education per se is bound in time and space, and includes multiple pedagogical methods, learning goals, and learning outcomes that students need to achieve in order to graduate, the process perspective is indeed teachable. However, prior understanding of how student entrepreneurs will construct and develop entrepreneurial knowledge is unpredictable, due to the inherent differences in how individuals construct knowledge (Schunk, 2012). Or as Fayolle (2008, p. 326) argues on teachability in entrepreneurship education, "it is indeed possible to teach and educate people in entrepreneurship. However like in any discipline it is impossible to guarantee a

priori the success of many courses of action". Hence, when making claims on what students have to learn, how to learn, why to learn, when to learn, and for which results in entrepreneurship education (e.g., Fayolle & Gailly, 2008), we must also acknowledge the different conceptions of learning that exist. One views learning as an unsystematic process that takes place outside of academia, while the other considers it a systematic process that education builds on.

A pattern of how reflective thinking ability is developed within experiential entrepreneurship education emerged from the empirical studies. The ability to engage in reflective thinking is highly dependent on a structured process that moves the learner from a surface to a deep level of learning, which implies a process that seeks to make reflective thinking conscious (Boud et al., 1985). This movement is made possible by tailoring different pedagogical methods that stimulate student entrepreneurs' ability to engage in the process of entrepreneurial inquiry. The systematic process of reflective thinking was acknowledged through the empirical findings on the development of reflective thinking (study 4). Throughout this process the student entrepreneurs developed reflective thinking ability by engaging in a unidirectional pattern of first gaining an understanding about entrepreneurship on a factual level. Hence, in the early stage, guidance and pre-exposure (Kalyuga et al., 2003; Sweller et al., 2011) to entrepreneurship was important for creating a foundation from which they could engage in the primary entrepreneurial experience. However, to overcome the dichotomizing of either theory or practice, the amount of guidance and pre-exposure to entrepreneurship from a factual perspective can be provided through thoughtful implementation of pedagogical methods in the experiential learning process. The factual understanding based on pre-exposure that builds a foundation of conceptual theories important for engaging in reflective thinking (Leung & Kember, 2003; Phan, 2007) can be complimented by the different transactions that take place in this educational process. These different transactions build on the insights gained from my two studies discussing the importance of expert-novice learning (study 2) and peer learning (study 3).

In the modified conceptual framework guidance is still acknowledged as an important phase, as it plays a dual role in the learning process. The guidance phase can relate to instructional clarity of the pedagogical method, but also to pre-exposure to factual knowledge in the subject-domain of entrepreneurship. However, this phase in the model ceases to play an important role when student entrepreneurs have grasped the pedagogical method guiding the learning activity, which is in accordance with the literature on the reversal effect in learning (Kalyuga et al., 2003). Additionally, to overcome the lack of prior knowledge in a domain, the empirical studies revealed that the expert-novice dyad acts as a bridge, where having access to more experienced entrepreneurs provides additional perspectives and questioning insights. By gaining additional perspectives and questioning insights, student entrepreneurs can engage in recognizing the

conditions underlying the primary entrepreneurial experience. Through recognizing the underlying conditions of the experience, aided by the various transactive processes they encounter, student entrepreneurs move to the phase of secondary entrepreneurial experience, which focuses on making the experience understandable. By making the entrepreneurial experience understandable the student entrepreneur can then join the dots between the experience and connecting principles or conceptual theories (tools), based on synthesizing theory (mind), practice (body), and reflective thinking ability. This synthesis enables the student entrepreneur to either extend existing entrepreneurial knowledge or develop new entrepreneurial knowledge, known as entrepreneurial foresight, to be used in future entrepreneurial actions. Engaging in consecutive entrepreneurial experiences in a learning process build what has previously been termed educative experience (Dewey, 1916a), where the different experiences are interlinked and related to each other to build entrepreneurial knowledge.

Educating student entrepreneurs by means of the process of entrepreneurial inquiry is intended to develop entrepreneurial foresight to deal with uncertainty (Dewey, 1910). As we know from previous research that entrepreneurs have to be able to deal with constantly changing information asymmetries (Shane & Venkataraman, 2000; Venkataraman, 1997), they need to continually evaluate and re-evaluate how to best proceed in their entrepreneurial activities. In the knowledge intensive world of today, being able to update one's knowledge and re-tool has never been more important. Hence, educating student entrepreneurs through the process of entrepreneurial inquiry could create initial abilities regarding how to face present and future entrepreneurial situations. An important aspect of being able to evaluate and re-evaluate one's situation is reflective thinking. The empirical studies showed that guidance through clear instructions, individually focused feedback, a specific diary format, worked examples to engage the student in the learning process, and deliberate practice (Ericsson et al., 1993) are all important for developing reflective thinking ability among student entrepreneurs. However, the generation of educative experiences also needs to be supported through transactive exchanges (Roberts, 2015) with peers, facilitators, and mentors, as well as the educational environment.

Relating back to my initial discussion of the problem in chapter one and Baron's (1998, p. 291) argumentation that "what we want, ultimately, is not entrepreneurs who are paralyzed into inaction by efforts to conduct totally logical assessments of all possible risks and benefits, but rather ones who pause and reflect sufficiently to increase the chances that they – and their societies – will prosper", I am not arguing that reflective thinking should dominate the educational process. However, when engaging student entrepreneurs in a learning process based on experience, where they have to make decisions about what is essential in the experience, reflective thinking is the means that transforms the experience into knowledge. In addition, through my empirical findings it has become evident that

the ability of reflective thinking to transform experience into knowledge can be developed with the aid of different pedagogical methods.

Engaging student entrepreneurs in the process of entrepreneurial inquiry to acquire entrepreneurial knowledge will hopefully lead to the internalization of the developed knowledge that can become automated over time (Paas & Van Merriënboer, 1994). Although previous research on entrepreneurship education has provided support for the importance of reflective thinking when engaging student entrepreneurs in learning through experience, in this dissertation I have provided new insights on how student entrepreneurs develop reflective thinking ability, and how this is facilitated by different pedagogical methods. In this way, I have also provided knowledge that highlights the importance of integrating the student entrepreneur, the systematic learning process, and the entrepreneurial educational context when designing and tailoring educational processes that aim to develop entrepreneurial knowledge.

4.4 Implications for theory

In the following I will address three implications for theory that emanated from this dissertation. I do not claim that they are completely novel, as they build on previous and present advances made by other scholars in the field of entrepreneurship education. Nevertheless, I believe that the dissertation has generated some novel insights on how to think differently when educating student entrepreneurs and in what situations reflective thinking can aid aspiring student entrepreneurs when engaging in the entrepreneurial process.

The first implication for theory concerns how we consider experience and the need to acknowledge its dual nature when studying student learning in entrepreneurship education. Based on the findings in my systematic literature review and multidisciplinary reading on experiential learning theories both with regard to adult learning behavior and educational processes, I have highlighted the importance of seeing experience as a dual concept including the primary entrepreneurial experience realized through the entrepreneurial action. The entrepreneurial action creates the conditions for engaging in the secondary entrepreneurial experience, which initiates reflective thinking necessary to develop knowledge. Previous research in entrepreneurship education has acknowledged both parts of experience, but largely emphasized one over the other (Hägg & Kurczewska, 2016). Primary experience has been connected to the importance of introducing action into the learning process (Johannisson, Landstrom, & Rosenberg, 1998; Pittaway, Missing, et al., 2009; Sexton & Bowman, 1984), while secondary experience has been closely tied to the importance of making room for reflective thinking (Deacon & Harris, 2011; Lindh & Thorgren, 2016; Neck &

Greene, 2011; Williams Middleton & Donnellon, 2014). The main difference in previous studies has been the discussion of reflective thinking on a highly individual level as a compliment to action, or the view of action as a catalyst for engaging in an individual process of reflective thinking. However, to the best of my knowledge, there is little research that addresses the duality of experience and its implications for understanding learning through experience in entrepreneurship education. Although insights on the importance of both have been described, the empirical findings in this dissertation together with the modified conceptual framework provide an understanding of how action and reflective thinking are connected through primary and secondary experience, creating a balance in the learning process. The dissertation also provides a comprehensive understanding of how reflective thinking is developed and how it facilitates students to transform their experiences into knowledge.

The second implication for theory concerns the integration of different types of knowledge. In relation to the expertise learning literature (Ertmer & Newby, 1996), reflective thinking could aid in regulating how a learner strategizes for future learning. However, mastering reflective thinking requires the development of different types of knowledge. As it has been acknowledged in previous research and empirically shown in this dissertation, factual knowledge (declarative) and skills (procedural knowledge) constitute a good foundation for developing conditional knowledge (e.g., Ertmer & Newby, 1996; Schunk, 2012), which takes place through synthesis. Therefore, to develop reflective thinking ability, an integrative approach to knowledge is needed, which considers the interplay between declarative, procedural, and conditional knowledge (Alexander et al., 1991), and contextual awareness (Johannisson, 1991). Although the different types of knowledge can be developed one by one, domain-specific knowledge is developed through the interplay of the three types. Such interplay requires not only an understanding (declarative) of the domain, but also skills (procedural) in how to use the domain knowledge, and finally an ability to regulate why and when (conditional) to use the knowledge and skills. It was demonstrated in the empirical studies that the various pedagogical methods developed different types of knowledge. The empirical studies on mentor-mentee dyads and peer study-groups provide both contextual awareness and declarative as well as procedural knowledge, which are essential when developing conditional knowledge through reflective thinking. The different types of knowledge were described in the early literature on entrepreneurship education by Ronstadt (1985) and operationalized by Johannisson (1991), further addressed by Williams Middleton and Donnellon (2014), and in entrepreneurial learning literature by Rae and Carswell (2001), as well as by Politis (2005a). However, the interplay between them for the development of entrepreneurial knowledge has been rarely addressed in previous literature. In the early development of the field specific types of knowledge were recommended (e.g., Johannisson, 1991) for stimulating skills and promoting the

development of entrepreneurial behavior. Later on the distinction between the types was further discussed and the focus on knowing why was acknowledged (e.g., Williams Middleton & Donnellon, 2014). The fact that the importance of addressing the interplay of the different types of knowledge in the development of domain-specific knowledge in entrepreneurship is less evident in previous works might be connected to the so-called disconnection between entrepreneurship education and education science (Béchard & Grégoire, 2005; Fayolle et al., 2016; Pittaway & Cope, 2007a; Rideout & Gray, 2013). Hence, in this dissertation I show how integrating research from educational science could help to advance research on entrepreneurship education, especially by addressing the importance of different types of knowledge for the development of domain-specific knowledge in entrepreneurship.

Finally, the third implication concerns the importance of treating student entrepreneurs as distinctively different from practicing or expert entrepreneurs when developing pedagogical methods to create a beneficial learning process in the educational setting. In this dissertation I have strongly argued for the need to acknowledge the inherent difference between a novice learner and an expert when tailoring and developing learning processes for student entrepreneurs. In this argumentation I have primarily taken inspiration from the literature on cognitive load theory (Sweller, 1988, 2015a, 2015b), but also from the literature on expertise learning and educational science (Alexander, 1992, 2003; Alexander & Judy, 1988; Ertmer & Newby, 1996), which provide arguments for the different processes utilized by a novice and an expert when learning through experience. In entrepreneurship education research, the implementation of and argumentation for an entrepreneurial method to explain how entrepreneurial knowledge is developed might gain new input from this dissertation for how to position the method perspective in relation to the systematic process of education (Paas & Van Merriënboer, 1994; Roberts, 2015). The discussion of an entrepreneurial method relates to the development of abilities that entail effectual logic when educating student entrepreneurs, a logic that is associated with expert entrepreneurs (Sarasvathy, 2001, 2008). As effectuation builds on the logic of control rather than prediction (Sarasvathy, 2003), the process of entrepreneurial inquiry to develop entrepreneurial foresight could be seen to conform to the focus on control and being aware of one's situation. However, they have completely different points of departure, where the logic of effectuation starts from an understanding of how expert entrepreneurs make decisions (Sarasvathy, 2008), while the process of entrepreneurial inquiry starts from how novice learners develop abilities to act and make decisions in a world of uncertainty.

4.5 Implications for teaching and learning entrepreneurship

The findings in this dissertation, which emanate from creating a balance between action and reflective thinking, have some implications for teaching and learning, especially when adopting experiential learning activities. In the following discussion I will first address the implications derived from the dissertation of tailoring learning activities from a teaching perspective. I will then address the implications of developing reflective thinking from a learner perspective based on an instructional approach in experiential entrepreneurship education.

Conducting research in an educational setting and at the same time being a member of the teaching staff creates insights not only from a learning perspective, but also from a teaching perspective. At least three implications for teaching can be derived from this dissertation.

Firstly, knowing the antecedents of your students is a very good start for tailoring teaching. Although it is self-evident and has been previously addressed, this basic premise is easily overlooked when teaching becomes routinized or when the educational process is largely driven by a traditional lecture-based format. Knowledge of the antecedents of your students is especially important when teaching entrepreneurship through experience-based pedagogy. Knowing your students also provides you with the preconditions for building appropriate pedagogical methods for the students at their level of proficiency in the subject-domain. Having prior knowledge about the students also plays a major role when deciding on the amount of guidance they will need to understand the why of the various learning activities. This relates to the thoughts of Roberts (2015) and his design principle of making the invisible visible for students, as well as to the advances made in cognitive load theory, where engaging students in complex tasks might be counterproductive in terms of achieving the intended learning outcome (Sweller, 2015a, 2015b).

Secondly, the integration of different streams of educational research has deepened the understanding of how to tailor instructions, while working with both guidance and worked examples has been beneficial for comprehending the highly implicit process of learning through entrepreneurial experience. Hence, by balancing insights from two largely different perspectives on teaching, experience-based pedagogy emanating from educational philosophy (Itin, 1999), and cognitive load theory emanating from experimental psychology (Sweller, 2016), the findings from the empirical studies show how important tailored instructions are for involving students in various learning activities that have their foundation in different pedagogical methods. Through tailoring instructions and making students understand the meaning and importance of each learning activity, the students are better able to relate the learning activities to the overarching learning

process on a course or program. Making the student aware also creates intrinsic motivation, as the student can see the value that she/he will gain by engaging in the different learning activities to achieve the end goal of completing the course or obtaining the final degree on a program.

Thirdly, the decision on how to engage students in learning through experience will also influence how to structure the learning activity. In modern society, the importance of teamwork has increased, which is mirrored in entrepreneurship where it is argued that the development of new start-ups is more and more likely to occur on a team level (Hmieleski, Cole, & Baron, 2012; Hytti et al., 2010; Klotz, Hmieleski, Bradley, & Busenitz, 2014). Therefore, the need for the ability to engage student entrepreneurs in learning through joint efforts has increased, which also has implications for how to structure learning activities that not only consider how the individual learns, but also how individuals can learn how to collaborate. In cognitive load theory it has been argued that letting students work together increases the perceived ability to solve the task (Kirschner, Paas, & Kirschner, 2011a, 2011b), which also decreases the mental load of each participant (Kirschner, Paas, & Kirschner, 2009). Hence, insights from two largely distant views on how to develop knowledge through education contribute important instructional and pedagogical insights pertaining to how we can tailor and structure learning activities both for individuals and groups. By knowing that students could solve highly complex tasks if grouped based on differences in prior knowledge, we could overcome early stage problems of letting student entrepreneurs engage in highly un-systematic learning processes. This is especially important in view of the fact that students seem to perceive experience-based pedagogy as highly open and un-systematic when first encountering this student-centered learning process.

The above is a discussion about how to teach and tailor learning activities, but the question still remains: How do we know if the student has developed entrepreneurial knowledge when engaging in learning through experience? In this respect, on the basis of my empirical results I argue that the ability to develop reflective thinking is essential, as it is through this process that students are able to combine theoretical understanding and practical execution to develop new insights that they did not possess before engaging in the learning activities. Through my empirical studies I have argued that the main learning process is highly individual and based on the student entrepreneurs' ability to develop reflective thinking. However, in order to create opportunities for student entrepreneurs to develop knowledge through reflective thinking, collaborative and communicative forms of learning (mentor-mentee dyad and study groups) might facilitate an understanding of the subject domain and the learning experiences.

The importance of developing reflective thinking has been discussed in entrepreneurship education literature (Jack & Anderson, 1999; Lindh & Thorgren, 2016; Neck & Greene, 2011; Williams Middleton & Donnellon, 2014), but few

attempts have been made to seek the conceptual depth of how such ability might be developed (Hägg & Kurczewska, 2016). In this dissertation I have focused on how reflective thinking can be developed, and analyzed how different pedagogical methods can facilitate and inspire student entrepreneurs to develop their reflective thinking ability. The empirical data based on reflective learning diaries provided insights on the highly systematic structure when developing reflective thinking (discussed in paper four). This systematic structure has been deemed important for making students engage in the effortful and consecutive ordered process, which emanates from my interpretation of the logic of inquiry to develop reflective thinking ability (Dewey, 1910, 1938). My interpretation of this highly systematic structure is best viewed in the five different questions on which the diary is based, where it moves from a surface level to a deep level and then back to a surface level to connect with the future. Hence, the diary structure moves from the past to the present and into the future. But to make this possible, systematic and individualized feedback has been shown to be essential, together with explicit instructions and a worked example in the early stage in order to motivate the students to engage in developing reflective thinking. By tailoring the activity in this way the invisible becomes visible and the students understand the why of the learning activity, making it into a conscious process that facilitates the development of reflective thinking ability.

4.6 Implications for future research

As with all dissertations the research process does not end with the completion of this manuscript. Over the years of studying the phenomenon of entrepreneurial learning within an educational setting I have developed a conceptual framework and conducted a number of empirical studies to generate deeper knowledge and understanding of how the balance between action and reflective thinking is created. However, as I write the final chapter on this matter, I realize that there are still ongoing debates that need further scholarly attention for understanding students' learning in entrepreneurship. In the following I will address four avenues that need our scholarly attention to better explain the complexities involved when tailoring and developing learning activities and pedagogical methods targeting student entrepreneurs.

Firstly, by positioning and conceptualizing how we study entrepreneurial learning within the educational setting we can engage in building a stronger intellectual foundation for entrepreneurship education research. Building on the conceptual framework and previous calls for developing a stronger theoretical foundation (e.g., Fayolle, 2013; Rideout & Gray, 2013), I have in this dissertation tried to deepen the theoretical understanding of how learning is developed into

knowledge in experience-based pedagogy. I have merely scratched the surface and provided some empirical insights on how student entrepreneurs learn through experience. There are still many uncertainties that need to be addressed regarding how we tailor learning activities, what philosophical tradition of learning serves as our point of departure, and how we capture progress in learning with the perspectives and theories we apply. In this regard, I really believe that much work remains to be done. For example, today we are arguing for a more student-centered perspective in learning (Robinson et al., 2016), where a constructivist perspective and experience-based pedagogy have been deemed important for learning entrepreneurship (Hägg & Kurczewska, 2016; Löbler, 2006). However, what type of constructivist perspective, dialectic, endogenous, or exogenous (Moshman, 1982) should we apply in our studies, and how does the applied perspective capture learning? And why are the theories or perspectives that we apply adequate for capturing entrepreneurial learning in the educational setting? In this regard there is a wide range of theories in mainstream educational literature that we could take advantage of to position what we are doing, what we claim to find, and how we structure learning activities to capture the intended learning and knowledge development sought in relation to entrepreneurship.

Secondly, positioning and conceptualizing how we study entrepreneurial learning might also create new avenues for assessing entrepreneurship education, which also increases the opportunity of studying the effects of engaging students in learning entrepreneurship in higher education. It is important to develop measures for assessing and evaluating the effects of entrepreneurship education, as it increases the legitimacy of the subject in academia and builds an understanding of what students gain from the learning activities included in courses and programs (Fayolle & Gailly, 2015; Pittaway & Edwards, 2012; Rauch & Hulsink, 2015). In this dissertation I have adopted the survey by Kember et al. (2000) to measure the level of reflective thinking. However, in order to capture the long-term effects of education and the current pedagogical approaches promoted in entrepreneurship education, further research is needed on alumni, both those who continue as entrepreneurs and those who become agents of change in society. In this lies the connection to educational science and the insights developed through research on measuring learning effects. This is still an underdeveloped area that requires further research to justify pedagogical practices and assess the value that entrepreneurship education brings to society.

Thirdly, an implication for future research is to increase the focus on multidisciplinary integration of educational science and pedagogical literature to strengthen the pedagogical and instructional depth of the field. Integrating educational literature enables us to question taken for granted assumptions that were implicitly developed over time in the research field of entrepreneurship education. In this dissertation I have raised a number of concerns regarding the implicit assumption of action orientation in entrepreneurship education, especially

evident in my systematic literature review and theory chapter. I did this by integrating previous research on learning through experience (Dewey, 1930) with contemporary research on instructional science from cognitive load theory (Kalyuga et al., 2003; Kirschner et al., 2006; Paas & Sweller, 2012), as well as literature discussing the importance of domain-specific knowledge (Alexander, 1992, 2003, 2004) when developing learning activities to promote knowledge development. Through this synthesis and based on my empirical findings I have argued for a balance between body and mind. Nevertheless, more research is needed to further our scholarly understanding of what is learnt, how different learning activities affect learners and their progress, and why we include or exclude recent advances made in related fields for understanding and developing entrepreneurship education.

Finally, the dissertation has also discussed the importance of methodological considerations regarding process data and triangulation of different data sources when researching how learning leads to knowledge. Throughout my empirical studies I have made use of methodological triangulation and empirical triangulation to trace how learning is developed into knowledge (Cohen & Manion, 1994). In addition, I have consistently employed process oriented empirical material collected over time to trace how the learning process evolved and finally resulted in knowledge. Hence, an implication for future research is the importance of triangulation and utilization of process data when claiming that learning has occurred. The studies conducted indicate that insights on the importance of process data and complimentary sources or methods are essential for developing both a subjective and an objective view on what has taken place in the learning situation. Although subjectivity is an important part of understanding student learning, it does not on its own provide support for how the pedagogical methods included in the learning process lead to knowledge. Providing support for how the pedagogical methods included in the learning process lead to knowledge is found in the intersection between an objective and a subjective view, where openness to both views is necessary when researching learning in an educational setting.

The main implications for future research are summarized in Table 4.2, but further implications can also be found in the discussion in paper one, where my co-author and I present three challenges facing the field of entrepreneurship education, (1) increasing legitimacy while maintaining relevance, (2) cross-fertilization between entrepreneurship research and entrepreneurship education research, and (3) recognizing the often implicit assumptions on learning embedded in dominant pedagogical approaches.

In the study we also address four areas for future research based on our analytical framework: (1) the role of the instructor (who) has been scarce, as the main discussions on pedagogy in entrepreneurship education have focused on curricula design, teaching content, students' learning process, and implementation

of teaching methods. Hence, there are few scholarly contributions about the instructor and those that exist are largely descriptive, resulting in a lack of theoretical insights about the role of instructors in the context of entrepreneurship education (Seikkula-Leino, Ruskovaara, Ikavalko, Mattila, & Rytkola, 2010). (2) Further research is also needed on program design and teaching content (what). Despite a large number of studies on these issues, most are conducted and discussed in isolated contexts, and there are few comparative studies of entrepreneurship education, which has led to contextual isolation that limits pedagogical debates. Knowledge about how program design and implementation vary across temporal and spatial contexts is greatly needed (Lyons, Lynn, & Mac an Bhaird, 2015; Walter & Block, 2015). (3) Future research should also explore the learning needs of entrepreneurship students (for whom) by acknowledging and integrating multiple learning theories from research on adult education and instructional science to develop a more holistic perspective on entrepreneurial learning processes (Macht & Ball, 2016). Finally (4), the review also suggests the need to address the 'how' of entrepreneurship education, specifically related to the development of appropriate assessment frameworks. Due to the high context dependency of entrepreneurship education research and the innovative and progressive implementation of teaching methods, there is a lack of theoretically grounded and methodologically sound evaluation and assessment frameworks that can substantiate the impact of entrepreneurship education, making this scholarly area important for future research (Liñán & Fayolle, 2015; Pittaway & Edwards, 2012; Pittaway, Hannon, Gibb, & Thompson, 2009).

Table 4.2: Summary of implications for future research

Area	Challenge
Intellectual and conceptual depth. This means building on the broad array of scholarly work that has been produced in the field of education and integrating this knowledge with current perspectives in the fields of entrepreneurship, entrepreneurial learning, and entrepreneurship education.	How has the learning theory that we use been developed and what are its basic assumptions for capturing learning and knowledge development?
Assessing and evaluating effects of entrepreneurship education to further position and legitimize the domain as a subject and research area in academia.	What should be measured and how can it be measured?
Pedagogical and instructional implications are to further develop our understanding about the triad of action, reflection, and theory when developing learning activities that seek to enhance entrepreneurial knowledge in students who wish to become entrepreneurial.	How can we structure learning activities based on the type of learner?
Methodological implications are to build stronger and more rigorous methods, where triangulation and a process perspective are essential to capture how learning is developed, but also for connecting the type of learning outcome sought with a particular method.	How can we capture the learning process and knowledge development within the educational setting?

4.7 Conclusion

This dissertation has sought to explain the importance of reflective thinking as a counterbalance to the basic assumption of action orientation when educating student entrepreneurs. To achieve this purpose a conceptual framework of the process of entrepreneurial inquiry was developed through the empirical insights gained in the course of the research process. The conceptual framework combines theory on how humans store and develop knowledge from a cognitive perspective with research on how to tailor education based on learning through experience. Together, these two theoretical streams provided a platform for the empirical studies conducted and the findings that emerged.

Based on the empirical findings, the development of entrepreneurial knowledge in an educational context is dependent on the stimulation of different types of knowledge including declarative, procedural, and conditional knowledge as well as contextual awareness. In addition, guidance related to the proficiency of the student, and the directional process of entrepreneurial inquiry are important elements for understanding the development of entrepreneurial knowledge in experiential entrepreneurship education. From the empirical studies it has been established that reflective thinking is the means of transforming experience into knowledge. However, the empirical studies also provided insights on how the three pedagogical methods play different roles when student entrepreneurs develop reflective thinking ability, described as a transactive educational process, termed the process of entrepreneurial inquiry.

To conclude this dissertation that has sought to develop, and to some extent challenge, an implicit assumption of action when teaching and learning entrepreneurship, I find it appropriate to relate back to an early dialectic suggested by Dewey, in which he argued, “learn to do by knowing and to know by doing” (McLellan & Dewey, 1889), which in many ways has guided the inquiry in this dissertation.

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