UNIVERSITY OF TURKU

That I need to be more active and focused in my studies

Everyone can be an entrepreneur – also I!

To be creative and step out of my comfort zone!

I learned how to bring entrepreneurial spirit into myself and to the organization

Opin yrittäjyydestä ja erityisesti sen moninaisuudesta

To think and ACT differently!

I learned that entrepreneurship is not about creating startups but a mindset and a culture

Nothing.

That I am an entrepreneurial person

To take bold actions in my current job

To be quite comfortable with the teaching methods used

Striving for happiness and success

Many things: especially that studying for an exam is not the best possible way to learn. If you actively process the information and try out things, you can learn more and it sticks better.

How theoretical knowledge can be used and practiced in reality

That entrepreneurship is about action!

I learned the key concepts

VIERAILIJAT!!! opin paljon heiltä!

What entrepreneurship means in action

To challenge myself

To believe in myself and my intuition

I learned many things about entrepreneurship and also something about myself

Opin paljon yrittäjyyden teoriaa ja käytäntöä yhdistettynä toisiinsa

I learned to reflect academic knowledge, to turn it to the actions of everyday life, and to expand my view on entrepreneurship.

Opin, mitä teoriassa tarvitsee yrittäjyyteen ja oman mahdollisuuden löytämiseen – ja sen, ettei tule antaa periksi omien unelmien edessä!

Achieving great things requires going out from the comfort zone

I learned that entrepreneurship is an over-typed cliché word

ENTREPRENEURIAL LEARNING IN ENTREPRENEURSHIP EDUCATION IN HIGHER EDUCATION

Sanna Ilonen

UNIVERSITY OF TURKU

ENTREPRENEURIAL LEARNING IN ENTREPRENEURSHIP EDUCATION IN HIGHER EDUCATION

Sanna Ilonen

University of Turku

Turku School of Economics
Department of Management and Entrepreneurship
Entrepreneurship
Doctoral Programme of Turku School of Economics

Supervised by

Professor Jarna Heinonen
Turku School of Economics
University of Turku

Dr Pekka Stenholm
Turku School of Economics
University of Turku

Reviewed by

Professor Heidi Neck
Arthur M. Blank Center for
Entrepreneurship, Babson College

Associate Professor
Karen Williams Middleton
Department of Technology Management
and Economics, Division of
Entrepreneurship & Strategy
Chalmers University of Technology

Opponent

Associate Professor
Karen Williams Middleton
Department of Technology Management
and Economics, Division of
Entrepreneurship & Strategy
Chalmers University of Technology

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Cover quotes: Handpicked student feedback the doctoral candidate has received from her entrepreneurship courses.

UNIVERSITY OF TURKU
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ABSTRACT

This dissertation investigates entrepreneurial learning in entrepreneurship education in higher education. In the field of entrepreneurship education, scholars believe that in order to learn entrepreneurship, one must do entrepreneurship. To develop and design entrepreneurship education, an understanding of entrepreneurial learning, which is a research field that explores entrepreneurs, has been pointed out as key. Despite the acknowledged importance of entrepreneurial learning, it has been under-addressed in the literature on entrepreneurship education. Higher education is an interesting context in which to investigate entrepreneurial learning because the practical nature of entrepreneurship has been presented as a value that does not necessarily suit the scientific aims of higher education. Using a mixed-methods approach, this dissertation investigates whether and if so how entrepreneurial learning takes place in entrepreneurship education in higher education. The aim of the dissertation is addressed through three research questions: 1) how are the entrepreneurial learning environments of entrepreneurs created in entrepreneurship education, 2) what is the entrepreneurial learning content in entrepreneurship education, and 3) what are entrepreneurial learning outcomes achieved in entrepreneurship education?

    The findings are derived from four independent articles, each approaching the topic area from a different perspective. The articles rely on interviews, documentary data (learning reflections and course materials), surveys and observation data. The first article increases the understanding of higher education as a complex and disparate context of entrepreneurship education. The second article utilises an educator's perspective of how learning environments are created in entrepreneurship education. The third article focuses on the entrepreneurial learning of students from the point of view of decision-making and how this evolves over time. It also provides insights into the problems and failures that students might encounter as part of their learning. The fourth article focuses on students' in-depth learning outcomes.

     This dissertation reveals that entrepreneurial learning can take place in higher education. The key finding is an educational model for entrepreneurial learning in entrepreneurship education. The elements of this educational model are context, content, the learning environment and learning outcomes, which are bundled. The findings show that entrepreneurial learning in entrepreneurship education in higher education is a process whereby theoretical knowledge of entrepreneurship is learned,

and entrepreneurial activities take place and are reflected in relation to each other to develop subjective stocks of knowledge, through which entrepreneurial devotion develops. The findings suggest variations in the roles of educators and learners. By setting learning objectives, the educator has a more prominent role in determining the context and deciding the content of education. The educator and learner both have important roles in the co-creation of entrepreneurial learning environments. The learner has a crucial role in determining whether the entrepreneurial learning outcome, entrepreneurial devotion, is developed. Moreover, if the educator maintains control without providing the learner with the possibility to take control of his/her learning, and if the learner is unwilling to participate in co-creation and take control of his/her learning, entrepreneurial learning in entrepreneurship education fails to materialise. The overall contribution of the dissertation is the binding of entrepreneurial learning and entrepreneurship education and describing what this merger means in higher education.

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Turun kauppakorkeakoulu
Johtamisen ja yrittäjyyden laitos
Yrittäjyys
SANNA ILONEN: Yrittäjämäinen oppiminen korkeakoulutuksen
                  yrittäjyyskasvatuksessa
Väitöskirja, 148 s.
Turun kauppakorkeakoulun tohtoriohjelma
huhtikuu 2020

TIIVISTELMÄ

Väitöskirjassa tutkitaan yrittäjyyskasvatuksessa tapahtuvaa yrittäjämäistä oppimista korkeakoulukontekstissa. Yrittäjyyskasvatuksen kentällä ajatellaan, että opiskelijan pitää omakohtaisesti kokeilla yrittäjyyttä sitä oppiakseen ja että yrittäjyyskasvatuksen kehittämisen ja suunnittelun kannalta on tärkeää tuntea yrittäjämäiseen oppimiseen liittyvän tutkimuskenttä, joka perinteisesti keskittyy yrittäjien oppimiseen. Yrittäjyyskasvatuksen tutkimuksissa ei kuitenkaan ole riittävästi tutkittu yrittäjyyskasvatuksessa tapahtuvaa yrittäjämäistä oppimista. Tämä monimenetelmällinen väitöskirja tarkastelee, voiko yrittäjämäistä oppimista tapahtua osana yrittäjyyskasvatusta korkeakoulukontekstissa, ja jos voi, niin miten. Tätä tarkastellaan analysoimalla, 1) mitä yrittäjämäinen oppimisympäristö tarkoittaa yrittäjyyskasvatuksessa, 2) mitä yrittäjämäinen oppimissisältö pitää sisällään yrittäjyyskasvatuksessa ja 3) millaisia oppimistuloksia yrittäjämäinen oppiminen yrittäjyyskasvatuksessa tuottaa?

Tutkimusaineisto koostuu haastattelu-, dokumentti- (oppimispäiväkirjat sekä opintojakson suunnittelumateriaalit), kysely- sekä havainnointiaineistoista. Väitöskirjan tutkimustulokset pohjautuvat neljään osatutkimukseen, jotka on raportoitu tieteellisinä artikkeleina. Ensimmäinen artikkeli tuottaa ymmärrystä korkeakoulutuksesta monitahoisena sekä epäyhtenäisenä yrittäjyyskasvatuksen toteuttamisalustana. Toinen artikkeli tarkastelee, kuinka opettajat suunnittelevat ja toteuttavat yrittäjämäisiä oppimisympäristöjä yrittäjyyskasvatuksessa. Kolmas artikkeli käsittelee opiskelijoiden oppimista päätöksenteon logiikoiden ja niissä tapahtuvien muutosten näkökulmasta yrittäjyysopetuksessa. Artikkeli tuottaa uutta tietoa yrittäjyyden alkuvaiheen ongelmista ja epäonnistumisista. Neljäs artikkeli keskittyy syvällisiin, affektiivisiin oppimistuloksiin yrittäjyyskasvatuksessa.

Tulokset osoittavat, että yrittäjämäistä oppimista voi tapahtua yrittäjyyskasvatuksessa. Väitöskirjan päätuloksena esitetään yrittäjämäistä oppimista yrittäjyyskasvatuksessa kuvaava teoreettinen malli. Mallin osa-alueet ovat konteksti, sisältö, oppimisympäristö ja oppimistulokset, jotka ovat vahvasti sidoksissa toisiinsa. Yrittäjämäisen oppimisen toteutuminen korkeakoulutuksessa riippuu siitä, miten mallin osa-alueita toteutetaan. Tulokset osoittavat, että yrittäjämäinen oppiminen yrittäjyyskasvatuksessa on prosessi, jossa oppija oppii teoreettista tietoa yrittäjyydestä, kokeilee yrittäjyyttä käytännössä sekä reflektoi opittua siten, että hänen subjektiivinen tietoisuutensa yrittäjyydestä kasvaa ja hän sitoutuu yrittäjämäiseen

toimintatapaan. Tulokset osoittavat, että opettajan ja oppijan roolit painottuvat eri tavoin yrittäjämäisen oppimisen eri osa-alueilla. Opettajan rooli painottuu oppimiskontekstin ja opetussisällön suunnittelussa. Opettaja ja oppija luovat yhdessä yrittäjämäisen oppimisympäristön. Yrittäjämäisessä oppimisessa keskeistä on, että opettaja antaa oppijalle mahdollisuuden ottaa vastuun omasta oppimisestaan. Vastavuoroisesti tärkeää on, että oppija sitoutuu tähän vastuuseen. Oppijan aktiivinen rooli on kriittinen yrittäjämäisessä oppimisessa. Väitöskirjan keskeinen kontribuutio on, että se yhdistää yrittäjämäisen oppimisen yrittäjyyskasvatukseen ja kuvaa, mitä se tarkoittaa ja miten se ilmenee korkeakoulutuksessa.

ASIASANAT: yrittäjyyskasvatus, yrittäjämäinen oppiminen, korkeakoulutus

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<div align="right">

March 2020
Sanna Ilonen

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Tables

Figures

List of Original Publications

The dissertation is based on the following original publications, which are referred to in the text by their Roman numerals:

I   Suomalainen, S., and H. Laalo (2015) The views of university staff on the preconditions for entrepreneurship education at the university [In Finnish: Henkilökunnan näkemyksiä yrittäjyyskasvatuksen edellytyksistä yliopistossa]. *Hallinnon Tutkimus* Vol. 34 (No. 4), 297–309.

       The lead author, Ilonen née Suomalainen, contributed to the conception and design of the study, the data collection, data analysis and interpretation and the writing up of the manuscript. She was also responsible for the submission and publication process. The second author, Laalo, contributed to the conception and design of the study and the writing up of the manuscript.

II   Ilonen, S. Active learning environment in entrepreneurship education in higher education: educators' perspective. Under review in *Entrepreneurship Education and Pedagogy*, earlier version published in *Proceedings of the RENT XXXIII Conference.*

III   Ilonen, S., J. Heinonen, and P. Stenholm (2018) Identifying and understanding entrepreneurial decision-making logics in entrepreneurship education. *International Journal of Entrepreneurial Behavior and Research* Vol. 24 (No. 1), 59–80.

       The lead author, Ilonen, contributed to the conception and design of the study, qualitative and quantitative data collection, data analysis and interpretation and was responsible for writing the manuscript. Later, she revised the manuscript based on the inputs of senior co-authors and was responsible for the submission and publishing processes. The second author, Heinonen, contributed to the conception and design of the study, qualitative data analysis and interpretation and was responsible for writing the manuscript. The third author, Stenholm, contributed to the conception and design of the study,

quantitative data collection, quantitative data analysis and interpretation and was responsible for writing the manuscript.

IV   Ilonen, S., and J. Heinonen (2018) Understanding affective learning outcomes in entrepreneurship education. *Industry and Higher Education* Vol. 32 (No. 6), 391–404.

The lead author, Ilonen, contributed to the conception and design of the study, qualitative data collection, data analysis and interpretation and was responsible for writing the manuscript. She revised the manuscript based on the input of a senior co-author and was responsible for the submission and publishing processes. The second author, Heinonen, contributed to the conception and design of the study, qualitative data analysis and interpretation and was responsible for writing the manuscript.

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1 Introduction

1.1 Rationale for the study

Entrepreneurial learning (EL) has been of focal interest among entrepreneurship scholars. It has traditionally described the learning of entrepreneurs when engaging in entrepreneurship (Wang & Chugh 2014; Holcomb et al. 2009; Politis 2005; Ravasi & Turati 2005). Scholars in this field share the common understanding that entrepreneurs are doers and that learning derives either from their actions or when they examine the actions of other entrepreneurs. Their experiences allow them to gain new knowledge, and through that, their existing knowledge structures are developed and updated (Minniti & Bygrave 2001). This can lead to incremental or radical change in their behaviour (Politis & Gabrielsson 2009; Cope 2005).

Further, in the field of entrepreneurship education (EE), many scholars have agreed that to learn entrepreneurship, one must do entrepreneurship (Neck & Corbett 2018; Neck et al. 2014). Consequently, EL has been hailed as a prerequisite for designing entrepreneurship-related education (Hahn et al. 2017; Lackéus 2013; Neck & Greene 2011; Man 2007). Understanding EL is important for designing education that resonates with the settings in which entrepreneurs learn. However, it must be acknowledged that some levels of education might be more welcoming of this type of practical approach than others. Some scholars have suggested that entrepreneurship does not fit the scientific aims of higher education, arguably because the practical orientation and professional aims of EE (see Refai & Klapper 2016; Chang 2014; Fayolle 2013) challenge the traditional scientific basis and aims of higher education (see Solomon 2007; Tirronen 2005, 82–85). Blenker et al. (2008) have also maintained that higher education is a complex and challenging context for entrepreneurship.

Scholars have pointed to a dearth of comprehensive knowledge of how EL occurs in different institutional settings, such as in higher education. Hahn et al. (2017) investigated the relationship between EE and EL outcomes by building on human capital theory. Empirically, they drew on cross-sectional quantitative survey data and alluded to the need for a more nuanced view of EL in EE. Scholars have also examined the theme from other important angles. For example, Secundo et al. (2017) explored collaborative EL processes between entrepreneurs and students, and

Pittaway and Cope (2007) carried out simulations of an EL context among students. Further, a study by Kurczewska et al. (2018) investigated personality and intelligence constructs and seemed to build on the assumption that EL occurs automatically in the context of education. However, even considering its acknowledged importance and a few initiatives to study EL in EE, the discussion of EL in EE has remained under-addressed by entrepreneurship scholars (Williams Middleton et al. 2019; Hahn et al. 2017; Neck & Greene 2011; Edelman et al. 2008). The current research in the field does not provide an explanation of what EL in the context of EE means, neither does it focus simultaneously on the various elements of education; thus, it neglects the complexity of education. A focus on multiple elements would produce a more holistic understanding of what EL in EE is. It is against this backdrop that the focus of this dissertation was formed. In this dissertation, I investigate EL in EE in higher education. More specifically, my aim is to study whether and if so how EL takes place in EE in higher education. Higher education has been selected as the context of this dissertation because although instituting EE in academia has recently been presented as an important part of higher education policy, the context presents challenges and complexities in relation to the adaptation of practical and professional aims.

1.2   The key concepts of the study

Entrepreneurship is a multifaceted and interdisciplinary phenomenon. The dissertation follows the classical definitions of entrepreneurship, viewing it as the emergence of something new, which creates value (see Bruyat & Julien 2001; Gartner 1988, 1990). Value creation does not only mean the creation of economic value, which occurs by delivering to others something that they want or need; it can also mean other types of value, such as the creation of enjoyment value in terms of joy, fun and self-fulfilment (see Lackéus 2018).

Entrepreneurship education is seen as a complex educational and scholarly field characterised by a wide array of definitions. There are two main approaches to EE: a narrow view, which focuses on the education of students to become and succeed as business owners, and a broader view, which is the view taken in this dissertation. According to this view, EE is education that aims to help students become entrepreneurial so as to utilise entrepreneurial competencies more generally to create value. This broader approach of EE is also often called enterprise education (see Liguori et al. 2019; Jones & English 2004; Gibb 2002). EE can have numerous aims: to foster learning to become an entrepreneurial individual (through entrepreneurship); learning to become an entrepreneur (for entrepreneurship) and learning to become an academic or teacher in the field of entrepreneurship (about entrepreneurship) (see Fayolle & Gailly 2008; Hytti & O'Gorman 2004). Typically,

the main focus of prior studies has been on 'for' entrepreneurship courses, but this dissertation acknowledges the importance of entrepreneurial individuals within different types of organisations, as stated by Kuratko and Morris (2018) and Kuratko et al. (2014). Neck et al. (2014) have argued that EE follows two types of pedagogical approaches. The first type is a theory-based pedagogical approach that fosters students' understanding of entrepreneurship. The second type is a practice-based approach that focuses on developing students' competencies in the field of entrepreneurship. Overall, EE is seen as an umbrella term containing different definitions, aims and approaches. EE is described in further detail in Chapter 2, where the theoretical grounding of this dissertation is presented.

The word *entrepreneurial* has hitherto lacked an exact definition. In this dissertation, it is regarded as being associated with several competencies required in employment and business life. These entrepreneurial competencies are knowledge, skills and attitudes, all necessary for the initiation of entrepreneurship (Bacigalupo et al. 2016). For example, these include opportunity skills, innovativeness, tolerance for uncertainty, creativity, perseverance and proactiveness (see Lackéus & Sävetun 2019; Bacigalupo et al. 2016; Lackéus 2015; Shane & Venkataraman 2000; Gartner 1990). *Being entrepreneurial*, therefore, can be considered to involve the ability to create value by utilizing the set of competencies mentioned above. This can occur in different contexts, such as in a business start-up or in an existing organisation, the latter of which refers to corporate entrepreneurship. *Becoming entrepreneurial* can be considered as being in a process towards being entrepreneurial.

The concept of *entrepreneurial learning* lies between entrepreneurship and organisational learning (Harrison & Leitch 2005). It has traditionally been used to describe the learning of entrepreneurs in their venturing (Wang & Chugh 2014; Holcomb et al. 2009; Politis 2005; Ravasi & Turati 2005). This dissertation follows Minniti and Bygrave's (2001) characterisation of EL as a process whereby an individual updates his/her stocks of knowledge on the basis of experience. Knowledge is classified into two types: market-specific knowledge and entrepreneurial knowledge. These updates can lead to incremental or radical changes in the behaviour of individuals (Politis & Gabrielsson 2009; Cope 2005). EL is described in greater detail in Chapter 2.

There is no universal definition of *learning*, but in this dissertation, it is seen as an active process whereby the learner constructs his/her own knowledge by adjusting new knowledge to meet prior understanding or by changing his/her prior understanding because of new knowledge (see Piaget 1971).

This dissertation examines EL in EE in *higher education*, which is the final stage of formal learning that grants higher education degrees or professional certifications. Higher education is provided by institutions such as universities, universities of applied sciences/polytechnics and institutes of technology. It is an optional level of

education. The present dissertation reports the findings from the context of degree-based education in higher education. This context is described in greater detail in Chapters 2 and 3.

The foundation of this dissertation lies in business studies and entrepreneurship research, though more specifically in EE research, but because the dissertation examines EL in EE, it encompasses the organisational literature. The theoretical grounding is complemented by discussions from the educational and pedagogical literature. As such, the dissertation lies at the intersection of these fields, making it interdisciplinary.

1.3   The aim of the study

In this dissertation, I investigate EL in EE in higher education. More specifically, my aim is to study whether and if so how EL takes place in EE in higher education. I approach the aim through an analysis of the three research questions below, which were formulated on the basis of the educational model for entrepreneurship adapted from Fayolle and Gailly (2008) and supplemented by discussions on context and the learning environment (see Chapter 2).

The dissertation answers the following:

1. How are EL environments of entrepreneurs created in EE? (Studies I, II, III and IV)

2. What is EL content in EE? (Studies II, III and IV)

3. What are EL outcomes achieved in EE? (Studies III and IV)

I approach these research questions through four original studies, which form the research material of the synthesis of this dissertation. The dissertation produces new knowledge of whether and if so how EL takes place in EE in higher education. Table 1 presents an overview of the original studies and how they relate to the research questions. Study I provides an overview of higher education as a platform for learning entrepreneurship from the point of view of academic staff. It presents important information on higher education as a context of both EE and in addressing the first research question. Study II produces an understanding of how learning environments are created from the educators' point of view and, thus, plays an important role in answering the first research question. Further, the use of secondary data was pivotal in providing information for the second research question. Study III focuses on the learning content of students, especially from the point of view of entrepreneurial decision-making and how this evolves over time. The study provides insights into the problems and failures that students may encounter as part of EE and addresses the first research question by giving an example of a learning environment

in the process of an EE intervention. Moreover, Study III provides information for the second research question, illustrating the students' learning over time. In addition, as the study examines the learning outcomes of students, it addresses the third research question. Study IV engages in an in-depth discussion of learning outcomes by focusing on affective student learning in EE. It can also be seen as an example of the learning environment and learning content in EE and, thus, provides information for the first and second research questions. As it focuses on learning outcomes, it provides information for the third research question.

1.4 The study outline

This dissertation comprises five chapters, with the remainder of this study proceeding as follows: Chapter 2 provides the theoretical grounding for the dissertation by building on an educational model for entrepreneurship and its elements. This model is elaborated by combining the entrepreneurship and educational literature, along with a discussion that introduces the model, and by showing how the elements of the model appear in EL and EE. At the end of Chapter 2, there is a synthesis of the discussions on EL and EE. Chapter 3 presents the methodology of the dissertation and starts by describing the two multidisciplinary universities under study – the University of Eastern Finland and the University of Turku – and the educational interventions under study – a venture creation course and a course on corporate entrepreneurship. After discussing these elements, the mixed-methods approach for the data collection and analysis and a reflection on the methodologies used are presented. Chapter 4 provides an overview of each of the four original studies (Studies I–IV). Chapter 5 brings together the main findings of this dissertation by answering the research questions and continuing the discussion by providing theoretical and practical implications. Afterwards, limitations and suggestions for future research are presented.

Table 1. The overview of the original studies and the relationship to the research questions

STUDY	AIM	THEORY/ LITERATURE	METHODOLOGIC AL APPROACH	MAIN FINDINGS	RQS
I Suomalainen, Sanna, and Hanna Laalo (2015) The views of university Staff on the preconditions for entrepreneurship education at the University. *Hallinnon Tutkimus* Vol. 34 (No. 4), 297–309.	This study examines the subjective perceptions of university faculty members concerning the preconditions for EE in a multidisciplinary university.	Entrepreneurial university; EE in higher education.	Quantitative	The study reveals an absence of a unified entrepreneurial culture. Faculty members do not mind entrepreneurship as a natural part of their teaching, but they do not have enough information on entrepreneurship. There are cross-faculty variations in the findings.	RQ1
II Ilonen, Sanna Active learning environment in entrepreneurship education in higher education: educators' perspective. Under review in *Entrepreneurship Education and Pedagogy*.	This study investigates how entrepreneurship educators create active LEs in EE in higher education.	LEs in EE in higher education; principles for de-signing LEs that facilitate learning.	Qualitative	The study suggests that an active LE is characterised by adjustable co-creation within a ' given' format, alongside individuals with complementary skills working in teams.	RQ1, RQ2
III Ilonen, Sanna, Jarna Heinonen, and Pekka Stenholm (2018) Identifying and understanding entrepreneurial decision-making logics in entrepreneurship education. *International Journal of Entrepreneurial Behavior and Research* Vol. 24 (No. 1), 59–80.	This study investigates students' decision-making logics during a new venture-creation process in EE and seeks to understand how decision-making logics are transformed during the new venture-creation process.	Decision-making logics with a focus on effectuation/ causation.	Mixed methods: qualitative + quantitative approach	The study reveals four different decision-making logics – effectuation, causation, hybrid and coping – at the beginning of the course. The 'pure' causal and effectual approaches vanish over time, and three transformation patterns lead individuals towards a coping decision-making logic.	RQ1, RQ2, RQ3
IV Ilonen, Sanna, and Jarna Heinonen (2018) Understanding affective learning outcomes in entrepreneurship education. *Industry and Higher Education* Vol. 32 (No. 6), 391–404.	This study examines students' affective learning outcomes in EE based on a taxonomy of such outcomes (Krathwohl et al. 1964) and an in-depth understanding of their nature.	A taxonomy of affective learning outcomes; learning outcomes.	Qualitative	The study suggests that EE can stimulate various external and internal affective learning outcomes based on the levels of expertise of the students; only internal affective outcomes are truly meaningful in EE.	RQ1, RQ2, RQ3

2 Theoretical Grounding

In this chapter, I introduce the theoretical grounding of this dissertation in the form of an educational model for entrepreneurship. This model allows for an investigation of EL and EE in a structured manner. The model is adapted from Fayolle and Gailly (2008), supplemented by the context and learning environment (Figure 1). The context and learning environment are inspired by discussions of educational and entrepreneurship scholars.

Fayolle and Gailly's teaching model for EE has been highly influential in the field of EE, and thus, it has been used as a premise for the theoretical grounding of this dissertation. It consists of two levels: ontological and educational. The ontological level focuses on the broader conceptual issues of EE, while the educational level encompasses the design and architectural issues of EE. The dissertation investigates EL in EE in higher education, and thus, the examination focuses on the educational level, allowing for the investigation of educational design. However, some modifications to the teaching model of Fayolle and Gailly are made. The original teaching model has five dimensions in the educational level: 1) why, which focuses on the objectives and goals of education; 2) for whom, which focuses on audiences and target groups; 3) for which results, which encompasses evaluation and assessment; 4) what, which focuses on content and theories and 5) how, which focuses on methods and pedagogies.

In order to address the aim of this dissertation, to investigate whether and if so how EL takes place in EE in higher education, these dimensions of the model have different roles. The research aim defines two initial dimensions – 'why' and 'for whom' – as this dissertation focuses on EL in EE in higher education. The third dimension in the original model is 'for which results', regarding which Fayolle and Gailly (2008) highlight assessment and measurement issues. Since EL has not been investigated in an in-depth manner in EE, I decided to focus on achievable learning outcomes rather than how to measure them. This is a narrower approach than that in Fayolle and Gailly's (2008) model, but I consider it to be justified: if learning outcomes are not yet known, it is difficult to consider measurement issues. The fourth dimension is 'what', which focuses on the content of education. It is of great relevance to this dissertation and, thus, has been adopted in the theoretical grounding.

The fifth dimension of Fayolle and Gailly's original model is 'how', which focuses on pedagogical aspects/methods. However, there has been an increased focus on advancing a broader discussion on learning environments, i.e. learning settings in which students learn. This means that focus should not only be placed on pedagogical methods/aspects, as they represent only one aspect of the learning environment. A learning environment generally influences student learning (Veermans & Murtonen 2017). Thus, the model is supplemented by a learning environment that incorporates the pedagogical aspects/methods discussed in Fayolle and Gailly's (2008) original model, though it goes beyond these aspects/methods. The educational context has been discussed as an important element of education, with scholars arguing that attention should be placed on the context in EE (Thomasson et al. 2019). It is especially important in EE in higher education because higher education is a rather complex context for entrepreneurship (see Blenker et al. 2008). However, context is not highlighted in Fayolle and Gailly's (2008) model. Due to its acknowledged importance, it is taken into consideration in the theoretical grounding of this dissertation as a way to understand EL in EE more holistically, as this dissertation investigates higher education.

The elements of the proposed model are the context of learning, the content of learning, the learning environment and learning outcomes. The *context of learning* refers to the institutional, university-specific context that must be taken into consideration when examining learning (see Thomassen et al. 2019; Entwistle & Robinson 2004). Different cultural forces, guiding beliefs, ideals and existing perceptions of faculty members form this institutional context. Moreover, education is highly influenced by pedagogical traditions, past practices and available resources (Entwistle & Robinson 2004). The *content of learning* refers to different contents and forms of knowledge, such as topics, themes and concepts, that learning aims to produce. The content can be seen as theoretical or practical in nature (Fayolle & Gailly 2008). The *learning environment* refers to the learning settings in which learning occurs. In education, the learning environment comprises physical spaces, virtual and digital elements and the social, cultural and pedagogical aspects of learning (see Veermans & Murtonen 2017; Frenzel, Pekrun & Goetz 2007). Fayolle and Gailly's (2008) teaching model framework for EE focuses solely on the pedagogical aspects/methods of learning and does not acknowledge other aspects of the learning environment more broadly. These aspects, however, play a significant role in learning (Veermans & Murtonen 2017). *Learning outcomes* demonstrate the different types of outcomes that develop through learning in the course of an intervention (see Nabi et al., 2017).

The above-described elements of the educational model for entrepreneurship are discussed from the point of view of EL and EE. These discussions are synthesised at the end of this chapter by pointing to the similarities and differences of the elements

of the educational model in terms of EL and EE and by discussing what has been neglected in the existing research.
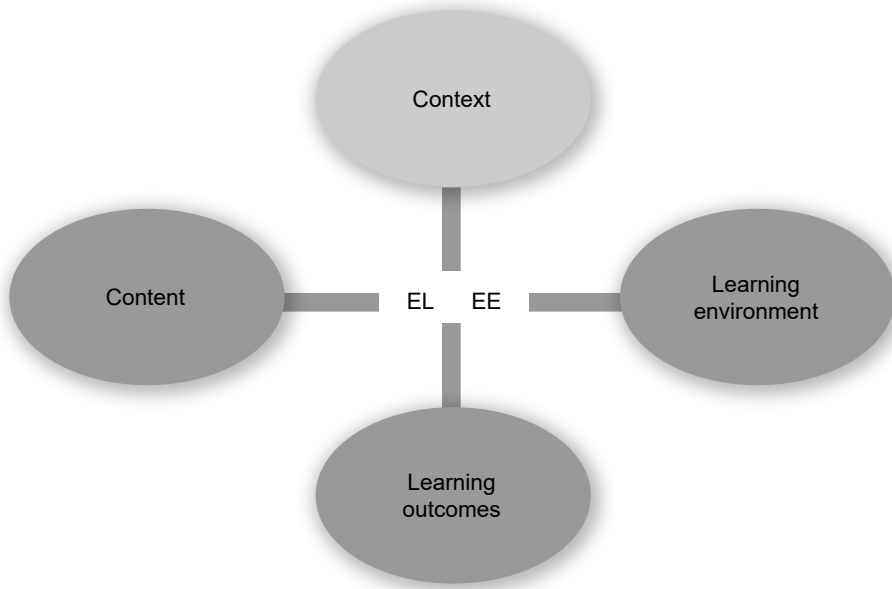
Figure 1. Educational model for entrepreneurship (adapted from Fayolle & Gailly 2008 and supplemented with discussions of the context and learning environment)

2.1 Context of learning

2.1.1 Entrepreneurs learn in a business context

In its traditional form, the EL literature investigates the learning process of entrepreneurs. Minniti and Bygrave (2001) see EL as a process whereby an individual updates his/her stocks of knowledge on the basis of experience. Lans et al. (2008) defined EL as learning by venturing, meaning that learning originates from the actions conducted as part of business activities. Thus, traditionally, the context of learning has been a business and the business environment in which the entrepreneur is involved (Rae & Wang 2015). There is a common understanding that the activities conducted in the entrepreneurial context can help entrepreneurs learn. For instance, habitual entrepreneurs have the advantage of utilising what they have learnt in their previous venturing activities as part of their current ventures (Politis 2005). Moreover, experienced entrepreneurs are better at connecting the dots between flagrantly unrelated changes or events because they have learnt and trained in this skill as part of their business activities (Baron & Ensley 2006).

More specifically, in their systematic analysis, Wang and Chugh (2014) pointed out that the entrepreneurial context can be diversified into three categories – *a start-up entrepreneurship context*, *an entrepreneurship in established businesses context* and *a general entrepreneurship context* – without a specific reference to businesses. In the start-up entrepreneurship context, the focus is on new businesses: new start-ups, university and academic spin-offs and start-up firms inside incubators. In the context of established businesses, there seems to be a proportionately balanced focus on small, medium- or large-sized businesses. The general entrepreneurship context has focused on enhancing the understanding of EL in the area of opportunity exploration and exploitation, and thus, it has contributed to discussions about opportunity in the field of entrepreneurship and EL (Wang & Chugh 2014).

Scholars have been especially interested in examining EL by looking at the evolving phases of businesses, for example, the early phase of a venture's life cycle. However, it must be noted that EL is important throughout a venture's life cycle; it is also important in different types of business environments and situations, both in turbulent and less turbulent environments (Rae & Wang 2015). Nevertheless, especially when operating in uncertain and dynamic environments, learning is seen as a prerequisite for helping a business survive because entrepreneurs are expected to make decisions and react quickly (Rae & Wang 2015).

2.1.2   Students learn in a higher education context

EE focuses on the learning students partake in as part of their education. Higher education institutes have emphasised the role of entrepreneurship in their curricula to equip students with the skills and abilities required to adapt to constant labour market change and be creators of economies. The emphasis is not only on the creation of new start-ups but also on the creation of more entrepreneurial individuals and organisations in general. Rather than being taught as an isolated subject in business schools, EE is encouraged as something that should be integrated horizontally into the curriculum in higher education settings (see Katz 2003). In addition to educating entrepreneurship for business students, students from non-business faculties have become increasingly important audiences of EE. Heterogeneous student populations have played a major role in the tremendous growth of EE, but they have also set requirements for designing the content and delivery of EE (Kassean et al. 2015; Lourenço et al. 2013).

Encouragement regarding the integration of entrepreneurship into different fields of science has not always existed; indeed, in most parts of the Western world, the field of higher education has undergone dramatic change in recent years (Ylijoki 2008). This change has been guided by higher education and science policies that increasingly highlight the role of higher education as a crucial economic player and

creator of innovations. This role has propelled the monitoring of both education and research from an economic perspective.

Practical orientation and an emphasis on professional aims are the cornerstones of EE (see Refai & Klapper 2016; Chang 2014; Fayolle 2013). However, this has resulted in the concern that universities are becoming overly practice-oriented, unscientific and too similar to vocational education (see Solomon 2007; Tirronen 2005). Moreover, the prevailing methods in EE often contradict the traditional educational practice of higher education (Pittaway & Thorpe 2012). Entwistle and Robinson (2004) have noted that education is often highly influenced by the pedagogical traditions of each subject area, past departmental practices and available resources. In addition, it has been contended that, at least in some cases, institutional aspects, such as culture and values, can be a greater obstruction to EE than the attitudes and competences of individual educators (Hytti & O'Gorman 2004). Because of this clash in academic and practical orientations, there is a need for more understanding of the special characteristics of EE in the higher education setting, especially considering that the higher education setting seems to be a rather complex context for entrepreneurship (see Blenker et al. 2008).

The above-described changes have generated uncertainty in the field of higher education (Ylijoki & Ursin 2015; Duberley et al. 2007). The contradictions and tensions between academic traditions and these recent shifts, including the different values and ideologies, are visible (Delanty 2003). Different disciplines have their own traditions, ways of thinking and social ways of living (Clark 1998; Becher 1989). They also emphasise research and scientific competence and teaching and professional aims to different extents (Rinne et al. 2012).

2.2 Learning content

2.2.1 Learning content of entrepreneurs

The EL literature highlights the importance of the knowledge of individuals. Scholars have described the various sets of structured knowledge as stocks of knowledge (Minniti & Bygrave 2001) or stocks of experience (Cope 2005; Reuber & Fischer 1999). These stocks of knowledge manifest the subjective knowledge of individuals. When an individual internalises knowledge, stocks of knowledge are developed and updated, and learning occurs. These stocks of knowledge can seal in information acquired prior to and during the entrepreneurial experience (Cope 2005). The stocks of knowledge that accumulate over time can contain different types of knowledge based on what is being learned, e.g. about oneself, the actual business, the business environment and important networks, managing the business and/or internal and external relationships (Cope 2005).

As Minniti and Bygrave (2001) stated, content has to do with two types of knowledge stocks: market-related knowledge and entrepreneurial knowledge. Market-related knowledge encompasses an understanding of a chosen market and concerns technical knowledge and knowledge of a product and the specific industry where the entrepreneur operates. This type of knowledge can be acquired directly through one's own experiences or indirectly, such as by hiring individuals with the sought-after knowledge. Keeping up with the development of this knowledge type requires individual alertness (Minniti & Bygrave 2001).

Entrepreneurial knowledge concerns how to be entrepreneurial by helping an individual make and act on suitable decisions under different circumstances. Minniti and Bygrave (2001) suggested that the learning process involves repetition and experimentation, both of which increase entrepreneurs' confidence in making decisions and increasing knowledge. Minniti and Bygrave (2001) also argued that through decision-making, individuals experiment with competing hypotheses on how to approach the issue they are facing. When new evidence emerges, some alternative ways of acting are reinforced, while some are weakened. Individuals learn to repeat only those actions that have brought desirable or better outcomes and disregard actions that have produced worse or negative outcomes. This is how positive actions become part of the knowledge stock upon which individuals form their decisions. However, individuals do make mistakes; they might not possess the complete information required for optimal decision-making, or they may be misled or reinforced by their previous actions. Minniti and Bygrave (2001) pointed out that individuals make actions based on a combination of their knowledge and random impulses (i.e. instinct or luck). When they approach a problem, they can have two types of strategies in their decision-making. By exploiting their pre-existing knowledge, an individual can take an action that is similar or very similar to one taken before or can choose to approach the problem by performing a new type of action, distinct from those taken previously.

Cope (2005) stated that entrepreneurs are not mavericks in terms of their EL, even though EL is often characterised as highly individualistic. Consequently, recent research has highlighted the importance of networks in terms of learning in difficult situations. Soetanto (2017) contended that individuals respond to difficulties by strengthening and expanding their current networks and by creating new networks for learning. Scholars have also alluded to the complexity of decision-making in entrepreneurship, acknowledging the benefit of creating competing hypotheses and forming a decision of action by evaluating these hypotheses. Entrepreneurs must make decisions in highly uncertain environments and under time constraints and high levels of stress; sometimes, the problems they encounter are simply novel (Baron 1998). These situations can result in the inability to make reliable calculations. Sarasvathy (2001) introduced effectuation as an entrepreneurial logic in response to

making decisions in highly uncertain and dynamic markets, where planning cannot successfully be applied due to missing and/or incomplete information. Scholars have thus suggested that studying the role of alternative decision-making logics in EL is crucial (Wang & Chugh 2014; Politis 2005).

2.2.2 Learning content of entrepreneurship students

There is no consensus regarding the content of EE (Solomon 2007). Scholars, however, have maintained that the main aim of EE is to facilitate students' personal growth and transformation by providing them with entrepreneurial knowledge, skills and attitudes (Gedeon 2014). More specifically, EE aims to teach students to become enterprising individuals (through entrepreneurship), to become entrepreneurs (for entrepreneurship) and to become academics or teachers in the field of entrepreneurship (about entrepreneurship) (see Fayolle & Gailly 2008; Hytti & O'Gorman 2004).

'About' entrepreneurship courses aim to raise awareness and are often operationalised by providing students with information about entrepreneurship as a phenomenon by utilising 'traditional' pedagogies, such as lectures and seminars (Hytti & O'Gorman 2004). Thus, in higher education, these 'about' courses often do not pedagogically stand out drastically from other types of education because these courses may not include experiential elements. In EE, however, most of the focus has traditionally been on courses aimed at the creation of new ventures and becoming an entrepreneur ('for' entrepreneurship). These courses are intended for students who are seeking support and training for their entrepreneurial project or wish to learn more about the context of real-life entrepreneurship in order to obtain practical knowledge and different techniques to act as entrepreneurs and start a venture (Fayolle & Gailly 2008). These types of courses are typically interventions that facilitate experimenting with a business idea and that try out entrepreneurship in a controlled educational environment. This can happen, for example, by setting up mini-businesses in a classroom or by providing basic knowledge and skills on 'how to' start and run a small firm and 'how to' act as an entrepreneur (Hytti & O'Gorman 2004). In these entrepreneurship courses, students are often exposed to some level of uncertainty because they are expected to ideate, test and exploit a business idea by starting a new business and taking into consideration the surrounding circumstances. These types of courses require self-regulation, taking control and assessing one's own learning and behaviour (see Neck & Corbett 2018). Because these venture creation processes train students' skills as entrepreneurs, Fayolle (2013) has suggested that it would be beneficial to incorporate other planning-related aspects, such as effectuation, to be part of the education, and to examine the students' behaviour in this regard.

Despite the importance of 'for' entrepreneurship courses, there is an increasing interest in the development of entrepreneurial individuals in a more general sense ('through' entrepreneurship). This type of approach has also been regarded by scholars as 'a broad approach to EE' and enterprise education (see Liguori et al. 2019; Jones & English 2004; Gibb 2002). Acting on opportunities and ideas by transforming them into different types of value (Lackéus 2015; Neck & Greene 2011) can occur in contexts other than that of a start-up, and thus, it can have relevance for the future careers of students, regardless of their interest in starting their own businesses (Bell & Liu 2019; Obschonka et al. 2017; Bell 2016). In line with this, there is an increasing need to understand how, when and why students learn in diverse educational settings (Lackéus & Sävetun 2019).

2.3   Learning environment

2.3.1   Learning environment of entrepreneurs

Scholars have been widely interested in how and when entrepreneurs' learning takes place. Individuals learn by experimenting in their daily actions – their learning environment is the business environment, which is unique for every individual. In terms of how this learning occurs, there is a common understanding that entrepreneurs are doers and that learning derives from their actions. In their systematic literature review, Wang and Chugh (2014) emphasised that experiential learning is mostly applied as a theoretical lens and learning mechanism of EL. According to Wang and Chugh (2014), many studies have built on Kolb (1984), but research has also referred to other forms of experiential learning, such as learning by doing (see Cope 2003) and learning from experience (see Minniti & Bygrave 2001).

According to Kolb (1984), experiential learning can be seen as a process whereby knowledge creation occurs when individuals learn through experience, reflection, thought and experimentation. Experiential learning theory entails four different learning modes: concrete experience, in which an individual has an experience; reflective observation, in which an individual reflects on that experience; abstract conceptualisation, in which one makes conclusions the experience; and active experimentation, in which one tries out what has been learnt. Like many seminal works, Kolb's experiential learning theory has been widely challenged. It has been criticised as mechanical, excessively simplified, deemphasising the role of individuals' ability to reflect, neglecting context and an overreliance on cognitive processes (see Kayes 2002; Reynolds 1999; Vince 1998).

Despite the important role of experiential learning, scholars have acknowledged that the exclusive reliance on experiential forms of learning is problematic. Holcomb et al. (2009) investigated the role of vicarious learning, that is, how individuals

supplement experiential learning by observing the behaviour and actions of others (see Bandura 1977). They contended that entrepreneurs can learn effectively through vicarious means by observing the successes and failures of others and forming general rules and strategies of how to approach new situations.

2.3.2 Learning environment of students

There is no universal recipe for learning settings in EE, as these settings depend on the objectives, contents and constraints of the institutional context. In terms of the physical learning environment of EE in higher HE, some studies have discussed the importance of the possibility of using free space for learning and carrying out entrepreneurial processes when needed (Vincent & Farlow 2008; Edwards & Muir 2005) as well as how certain elements in classrooms may hinder learning (Fayolle & Gailly 2008). The growing importance of virtual elements in learning has also been noted. In EE, specific virtual methods can provide learning experiences that develop an individual's complex decision-making skills. They can also offer instant feedback. However, it has been acknowledged that HE faculty members may not be sufficiently skilled in utilising these virtual and digital elements as part of their education (Rae 2012; Matlay & Carey 2008; Solomon 2007; Kuratko 2005). The psychical learning environment discussion encompasses the 'cultification' of EE or the hidden curriculum, the importance of contextual factors, heterogenic student groups and the role of different types of mentors and stakeholder groups in education (Farny et al. 2016; Chen et al. 2015; Walter et al. 2011).

Pedagogical methods and learning approaches are widely discussed in the literature on EE learning environments. There are concerns that some entrepreneurship educators may overemphasise methods over objectives and content-related aspects (Fayolle & Gailly 2008). In terms of pedagogical methods and learning approaches, many EE studies have embraced active, experiential learning, as expressed by the terms 'creative', 'novel' and 'new' (see Chang et al. 2014; Rae 2012; Gibb 2011; Kuratko 2005). In concrete terms, experiential learning means that students engage in different activities, such as roleplay, pitching, competitions and management simulations (Higgins et al. 2013; Walter & Dohse 2012; Kirby & Ibrahim 2011; Honig & Karlsson 2004). Comparatively, 'traditional' methods have comprised more passive elements of learning, such as listening to lectures, watching videos, reading and engaging in dialogue with others (Walter & Dohse 2012). The roles of students and teachers differ in experiential and traditional methods. When traditional methods are utilised, students remain passive, while the teacher dictates the learning process. The use of active methods requires students to participate more actively in the learning activities as well as to initiate the learning

process themselves. Indeed, experiential learning shifts the control from educators to students (Walter & Dohse 2012; Jones & English 2004).

The EE literature is replete with descriptions of ideal and utilised learning philosophies, pedagogical choices and methods and curricula. While there are many case descriptions (see Nyadu-Addo & Mensah forthcoming; Gibb 2011; Laukkanen 2000), the discussion seems to lack the reflexivity and structure necessary to further develop educational understandings and practices in EE. Moreover, there seems to be a dearth of knowledge on how these learning environments are created and their effect on students (Neck & Corbett 2018).

2.4 Learning outcomes

2.4.1 Learning outcomes of entrepreneurs

The EL literature discusses two types of learning outcomes for entrepreneurs: higher-level and lower-level learning outcomes (Politis & Gabrielsson 2009; Cope 2005). Higher-level learning outcomes make individuals act radically differently as opposed to just slightly refining their actions. Lower-level learning outcomes characterise the more incremental learning of individuals (Cope 2005). Through these outcomes, individuals can modestly refine their actions. Higher-level learning outcomes are often associated with unusual events, while lower-level learning outcomes can be developed through routines.

Cope (2005) contended that significant and discontinuous events, such as the opportunities and problems that entrepreneurs confront during the entrepreneurial process, are influential in creating higher-level learning outcomes. Politis and Gabrielsson (2009) rationalised this by explaining that if individuals face the consequences of their decisions and actions soon enough, they can reflect on the experience and learn from it. Thus, the most powerful learning outcomes come from situations where entrepreneurs can face and 'feel' the consequences of their decisions (Politis & Gabrielsson 2009; Cope 2005). Drawing on the work of Burgoyne and Hodgson (1983), Cope (2005) described that the learning outcomes of both levels are connected and that lower-level learning outcomes can become higher-level learning outcomes if incremental learning accumulates over time. Lower-level learning outcomes can thus reinforce radical change.

Entrepreneurship includes a strong emotional dimension – higher-level learning outcomes come into existence because they are embedded with strong emotions (Cope 2005). Thus, scholars have discussed that emotions and affection play a key role in the entrepreneurial process as well as in learning (Fang He et al. 2018; Cope 2011, 2005). Indeed, Rae (2013) stated that emotional aspects are undervalued in EL and concludes that scholars should further investigate these aspects.

2.4.2   Learning outcomes of students

Educational learning outcomes have been of primary interest among entrepreneurship scholars (Blenker et al. 2014; Vesper & Gartner 1997), and many interest groups have been eager to seek out the relevant metrics for assessing these outcomes (Kozlinska 2016). Entrepreneurship researchers and practitioners have long examined whether EE affects students and, if so, how. Many studies have provided anecdotal evidence of the outcomes of EE endeavours. The most widely studied outcomes are the self-efficacy of students, their entrepreneurial intentions and the number of start-up firms generated by EE (Nabi et al. 2017; Pittaway & Cope 2007).

Nabi et al. (2017) identified and then categorised several types of learning outcomes and impact indicators in the EE literature: changes in students' attitudes, skills and knowledge, their entrepreneurial intentions, the feasibility of students, business start-up–related outcomes, performance outcomes, socioeconomic outcomes and other possible outcomes. Studies focusing on attitudes have captured change in entrepreneurial awareness and perceptions towards entrepreneurship and certain attributes, such as self-esteem and achievement (see Fretschner & Weber 2013; Bakotic & Kruzic 2010; Friedrich & Visser 2006). Studies on skills and knowledge have analysed different types of skills and knowledge development, such as the opportunity-identification capabilities of students (Gielnik et al. 2014; Munoz et al. 2011), action-regulatory factors and the capability of taking entrepreneurial action (Gielnik et al. 2014). Feasibility studies have addressed, for instance, improving the entrepreneurial self-efficacy beliefs of students (see Piperopoulos & Dimov 2015). Intention studies have focused on how EE affects students' intent to start a business in the future; the results seem to be contradictory as to whether EE influences students' entrepreneurial intentions and, if so, how. Business start-up– related studies have focused on entry into self-employment after taking part in an entrepreneurship programme or course (Henry et al. 2004). Studies on performance and socioeconomic outcomes have addressed, for instance, the long-lasting value of EE in terms of business start-up after graduation (Lange et al. 2011) and how EE can facilitate business performance, a company's operations and regional development (Gordon et al. 2012). Studies falling in the 'other' category measured, for instance, students' satisfaction regarding EE and cognitive constructs, such as dispositional optimism (see Crane 2014; Rae & Woodier-Harris 2012).

Despite the various outcomes and impacts of EE, entrepreneurship scholars acknowledge a lack of rigorous research on the topic (see Nabi et al. 2017; Galloway et al. 2015; Fayolle & Gailly 2008; Honig & Karlsson 2004). This lack of research is prevalent particularly in relation to outcomes, which can affect students in the long term and depth in terms of understanding the indicators related to the development of an entrepreneurial mindset (Nabi et al. 2017).

2.5 Bridging the elements of entrepreneurial learning and entrepreneurship education literature

In this section, I summarise and synthesise the discussions on the educational elements of EL and EE. I also discuss the current state of knowledge in the literature as well as the knowledge needs (Table 2).

Table 2. Summarising the elements of EL and EE

ELEMENT	ENTREPRENEURIAL LEARNING		ENTREPRENEURSHIP EDUCATION	
	Traditionally considers the learning of entrepreneurs		*Traditionally considers the learning of students*	
	State of knowledge	*Knowledge needs*	*State of knowledge*	*Knowledge needs*
Context	Business as the traditional context: the different stages and sizes of businesses are explored	How does learning take place in different types of business environments?	Higher education institutions as the context: universities as creators of innovation	What are the special characteristics of EE in higher education settings?
Content	The development of knowledge stocks in market-related and entrepreneurial knowledge	What does entrepreneurial knowledge entail?	Different aims: becoming an enterprising individual, an entrepreneur and/or an academic or teacher in the field	How can achievement of these different aims be supported?
Learning environment	LE enabling experiential learning (i.e. how entrepreneurs learn when they operate)	What is the role of vicarious learning?	Encouragement of experiential learning, which depends on the objectives, contents and institutional constraints	How are learning environments created?
Learning outcomes	Two levels of learning outcomes: higher-level learning outcomes have dramatic effects, while lower-level learning outcomes do so incrementally	What is the role of different emotional aspects in EL?	Various outcomes: change in attitudes, skills and knowledge, feasibility, entrepreneurial intentions, start-ups, use of performance indicators and socioeconomic impact and other EE impacts	What are the long-term and in-depth learning outcomes of EE?

Traditionally, EL has focused on the learning of individuals who engage in entrepreneurship, while the aim of EE has been to facilitate student learning. In

literature-based comparisons of EL and EE, a starting point is the key difference in *context*. The learning context in EL has traditionally been the business in which individuals operate, while in EE, this has been the institution in which individuals study. Various higher education institutional actors, such as faculty leaders, members and students, create the learning context where EE occurs. These actors may have differing views on entrepreneurship, entrepreneurship in higher education and what entrepreneurship generally means. The role of EE in higher education has been the subject of debate (see Chapter 2.1.2), and a major concern is the balance between its practicality (compared with scientific pursuits) and how it is encouraged to be taught (practice-based learning) in higher education. The specific characteristics of higher education institutions can influence the extent to which students encounter learning situations that reflect the learning of entrepreneurs.

Regarding the *content*, learning content of an entrepreneur depends on what an individual confronts and decides to confront in the business. Knowledge stocks evolve from these experiences. In EE, the content depends on the objectives set. Noteworthy, in EL, the content of learning is mainly but not exclusively in the hands of the individual entrepreneur; it also depends on business activities. In EE, educators have traditionally determined the content. Accordingly, the content of EE varies from learning specific content knowledge on entrepreneurship as a phenomenon to learning to become an entrepreneurial individual or an entrepreneur. All these forms of learning can also take place in EL. Because the educator sets the objectives in EE, his/her own knowledge, skills and competences are of tremendous importance in terms of determining the content. However, the role of the self-regulated learning of students – a process where students take control and assess their own learning and behaviour – has also recently been discussed, essentially shifting the focus from educators to students. EL scholars have noted that entrepreneurs face different types of environments; they must operate by making decisions under uncertain situations, where the logic of prediction does not provide sufficient outcomes (Packard et al. 2017; Sarasvathy 2001). The same discussion concerns EE, as students should be exposed to uncertainty in order to learn and gain the ability to better operate in real markets. In EL, there is an increasing interest in understanding how entrepreneurial knowledge evolves, while in EE, the focus is on how to support student learning in terms of achieving aims in different settings.

The learning environment of EL has been discussed mainly from the point of view of ways of learning. Entrepreneurs' learning occurs mainly through experiential means, and many studies have relied on Kolb's (1984) experiential learning theory. In EE, the learning environment is crafted through the objectives, contents and constraints of the institutional context. The discussion has mainly revolved around the pedagogical aspects of learning environments, which, according to some researchers, are overemphasised (see Fayolle & Gailly 2008). Learning

environments that lean on experiential learning are also preferred in the area of EE, as these environments are believed to enable students to become entrepreneurial. EE environments often follow constructivism, which differs from the behaviourist school of thought commonly utilised in higher education; this might hinder the use of experiential forms of learning in higher education settings. If the behaviourist school of thought is followed, the learning environment design will be quite clear-cut – the key complexity is in providing and presenting the material to students in a way that allows for the acquisition of the intended material. In experiential learning, this is not the case. The design of the learning environment is encouraged to support active learning and guides students towards self-regulation, with educational tasks being designed accordingly, and encourages the acquisition of self-regulated processes. Also, the learning environment considers social aspects as well as the individual differences of students. The design of the learning environment, therefore, is not an easy task, and EE attempts to replicate the learning environments of EL.

The *learning outcomes* of EL and EE have some commonalities and differences. In EL, learning outcomes are related to knowledge accumulation and how entrepreneurs change their decision-making and related actions when knowledge accumulates in relation to coping in the business environment. In EE, some of the investigated learning outcomes are related to personal change and perceptions of entrepreneurship, while some are related to business start-ups and performance. In EE, these business-outcome-related studies seem to be closer to the EL literature than outcome studies focusing on personal change (such as the development of entrepreneurial intentions). Despite these differences, both streams of literature acknowledge the importance of studying meaningful learning that truly engages the individual. In EL, emotional events are important in the creation of significant higher-level outcomes, and in EE, there is still a need to study the different types of long-term and in-depth learning outcomes that can be achieved through educational interventions.

In all, in order to examine EL in EE, there is a need for a greater understanding of the specific characteristics of EE in higher education. This is important because learning is contextual. Different values and ideals affect students' learning mainly because educators are affected by the context in which they operate, and through them, the context affects students. Context plays an important role in how EE is practised in higher education. To bring EL into EE, there is a need for a better understanding of how to support students' learning in terms of achieving aims. This directs the discussion towards learning environments. From the point of view of EL in EE, the key challenge is to create learning environments that make EL accessible to the students. It seems that the educators hold a key position in whether and how EL is transmitted to EE, since they possess the power of creating learning environments. The literature has revealed that when learning outcomes are

examined, complex affective learning plays a major role in EL. Learning outcomes have been widely studied in EE, but more research is needed, especially on long-term and in-depth learning outcomes.

The present dissertation investigates EL in EE in higher education. Accordingly, three research questions were formulated in a bid to address topic areas that remain under-addressed in EE (see Table 1). However, as the main initiative is to focus on EL in EE, the main initiative is to investigate these topic areas of EE. The dissertation, however, may provide insights into the topic areas that remain under-addressed in the context of EL, as they have links to the research questions set for this dissertation.

3 Methodology

3.1 Studied universities and courses

3.1.1 Universities

Finnish higher education consists of two types of institutions: scientific universities (n =13) and professionally oriented universities of applied sciences (n = 23). Within this dual model, the two types of institutions are encouraged to cooperate to better respond to changes occurring in working life and improving the quality of education. In this dissertation, I focus on empirically examining scientific universities by reporting the findings drawn from two multidisciplinary universities: the University of Eastern Finland and the University of Turku. A study of scientific universities allows for an examination of EL in EE in a context where scientific aims are confronted by practice-based aims. Multidisciplinary universities do not focus on research and education in a specific scientific discipline; instead, they cover an array of disciplines.

Study I was carried out at the University of Eastern Finland, which has two main campuses in two different cities, Kuopio and Joensuu, in the eastern part of Finland. The university has approximately 15,500 students and two sets of 500 faculty members in both Kuopio and Joensuu. At the time of the data collection, which was at the end of 2009, Kuopio and Joensuu (including the Savonlinna campus) were distinct universities. The University of Kuopio was established in 1972 and the University of Joensuu in 1969. However, they merged into the University of Eastern Finland as part of the structural reform of Finnish universities. Preparation for this structural reform began in 2007 (Itä-Suomen yliopisto 2015). Four faculties, which were under scrutiny in Study I of the dissertation, were investigated by the faculties within the University of Eastern Finland: philosophy, science and forestry, health sciences and social sciences and business studies. The findings were drawn based on the responses of the teaching- and research-oriented faculty members. Compared with administrative faculty, they are in a key position in terms of the transmission of EE to students because they are responsible for the educational activities. While the University of Eastern Finland has no specific strategy for entrepreneurship, it offers

innovation activities, such as commercialisation projects, which are considered part of the university's societal outreach.

Studies II, III and IV were carried out at the University of Turku, which is located in Southwestern Finland and is one of the largest universities in the country. It has approximately 20,000 students, 3,400 faculty members, seven faculties and five independent units. The faculties are the Faculty of Humanities, Faculty of Science and Engineering, Faculty of Medicine, Faculty of Law, Faculty of Social Sciences, Faculty of Education and Turku School of Economics. The university was established in 1920. The Turku School of Economics, which was established as an independent unit in 1950, merged into the University of Turku in 2010 as part of the structural reform of Finnish universities. The main campus of the university is located in Turku, but it has campuses in the cities of Pori and Rauma. The University of Turku launched itself as a university for entrepreneurship in 2016, with the aim of strategically strengthening entrepreneurial attitudes and supporting entrepreneurial behaviour within its academic community. The university has noted that entrepreneurial behaviour occurs in multiple ways, not only when one is self-employed. The university has taken several initiatives in the field to raise entrepreneurship awareness and enhance education in the field of entrepreneurship. These initiatives appear in many forms, such as education for university faculty members and students, entrepreneurship championing and innovation scouting activities and annually awarding the most notable entrepreneurial act in the university.

3.1.2 Entrepreneurship courses

In this dissertation, I report the findings from two types of entrepreneurship courses. Studies II and III focus on 'for' EE and examine a bachelor-level entrepreneurship course. The course can be considered a typical 'for' entrepreneurship course: the students were expected to set up businesses during the course (see Hytti & O'Gorman 2004). The course under scrutiny was a non-compulsory and highly practice-based university course; it was organised in collaboration with two universities of applied sciences and exemplified cooperation between a scientific university and professionally oriented universities of applied sciences. The university hosted the course. The aim here was to bring students from different disciplines and institutes together to create something meaningful. During the course, the students worked in multidisciplinary teams to set up their ventures. The course content consisted of crafting business ideas, testing different business models and exploiting the ideas in real markets. The course enrolment was open to all students with an interest in entrepreneurship; they were not required to have prior business ideas or experience in entrepreneurship, neither were they required to have

completed entrepreneurship studies before taking the course. This meant that the students came from various backgrounds and had varying levels of entrepreneurship knowledge. From the educators' perspectives, the course relied on team teaching in pairs. The educators (four in total) represented all the engaged institutions and varied based on disciplinary background. The data used in Studies II and III were collected in 2016. During that time, the course was highly popular, and almost 20 student teams attended it. Because of the high number of student teams, the course was divided in two, with afternoon and evening sessions. The business ideas of the teams varied dramatically based on the students' interests: from a webstore of embedded electronics to a design studio.

Study IV focuses on 'through' EE and investigates a compulsory bachelor-level course on corporate entrepreneurship. As a corporate entrepreneurship course, it focused thematically on entrepreneurial behaviour in existing organisations and was aimed at developing the entrepreneurial mindset of entrepreneurship students. During the course, the students were expected to learn the concept of corporate entrepreneurship and its potential benefits and drawbacks in business life. In addition, a focus was placed on its antecedents and a personal assessment of students as entrepreneurial actors. The students came from multidisciplinary and multicultural backgrounds. They consisted mainly of master-level students from the fields of business and engineering, minoring in entrepreneurship, and bachelor-level business students, majoring and minoring in entrepreneurship. The course consisted of interactive meeting sessions and was a typical example of a flipped classroom (see Bergmann & Sams 2014). Before each meeting session, the students were required to read scientific articles and reflect on the content and their learning based on these articles. These articles and reflections were then processed with the use of different pedagogical methods in the meeting sessions to enhance the students' learning. For instance, group work, guided discussions and several additional exercises, such as role play, were used in the meeting sessions. A major assignment of the course was a learning reflection, which the students were encouraged to write systematically throughout the course.

3.2 Mixed-methods approach

3.2.1 Data collection and analysis

I relied on a mixed-methods design. This mixed-methods approach enables the integration of quantitative and qualitative data for both data collection and analysis (Creswell 2014; Hurmerinta-Peltomäki & Nummela 2006). I selected this approach in order to more comprehensively address the aim of the dissertation (see Creswell 2014). In this dissertation, qualitative and quantitative approaches have an equal

status, as emphasis is placed on both (see Johnson, Onwuegbuzie & Turner 2007). The integration of these methods provides a more nuanced understanding of the multifaceted area of EL in EE in higher education. Integration enables opportunities to measure and compare various views and opinions in this multifaceted area and gives voice to individuals, allowing them to share their experiences and learning; this enables the drawing of conclusions to answer research questions more broadly and holistically. While quantitative methods were used in Study I, Studies II and IV relied on qualitative methods. Study III utilised mixed methods with a qualitative and quantitative approach. An overview of the methods in terms of the participants, data collection and analysis are described below and in greater detail in the articles (see Table 3).

Study I is a quantitative study. The data were gathered at the University of Eastern Finland among teaching- and research-oriented faculty members. The questionnaire was drawn from previous questionnaires (Huovinen 2007; Kokkonen 2005; Ukkonen 2004) regarding entrepreneurial attitudes and perceptions of individuals in Finland. In total, 282 research- and/or teaching-oriented faculty members responded to the survey, which was sent to all faculty members (response rate 12%). The respondents comprised professors, researchers, university teachers, lecturers and PhD students. They worked mainly at the Joensuu and Kuopio campuses, and a minority of them worked at the Savonlinna campus. They were located in all four faculties. Most respondents were female, and the average age was 41, varying between 21 and 89 years. The data were analysed using descriptive statistics and a multinomial logistic regression analysis conducted with the help of SPSS. A multinomial logistic regression analysis can be considered an extension of a binomial logistic regression because it allows for the use of a dependent variable with more than two categories (Liao 1994). The dependent variable was the faculty. The independent variables were the respondents' perceptions of their own possibilities in terms of teaching entrepreneurship, the entrepreneurial climate and the quality of EE in terms of entrepreneurial outcomes within their own faculty. The analyses were controlled by the age and gender of the respondents.

Studies II and IV are qualitative in nature. The research material of Study II was gathered through interviews with higher education educators (primary data) and gathering and analysing the planning materials of the course (secondary data). The interviews were semi-structured; the informants were interviewed separately; and a native speaker conducted the interviews in the informants' native language. The interviews lasted from 45 to 90 minutes and were recorded and transcribed. Secondary data from the planning materials of the course comprised the course guide, planned schedule and course marketing materials. The research material was qualitatively examined by following the steps of a thematic analysis, as delineated in Braun and Clarke (2006). First, the research material was read through multiple

times, and initial thoughts and ideas raised in the material were noted. Second, the research material was deductively coded into four categories based on the principles of Vosniadou et al. (2001). Third, the coded data were reviewed and, where needed, refined before the final key features were labelled.

Study IV relies empirically on the learning reflections (10–15 pages each) of two student cohorts. This material comprised learning reflections from 74 students who completed the examined course in the fall of 2015 and the spring of 2017. The learning reflections were used as the research material because they were considered valuable sources of information that could provide rich data on the students' learning processes and outcomes. This choice also follows Rubin and Martell (2009), who contended that an assessment of affective outcomes is typically based on self-reporting. As an ethical procedure, all the participants were informed about the data collection, and all gave their permission for the anonymous use of their learning reflections for research purposes. The analysis of the research material was carried out in stages, drawing on the steps of a thematic analysis given by Braun and Clarke (2006). The lowest level of the taxonomy, 'receiving', was excluded because it was considered to have been achieved through participation in the course. Fourth, to understand the content of the affective learning outcomes from the perspective of EE, the research material was further categorised based on the learning outcomes identified in the EE literature. At each level, the sentences were classified based on the identified EE outcome indicator. Some sentences (e.g. those describing the nature of corporate entrepreneurship [CE]) did not fit the existing EE indicators but remained data-driven learning outcomes.

Study III integrates quantitative and qualitative approaches and, thus, is a mixed-methods study. The mixed-methods approach was used to identify student learning, with a focus on the different types of decision-making logics during the venture creation processes. First, survey data were collected from the students during the course. The survey data comprised three surveys collected via an Internet-aided survey tool administered at different time points. These data were used to analyse the identified decision-making logics (Chandler et al. 2011). Data were combined in a data set comprising 49 responses from 57 students who completed the course (response rate 86%). In the data, the average age of the respondents was 26. Most of them were male; most had completed at least half of their studies mainly in business or technical sciences. A minority of the respondents were international students from different countries. Only seven students had prior entrepreneurial experience.

Second, to gain a deeper understanding of the types of decision-making logics identified and how they evolved during the course, Study III used non-participant observation data. During the data collection process, the students were observed without active participation in their actions. According to Liu and Maitlis (2010), this type of non-participant observation is often used in tandem with other methods

to bring a more nuanced understanding to complex issues. This observation focused on 23 students from six teams whose venture creation processes were eventually followed up on. Based on the results of the survey of the decision-making logics of the students (T1 and T2), the analysis focused on four venture creation processes and the students involved in them. The students were selected because they followed different types of decision-making logics. The objective was to gain a deeper understanding of these logics. The observation data collection took place during bi-monthly meetings in which the students shared their learning and actions (proxies for decision-making). Non-participant observations were recorded in the form of a research diary in a notebook or on a laptop. As an ethical procedure, all participating students were informed of the research during the first meeting of the course, and they gave permission for the use of the material for research purposes.

The survey data analyses were threefold. First, the decision-making logics were analysed using explorative and confirmatory factor analyses (CFAs) to validate their dimensions. The decision-making logics were measured using the Chandler et al. (2011) scale by placing the focus on the constructs of causation and experimentation. Experimentation was defined as a suitable construct for recognising effectuation in this type of course context. To validate the measurement approach, an explorative factor analysis was conducted, and its results were further validated with a CFA. The latent variables were employed in a cluster analysis to identify the students' profiles of decision-making logics (T1 and T2). Thereafter, the differences between each cluster were measured using a univariate analysis of variance (ANOVA) and t-tests (Hair et al. 2010). The analysis of the non-participant observation data focused on the students' decision-making logics and how they rationalised and orally described their actions and related decisions to other students and teams. Most importantly, the focus was on how the students' decision-making logics changed, by seeking a more nuanced understanding of the logics and patterns leading to these transformations. The transcribed observation data comprised 21 pages of text, all of which were carefully analysed. In the critical phases of the process, the first analysis was deductive in nature and sought to identify the causal and effectual decision-making logics; this was carried out based on Fisher (2012). Afterwards, a second, more inductive approach was used to reveal new insights into the identified logics and their transformations during the venture creation process.

3.2.2   Reflection

Even though the mixed-methods approach has been commonly utilised in several fields of science since the late 1980s and early 1990s (see Creswell 2014, 266), its importance had not been acknowledged more generally in the field of entrepreneurship until the twenty-first century (Davidsson 2003). For this

dissertation, the approach was important for examining the multifaceted area of EL in EE at different levels and among its different actors. The aim of the dissertation and its original studies was reached by setting different types of research questions; employing different types of data collection procedures, such as interview, documentary, survey and observation data; and conducting different types of data analysis and drawing different types of findings (see Tashakkori & Creswell 2007).

However, despite the strength of the mixed-methods approach, it comes with certain limitations. Creswell (2014) pointed out that for this approach, there is a need for extensive data collection and an extended time period to analyse the data. The approach also sets requirements for the researcher to be familiar with both quantitative and qualitative approaches. A mixed-methods design is also complex and might need, for instance, visual models to understand the research activities. In the current case, the study period was relatively long, but this was not overly problematic because it allowed for learning and experimentation in the field of research, which are key aspects of being a doctoral researcher. However, while the approach set requirements for me to be familiar with quantitative and qualitative approaches, it allowed little room for me to learn a specific method in an in-depth manner and become an expert in it. This shortcoming was consciously accepted because no single method could have produced an overarching understanding of the topic area. In addition, the mixed-methods approach can turn against itself, providing no generalisable or truly in-depth knowledge.

I considered these limitations to be possible issues, but they were accepted because I see this dissertation as one of the starting points for the examination of EL in EE. A call for further research endeavours is, therefore, evident. With the use of a mixed-methods approach with distinct study contexts within a multidisciplinary university, data collection methods, data sets and analysis methods, the overall methodology may seem trivial. These issues have been discussed in this chapter, and more detailed information regarding the research data can be found in Table 3. In addition to these practical issues, mixed-methods research might engender difficulties in philosophical positions. For instance, scholars have discussed whether it is possible to mix or integrate paradigms. In this vein, pragmatism is often a useful philosophy to support mixed-methods in terms of an epistemological justification and logic (Johnson, Onwuegbuzie & Turner 2007; Tashakkori & Creswell 2007).

Assessments of mixed-methods research have been discussed by scholars (see Creswell & Plano Clark 2007; Dellinger & Leech 2007; Onwuegbuzie & Johnson 2006). O'Cathain (2010) suggested that the quality of mixed-methods research can be evaluated based on the domains of planning quality, design quality, data quality, interpretive rigour, inference transferability, reporting quality, synthesizability and utility.

In the dissertation, I want to reflect on the data quality because it raised the most substantial concerns during the research process. Considering the data collection

methods used in this dissertation – quantitative data collected via an Internet-aided survey tool, interviews and course planning materials, non-participant observations and learning reflections – all of them raised concerns about whether I was dealing with bad and/or insufficient research material. As a researcher, I was constantly wondering whether the data would be non-representative or overly thin. These issues were also discussed with my co-authors.

The issue of non-representativeness was prevalent in Study I, as I noticed from the open-ended questions that entrepreneurship in higher education raised strong feelings for and against. I worried that perhaps my data were overly polarised at opposite ends; however, the data seemed to be normally distributed. I was worried about the thinness of the research material in Study II because I was not gathering additional data, such as observational data, beyond the interviews and course planning materials. However, the interviews and course planning materials as secondary data sources seemed to support each other well. In Study III, the issue was that I was not able to follow the teams whenever they proceeded with their venture creation process because they proceeded on their own time between the meeting sessions, and it would have been impossible to follow their every move. Thus, I depended on their retrospective storytelling. However, the meeting sessions took place relatively often (every second week), and I was not alone with my research material. Co-authorship provided me with the ability to work independently and jointly around the research material as well as share multiple valuable discussions when crafting the original studies.

Another issue regarding the data quality that I was struggling with was my own role in creating the research material – not only as a researcher but also as an educator. This worry was particularly prevalent as I collected the qualitative research material. At the time of this research process, I was conducting and later completed pedagogical qualifications. I believe that because of my increased awareness, I had great difficulty not only diving into educators' pondering in the interviews by feeding my ideals and ideas of how to enhance student learning but also in taking an active role in education when I was doing non-participant observations. I am afraid that I sometimes failed miserably and rushed to help the other educators in the meeting sessions. These difficulties were even more prevalent because I was somewhat familiar with the informants, and they knew me from my role as an educator. However, I quickly noticed this behavioural model and reflected on my own behaviour, after which it became easier to adapt to my role as a researcher. The familiarity with the educators might also have affected the interviews – the informants might have been more open and relaxed; however, they might have considered the appropriateness of what they were saying. This is a phenomenon that many researchers deal with when interviewing individuals, and there is no simple solution. In my case, the semi-structured interviews allowed the informants to speak

from their own point of view. I truly believe that the informants were honest. In addition, I was eager to find the underlying pedagogical assumptions of the educators and the rationale behind the students' decisions – but I quickly noticed that it was naïve to consider that these assumptions will always exist.

There are situations in which a researcher has more than one role at a given time (see O'Reilly & Kiyimba 2015, 56). In Study IV, this situation was even more obvious than in Studies II and III, where I was simultaneously a researcher and an educator. I had difficulty positioning myself – was my main role that of an EE researcher or an entrepreneurship educator of the specific course? I struggled with the fact that everything I said to and did among the students might have affected the research material because I was guiding their learning while conducting the research. I acknowledge that the main graded assignment of the course – the learning reflections – was also my research material. Even though my fellow educator and I did not provide the students with specific instructions on what should be written in the learning reflections, we gave them guiding questions, and they were advised to ponder their learning. The richness of this dissertation is that it relies on multiple types of research material (see Rossman & Wilson 1985). Indeed, the mixed-methods approach helped in providing a more complete understanding of the topic and in reducing my above-described personal biases.

Table 3. Overview of the methods

STUDY THEME	RESEARCH DATA	DATA ANALYSIS
University faculty's perceptions of EE in university	282 research- and/or teaching-oriented-faculty members from the University the of Eastern Finland Data were collected via an Internet-aided survey tool	Descriptive statistics and multinomial logistic regression analysis
Active learning environment for EE in HE: educators' perspective	Primary data: semi-structured interviews of two educators of practice-based 'for' EE course Secondary data: course materials	Thematic analysis by drawing on Braun and Clarke (2006)
Entrepreneurial decision-making logics and their change in EE	Longitudinal survey data (T0-T2) collected via an Internet-aided tool from 49 students of practice-based 'for' entrepreneurship course Non-participant observation of four teams throughout their start-up process	Quantitative: explorative and confirmatory factor analyses, cluster analysis, analysis of variances Qualitative: thematic analysis by drawing on Braun and Clarke (2006)
Affective learning outcomes in EE	Learning reflections of 74 students of a corporate entrepreneurship course in higher education, two student cohorts	Thematic analyses of 74 learning reflections and further in-depth analysis of two learning reflections

4 Overview of the Studies

4.1 Study I

Suomalainen, Sanna, and Hanna Laalo (2015) The views of university staff on the preconditions for entrepreneurship education at the university. Hallinnon Tutkimus Vol. 34 (No. 4), 297–309.

Study I investigated the preconditions for EE in higher education. More precisely, the aim was to examine the subjective perceptions of university faculty members concerning the preconditions for EE. The need for this study stemmed from the fact that although the institutionalisation of entrepreneurship in all disciplinary areas has recently become an important part of higher education policy, the actual grassroots conditions in realising this mission have not been explored. To fulfil this lack of understanding, this study investigated how the university faculty perceived the entrepreneurial climate in the university, whether the faculty members considered teaching entrepreneurship to be natural for them and whether they considered that the formation of cooperative relationships among external networks, such as local companies, was natural for them. In addition, the study compared these preconditions between different disciplinary fields.

Deploying a quantitative approach, the results, which were based on a web-based questionnaire, indicate that the preconditions for EE in higher education are quite inadequate. EE has not achieved a stable position in higher education among faculty members, who perceived an unsupportive climate towards entrepreneurship and EE. The faculty members rationalised that teaching entrepreneurship and bringing the elements of entrepreneurship as part of university education were highly unnatural. They perceived that their knowledge of entrepreneurship was substantially insufficient and not up to date. In addition, the staff members reported that cooperating with external stakeholder groups was not natural to them. They also pointed out that university students do not have a vast number of possibilities when it comes to receiving good tools for entrepreneurship.

The findings, however, indicated that university faculties differ in terms of their views on the preconditions for EE. The members of the Faculty of Health Sciences considered the entrepreneurial climate to be more supportive than their counterparts.

At the same time, they reported that they had less than sufficient and updated information on entrepreneurship. The members of the Faculty of Business Studies and Social Sciences were considered to have the most updated information on entrepreneurship. Interestingly, together with the members of the Faculty of Science and Forestry, they more often perceived that students can have good tools for entrepreneurship during their studies.

In conclusion, the findings reveal that the preconditions differ among the different disciplinary areas regarding EE and its realisation as part of university education. This study confirmed that although the promotion of entrepreneurial culture appears to be a natural extension of higher education goals among policymakers, there is an absence of a unified entrepreneurial culture within higher education. This absence should be taken into consideration among policymakers and academics, both entrepreneurship supporters and opponents. In all, EE has very diverse possibilities of success in higher education, but in general, much remains to be done if EE is to become an established part of the curricula in all fields of higher education.

Keywords: *Entrepreneurship education, university, higher education*

4.2   Study II

Ilonen, Sanna Active learning environment in entrepreneurship education in higher education: educators' perspective. Under review in *Entrepreneurship Education and Pedagogy*. Earlier version published in *Proceedings of the RENT XXXIII Conference.*

This study investigated how entrepreneurship educators create active learning environments in EE in higher education. Pursuing active learning raises challenges for entrepreneurship educators as they seek to create the learning environment in their educational interventions. In order to emphasise active learning, educators should simultaneously design active learning environments and fulfil academic criteria. Moreover, the learning environments should fit heterogeneous student populations. Challenges arise when educators lack the educational expertise and capabilities to create this environment.

Despite the agreement regarding the importance of active learning, there is no consensus as to what an active learning environment means. Through a qualitative approach, this study showed the realities behind the active learning environments of EE. Principles relating to learning environments that facilitate learning (Vosniadou et al. 2001) were selected as the analytical frame because of the long tradition of studies on learning environments in the field of cognitive research, particularly on active learning, which is seen as important in EE. The principles were helpful in

structuring the learning environment literature and practice in EE and in revealing the interplay between them. The findings suggest that an active learning environment in EE constitutes imitation, adjustable co-creation, using a team as an asset for learning and taking advantage of individual differences. Instead of having four separate features, the findings suggest that they formed two intertwined features: an adjustable co-creation within a 'given' format and individuals with complementary skills working in teams.

This study contributed to the existing EE literature by providing a more fine-grained understanding of active learning environments in higher education. This can take place by structuring a discussion on the learning environment and showcasing educators' perspectives, as suggested by some scholars. The findings can be used as a concrete tool in designing a learning environment.

Keywords: *Entrepreneurship education, educator, learning environment, higher education, active learning*

4.3   Study III

Ilonen, Sanna, Jarna Heinonen, and Pekka Stenholm (2018) Identifying and understanding entrepreneurial decision-making logics in entrepreneurship education. *International Journal of Entrepreneurial Behavior and Research* Vol. 24 (No. 1), 59–80.

This study investigated students' decision-making logics during a new venture creation process in EE and how these logics are transformed during the venture creation process. EE has increasingly highlighted the role of the entrepreneurial method (Yamakawa et al. 2016; Fayolle & Gailly 2008; Sarasvathy 2008), which refers to the use of two decision-making logics – causation and effectuation – in responding to diverse challenges that can take place in education (Yamakawa et al. 2016). The decision-making logics were originally proposed to explain entrepreneurs' decision-making; accordingly, there is a lack of understanding regarding the use of effectuation and causation in different contexts, such as in educational contexts (Reuber et al. 2016). The studied context was an optional, 18-week-long bachelor-level course where the students were 'pushed' into uncertainty, requiring them to ideate, test and exploit a business idea through starting a new venture. This kind of setting required the students to take concrete actions, allowing for an investigation into their behaviour during active venture creation.

Through a mixed-methods approach (qualitative and quantitative design), the results showed that the students followed four types of decision-making logics to start with – the effectual, causal, hybrid and coping approaches – each with unique

characteristics adding to existing knowledge in the scholarly field. At the end of the course, the 'pure' effectual and causational approaches had completely disappeared. About half of the students did not emphasise the causal or effectual approach; instead, they reported using high levels of both approaches simultaneously (hybrid approach). Intriguingly, the rest of the students reported using the coping approach with no emphasis on effectuation or causation. The findings also implied that their new venture creation processes were stagnated during the use of this coping approach. The study revealed three patterns of stagnation: uncertainty in how to proceed, unwillingness to proceed and unsatisfactory team dynamics. These dynamics transformed the students' decision-making logics into the coping approach and led them to a stagnated venturing process.

In conclusion, the study emphasised the existence and nature of different decision-making logics during the new venture creation process. More importantly, it illustrated how decision-making logics can transform over time. The findings introduced different transformation patterns that can lead individuals towards coping decision-making logics, during which no causation or effectuation is emphasised. The findings showed that despite this stage of decision-making logics, the process continues: even if no new business ventures are launched, EE still generates learning outcomes that improve students' understanding of entrepreneurship and of themselves as entrepreneurs. The findings can be utilised in designing EE programmes and in planning interventions to support new venture creation processes.

Keywords: *Decision-making logic, effectuation, causation, entrepreneurship education*

4.4   Study IV

Ilonen, Sanna, and Jarna Heinonen (2018 Understanding affective learning outcomes in entrepreneurship education. *Industry & Higher Education* Vol. 32 (No. 6), 391–404.

This study examined students' affective learning outcomes in EE based on the taxonomy of such outcomes and aimed to understand their nature in an in-depth manner. In the field of EE, researchers, educators and policymakers have long attempted to understand and determine whether EE influences students, and many studies have provided anecdotal evidence measuring the outcomes of EE endeavours. There is a particular lack of understanding in relation to affective learning outcomes, such as the beliefs, attitudes, impressions, desires, feelings,

values, preferences and interests of students, all of which are important in generating behavioural change.

By utilising a qualitative approach and building on the taxonomy of affective learning outcomes (Krathwohl et al. 1964), this study identified different types of affective learning outcomes. By acknowledging its deficits, the taxonomy was selected as an analytical frame because it is regarded as one of the most influential works in the field of education. Moreover, the taxonomy can be considered especially valuable in areas where research on affective outcomes is underdeveloped. Based on the students' reports, the study identified four types of affective learning outcomes on CE: CE as a topic, problematising CE, one's own relationship with CE and internalising CE as one's own mode of work. Moving from level I to level IV deepened the level of expertise obtained. The study revealed that the external learning outcomes (CE as a topic and problematising CE) are relatively easy to achieve. The internal learning outcomes (one's own relationship to CE and internalising CE as one's own mode of work) are more difficult to achieve because they require one to take a personal stance towards entrepreneurship or concrete entrepreneurial actions. The findings of this study suggested that only internal affective outcomes are truly meaningful in EE.

The study identified various external and internal affective learning outcomes based on the students' expertise levels. It contributed to the existing EE literature by providing a more fine-grained understanding of these complex affective learning outcomes. As practical implications for educators, the study contributed to the visibility of affective learning in EE and provided insightful information that can be used in programme development.

5 Main Findings and Discussion

I set out to investigate EL in EE in higher education. More specifically, my aim was to investigate whether and if so how EL takes place in EE in higher education. Four original studies, as presented in Table 1 and Chapter 4, formed the research material of this dissertation. Empirically, the dissertation presents findings drawn from two multidisciplinary universities. Study I was carried out among faculty members at the University of Eastern Finland and provided information on the faculty members' perceptions of EE in the higher education context. Studies II, III and IV were carried out at the University of Turku, and they address the learning environment, content and learning outcomes. The findings were drawn from two types of educational interventions in entrepreneurship: 'for' and 'through' EE courses. A more detailed description of the studied universities and courses can be found in Chapter 3.1.

I tackled the aim of the dissertation by analysing the three research questions that formed the basis of the elements of an educational model for entrepreneurship (drawn from Fayolle & Gailly 2008 and supplemented with discussions on the context and learning environment). The first research question asked how EL environments of entrepreneurs are created in EE. All four studies provided input for this research question. The second research question focused on EL content in EE, which was addressed through the findings of Studies II, III and IV. The third research question inquired about EL outcomes that can be achieved in EE. Studies III and IV provided research material to respond to this question.

5.1 EL environments are co-created in EE

There is a growing need to understand learning environment creation in EE (Neck & Corbett 2018). Consequently, the first research question was formulated to focus on how EL environments of entrepreneurs are created in EE, leading to an analysis of the context and learning environment of EE.

By focusing on the special characteristics of EE in higher education, more precisely faculty members' perceptions of EE, the findings revealed the diverse nature of their perceptions in higher education. This is important background information when considering learning environment creation in EE. The findings suggested that EE is perceived very differently among the various faculties. For

instance, in the studied university, the faculty members in the field of health and business had a more favourable perception of EE. Moreover, business faculty members seemed to have had the most accurate information about EE. This contextual diversity within an institution is important to bear in mind because it can shape the education that takes place among these faculty groups. It is especially important to consider the era of diffusion of EE, when entrepreneurship is encouraged within different academic fields in higher education institutions. In practice, this means that faculty members with different preconceptions encounter entrepreneurship in their work. Some non-business faculty members might even be asked to engage in educational activities and entrepreneurship courses. This was demonstrated in Studies II and III, where the educators represented different disciplines and subjects, such as arts and culture.

The findings revealed the importance of co-creation when creating learning environments that represent those of entrepreneurs: EL environments in EE are co-created with educators and students. The co-creation of learning has been defined as the collaborative actions of faculty members and students to create the various aspects of education (see Carey 2013; Bovill et al. 2011; Cook-Satcher 2011). According to the literature, these aspects can take a variety of forms. It can mean evaluation of course contents and learning processes, design of course contents, conducting research together or assessment design and participating in assessments (Bovill et al. 2016). The co-creation approach challenges the idea that decision-making regarding teaching- and learning-related aspects is an area meant only for faculty members (see Mann 2008). The findings suggest that without educators, no formal EL environments can exist in EE. This is a key difference when comparing EE with automatically formulated learning environments of entrepreneurs. The findings revealed that it depends heavily on educators as to whether the learning environment will be compatible with EL and, if so, how; whether students can self-regulate their learning in the same way as entrepreneurs; whether they can obtain information regarding entrepreneurship that is relevant to them and whether they are allowed and encouraged towards self-fulfilment activities in the context of entrepreneurship. The findings indicated that the students' role in co-creation is to give feedback and communicate their needs so that the learning activities can be modified accordingly. The findings also showed that feedback can take a variety of forms: in the studied context, feedback was not always in oral or written form but something that the educators were able to "sense air" based on the students' behaviour. The educators were alert in supporting the students' learning if they noticed that the students had not understood something or needed extra support with their idea or team. This implied that the emphasis on allowing the learning environment to evolve based on the students' learning processes brings EE closer to EL, where the learning environment is created from an entrepreneur's situation. In

addition, the role of teams and team members with complementary skills was highlighted as the students worked in teams. This brought the students closer to the practice of being an entrepreneur: the educators supported learning by trying to allow the students with the best possible premises to succeed in learning while also considering that entrepreneurs rarely set up businesses independently of others and are often surrounded by a team. The educators, however, did not consider that the team members could be a source of demotivation, ultimately hindering EL in EE. Some of the students quit the intervention under scrutiny. The support from team members was also important from the point of view of the students' venture processes because, like EL, their ventures took place in real markets, although the intervention allowed them to learn with very low risk.

The findings highlighted that the co-creation of EL environments is a challenging endeavour in higher education. The findings showed that entrepreneurship educators and students come from diverse backgrounds, further contributing to this challenge. Learning environments are co-created with very diverse expertise, understandings and experiences of entrepreneurship, and resources are often scarce. Similar to Béchard and Grégoire (2005), the findings suggested that educators might be lacking important expertise that would help in the creation of EL environments. This expertise can be educational or content-related. The findings also revealed that these learning environments can be reproduced unchallenged, again engendering concern that educational traditions are built on and sustained without thorough consideration.

5.2 EL content in EE consists of knowledge, action and reflection

There is a need for further investigations into how to support achievement of different aims in terms of learning of students in different educational settings (Lackéus & Sävetun 2019). Accordingly, the second research question focused on EL content in EE. In investigating this, the dissertation concentrated on examining the content in 'for' and 'through' entrepreneurship interventions.

The findings of the dissertation revealed that EL content in EE consists of 1) theoretical knowledge of entrepreneurship, 2) activities that require acting entrepreneurially and 3) a reflection of the aforementioned aspects in relation to each other in developing subjective stocks of knowledge. The aim of an entrepreneurship intervention determines the nature of the theoretical knowledge and activities. EL in EE comes close to the learning of entrepreneurs, who, according to Minniti and Bygrave's (2001) characterisation of EL, update their market-specific knowledge and entrepreneurial knowledge based on experience. One important difference is that the knowledge that students of entrepreneurship gain is likely to be more theoretical due to the higher education context in comparison with the knowledge learnt by

entrepreneurs. In addition, it must be remembered that the students under scrutiny were not operating in businesses that exclusively determined their living, which is often the case for entrepreneurs.

As the interventions under scrutiny had different aims, one focused on new business creation and other on corporate entrepreneurship. In these courses, the students developed their knowledge of entrepreneurship from the perspectives of the interventions (new business creation, corporate entrepreneurship) and the activities conducted and then reflected on their knowledge and activities in relation to each other. The new business creation intervention was an example of EL content where the students engaged in self-regulated learning by setting up new ventures in teams. The content focused on entrepreneurial decision-making, a key issue in the EL literature. They also gained knowledge about their customers, markets, stakeholders, product and decision-making in general, and they used this knowledge as they participated in activities. The findings suggest that different forms of decision-making logic – effectual, causal, hybrid and coping – can be observed not only among experienced entrepreneurs but also among students. The evolution of these decision-making logics during the venture creation processes indicated that, similar to the experienced entrepreneurs, the students based their decision-making on their existing knowledge. Once they had acquired the general knowledge of entrepreneurship, they made a decision and saw and reflected on the outcomes in relation to this knowledge, thereby shaping their subjective stocks of knowledge. Again, this was similar for the entrepreneurs, who modified their stocks of knowledge based on their actions and reflection of the outcomes of their actions. The findings confirmed that educational interventions can facilitate EL, although it must be acknowledged that the decisions made by the students might differ from the potential decisions of more experienced entrepreneurs, who might have gained a wider and better quality of knowledge by making, repeating and reflecting on their decisions. This demonstrates the subjective nature of EL and the importance of knowledge in entrepreneurship.

The findings of this dissertation showed that EL content can also take place in educational interventions that do not focus specifically on venture creation. The findings also indicated that the students learned to act entrepreneurially, even if the teaching focused on corporate entrepreneurship. In the corporate entrepreneurship educational intervention under study, the students learned theoretical knowledge on what corporate entrepreneurial behaviour means, why it is important and how it can be facilitated at the organisational and individual levels. This theoretical knowledge on entrepreneurship in existing organisations helped them formulate a basic understanding of the matter. This crucial knowledge, however, was not sufficient in facilitating EL; it needed to be complemented with participation in activities, where the students could train their own corporate entrepreneurship in practice. When

knowledge on the subject matter and the activities were reflected on in relation to each other, the subjective stocks of knowledge developed, which is a learning outcome of EE.

The findings demonstrated that in addition to learning from their own actions, rather similar to EL, the students learned through vicarious means from the actions of others. Vicarious learning motivated the students in their own activities and reflections of how to act entrepreneurially, thus supplementing EL. The educators mentioned that the role of discussion and learning from other teams had become increasingly important in the educational intervention, with a focus on new venture creation. The findings showed that learning through vicarious means in the form of guest speakers (experienced entrepreneurs and corporate leaders) enhanced the students' learning in the educational intervention, which focused on corporate entrepreneurship. This occurred through a similar type of process whereby the students first acquired theoretical knowledge, learned from the actions of others and then reflected these in relation to their current subjective knowledge.

The findings of this dissertation highlighted that EL content can be embedded into different types of learning environments and activities in the field of entrepreneurship. Thus, EL did not depend on the type of educational intervention (such as new business creation). Despite the different foci, the learning content encompassed similar aspects in both of the studied educational interventions. A crucial starting point in EL content is that the intervention should develop knowledge of entrepreneurship as a subject matter, though the exact content of this knowledge depends on the focus of the intervention. However, it is not sufficient to only acquire theoretical knowledge of entrepreneurship; it is also important to conduct entrepreneurial activities (often requiring them to step out of their comfort zones). Following this, the students must reflect on these activities and knowledge in relation to each other, which is how their subjective stocks of knowledge develop. The educators created possibilities for EL content, but the students were responsible for creating their learning processes. Some of the students were not interested in acquiring theoretical knowledge and put no effort into the entrepreneurial activities or reflect properly on what these activities and knowledge meant in terms of concurrent knowledge. Thus, EL did not occur on their behalf.

5.3   Entrepreneurial devotion is an EL outcome in EE

There is a growing need for understanding of in-depth and long-term learning outcomes in EE (Nabi et al. 2017). Accordingly, the third research question focused on the EL outcomes achieved in EE. These learning outcomes are expected to have a major effect on student behaviour in terms of entrepreneurship. EL scholars have

noted the importance of affection in the development of learning outcomes, and this dissertation focused on the role of affection in the development of EL outcomes.

Through an examination of an educational intervention focused on corporate entrepreneurship, the dissertation succeeded in revealing different types of learning outcomes. An examination of these outcomes presented entrepreneurial devotion as an important EL outcome, which means that an individual internalises and commits to entrepreneurship in an existing organisation or in a business start-up. This type of outcome is powerful and has a profound effect on the individuals involved. However, because of the individual beliefs, attitudes and emotions that culminate in the development of devotion, developing this subjective learning outcome requires high personal input on the part of students. Personal input cannot be outsourced, and thus, this EL outcome cannot develop without active engagement and pondering. Compared with the EL of entrepreneurs, this type of learning outcome is more difficult to achieve among students. The findings revealed that a classroom setting might not always be sufficient for achieving truly meaningful, in-depth affective learning because the development of this type of learning outcome often requires considerable reflection (e.g. personal experience of entrepreneurial behaviour in a real-world setting). The students might be lacking in this important reflective surface, which highlights the role of active participation and engagement in reflection geared towards obtaining theoretical knowledge. In educational interventions that focus on new venture creation, this might be easier because the intervention itself produces an ongoing reflective surface; thus, its effect might be instantaneous. For instance, the corporate entrepreneurship intervention under scrutiny completely changed John's mode of work. He realised that entrepreneurship was a way for him to be more satisfied with his current and upcoming jobs giving also companies possibilities to perform better. Study IV gives examples of students' devotion in a more in-depth manner.

The EL literature has acknowledged that failures and problems present higher-level learning outcomes. The present dissertation showed that EE interventions can generate experiences from the failures and problems that students encounter when they take the initiative to act entrepreneurially. About half of the students in an educational intervention focusing on venture creation ended up to a point where their new venture creation processes stagnated. The failures of the student teams were caused by doubts about how to proceed, unwillingness to proceed and unsatisfactory team dynamics. All of these issues indicated that participation in the educational intervention produced knowledge relating to the students' own beliefs, attitudes and emotions as entrepreneurial actors. These factors shaped their abilities and devotion to their entrepreneurial endeavours. Intriguingly, even in a stagnated state, the production of the EL outcome continued. Some argued that their entrepreneurial devotion increased, even though the particular venture creation stagnated. Overall,

this dissertation indicates that the value placed on the possibility of failing 'safely' and encountering problems – and then learn from these failures and problems as part of EE – has been inadequate.

The findings of the dissertation acknowledge the differences between EE and EL in terms of learning outcomes. Despite the successfulness of the educators in learning content and environment creation, the stakes were often different in EE compared with EL. As the students did not invest their own savings in their business ventures, did not raise considerable loans to fund their venturing processes or were not at risk of losing their jobs; thus, they could alter their level of engagement in the new venture creation process. They became creators and actors of the learning process, and their motivations and individualistic learning goals differed (see Hytti et al. 2010). Indeed, it seemed that some of the students were 'all in', while others were 'only' gaining study points. Naturally, those students who were not devoted to learning did not become devoted to entrepreneurship.

5.4   Discussion

The aim of this dissertation was to study whether and if so how EL takes place in EE in higher education. A starting point was the educational model for entrepreneurship (see Figure 1). The dissertation examined the elements of the model from different perspectives. I focused on context, content, learning environment and learning outcomes individually, allowing me to understand whether and to what extent EL can take place in EE. The key findings of the dissertation are presented as an educational model for EL in EE (Figure 2). The educational model sheds light on key characteristics of each element in understanding what EL in EE in higher education actually entails. The findings show that EL can take place in EE in higher education. EL in EE is a process whereby theoretical knowledge of entrepreneurship is learned, and entrepreneurial activities take place and are reflected in relation to each other to develop subjective stocks of knowledge, through which entrepreneurial devotion develops. The development of subjective knowledge stocks is an EE learning outcome, while entrepreneurial devotion is an EL outcome.

EL in EE is dependent on the content as well as the learning environment. The EL environment in EE is characterised by co-creation, meaning that educators and students interact to create the learning environments together. Because of this co-creation, a student should be called a learner in EL in EE, where this student should play an active role. Although educators play an important role in the creation of the learning environment, a learner's role cannot be undermined: learners gain theoretical knowledge of entrepreneurship, conduct entrepreneurial activities and reflect on these activities and knowledge in relation to each other in order to develop subjective stocks of knowledge, through which an EL outcome can be achieved.

Importantly, learners also expose educators to feedback that is crucial in the creation of an EL environment. In short, learners are the creators and actors of the learning process and co-creators of the learning environment. Self-regulated learning, which characterises EL environments, gives learners the freedom to control the learning process. Self-regulated learning can be difficult from a learner's perspective, and it has been argued that there should be a progressive increase in the self-regulation of learners; otherwise, learning will not be enhanced (see Vermunt 2007). Learners can also easily and deliberately abuse this freedom.

As in EL, truly meaningful learning outcomes can shape and change the behaviour of learners in EE. The dissertation reveals entrepreneurial devotion as an EL outcome in EE in higher education. This means that learners internalise and commit to entrepreneurship as their mode of work in an existing organisation or in a business start-up. Entrepreneurial devotion is highly subjective and powerful and cannot materialise in the absence of learner engagement. Entrepreneurial devotion shares similarities with entrepreneurial passion, which illustrates positive feelings and the identities of individuals and teams in entrepreneurship (see Cardon et al. 2017).

The elements of the educational model for EL in EE are bundled, which means that a decision made in an element affects the other element. The context affects the content of education. Conversely, the learning environment is created based on the content. Indeed, the EL environment is an important determinant of an EL outcome. The context can be characterised by different, often contradictory conceptions of EE. EE, especially its practical nature, can encounter mixed perceptions within a higher education institution. In the dissertation, I suggest that the effect of context influences other elements. The existence of the EL content depends on the educator, whose orientation towards education and his/her skills, competences and understanding regarding entrepreneurship determine the content. The roles of learners and educators vary in terms of the elements of an educational model for EL in EE. Delving deeper into Figure 2, the learner's role increases, while that of the educator decreases. The educator has a more fundamental role in determining the context because she/he is often a permanent member of the community. The educator also plays a prominent role in deciding the content of education through the learning objectives. Both educators and learners play important roles in the co-creation of EL environments. Finally, the learner plays a crucial role in determining whether the EL outcome, entrepreneurial devotion, develops. The level of self-regulation also determines whether EL takes place in EE. If an educator maintains control without giving learners the possibility to control their learning, and if learners are unwilling to participate in co-creation and take self-regulation seriously, then EL in EE cannot materialise.
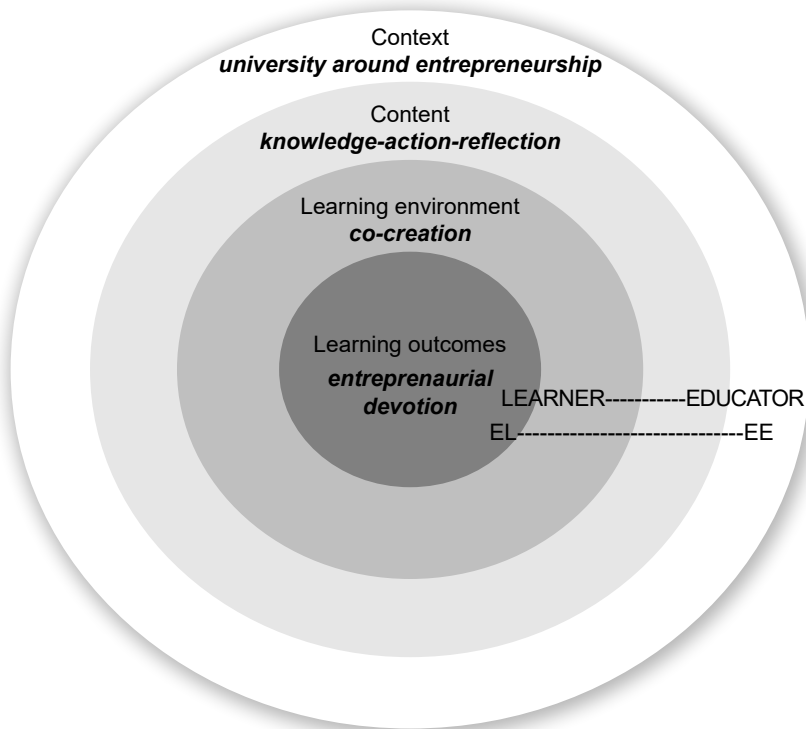
Figure 2. Educational model for EL in EE

A summary of the findings of this dissertation:

1) *EL in EE in higher education can be defined as a process where theoretical knowledge of entrepreneurship is learned, entrepreneurial activities take place, and these activities and knowledge are reflected in relation to each other to develop subjective stocks of knowledge, through which entrepreneurial devotion develops.*

2) *EL can take place in EE, and context, content, learning environment and learning outcomes determine how this can happen.*

3) *The elements of the education model are bundled, and the roles of educators and learners vary in the elements.*

In all, EL can be transferred to an educational context. EL in EE is not 'just' a simulation or caricature of EL (see Pittaway et al. 2015); it is something that does truly occur.

5.5 Theoretical contributions

The overall theoretical contribution of the dissertation is understanding whether and how EL takes place in EE in higher education. In line with Hahn et al. (2017), the findings have shown that EL can take place in EE in higher education. In the present dissertation, this is not a taken-for-granted assumption (see Kurczewska et al. 2018) or a way of discussing EL in EE 'only' as a simulation (see Pittaway et al. 2015). The dissertation provides a definition for EL in EE, that is, a process whereby theoretical knowledge of entrepreneurship is learned, and entrepreneurial activities take place and these activities and knowledge are reflected in relation to each other to develop subjective stocks of knowledge, through which entrepreneurial devotion develops.

Theoretically, the present dissertation takes a holistic view of EL in EE by introducing an educational model for EL in EE. The dissertation suggests that EL does not take place automatically in EE and that certain conditions in the elements of an educational model must first be met, which are underscored in this dissertation. Moreover, the elements cannot be separated from each other; they must be discussed jointly to produce an in-depth understanding of learning. One of the theoretical contributions is to produce knowledge about the role of control in learning. EL in EE does not occur if an educator is incapable of giving a learner the possibility to control his/her learning (see Gibb 1996), and a learner must take this responsibility. Moreover, interestingly, EL can take place not only in 'for' entrepreneurship educational interventions but also in other types of interventions, such as CE interventions, in the field of entrepreneurship.

This dissertation provides a new understanding of the special characteristics of EL in EE in a higher education setting by discussing the diversity of understanding, knowledge and capabilities related to entrepreneurship among higher education faculty members in different fields. This diversity shapes the ways in which education and educational interventions, here EL in EE, take place. Theoretically, the dissertation suggests a more balanced view of learning content by showing the importance of theoretical knowledge, entrepreneurial activities and the role of reflecting on these aspects in conjunction. This finding suggests that diversifying 'about', 'for' and 'through' EE in EL is factitious. This dissertation provides insights into how EL environments are co-created by acknowledging the important role of entrepreneurship educators (see Neck & Corbett 2018). Moreover, the dissertation has initiated a discussion on the role of learners' as co-creators of learning environments. This avenue has not been prioritised by EE scholars but has been acknowledged in the literature on education (Bovill et al. 2016; Carey 2013; Cook-Satcher 2011). The present dissertation also acknowledges the possibilities and challenges of learners' active role in highly self-regulated EL environments.

As suggested by Nabi et al. (2017), this dissertation has produced knowledge about in-depth learning outcomes by showing the importance of learning outcomes, which are affective by nature. This supports the findings from the EL literature (see Fang He et al. 2018; Cope 2011, 2005). The dissertation presents entrepreneurial devotion as an EL outcome in EE. The development of this EL outcome requires high personal involvement from learners, making the outcome highly subjective.

Altogether, the dissertation has shown that the EL literature can contribute to the EE literature; however, the findings have also produced more knowledge for EL studies. Developing a more comprehensive understanding of the new venture creation process, especially examining the decision-making logics within the process, has been seen as an important field of study by entrepreneurship scholars. By investigating the decision-making of student entrepreneurs, this dissertation was able to produce valuable information about the learning of students within their venture creation processes. The dissertation also provided information on how different decision-making logics transform in different contexts and temporal settings and how the approaches of causation and effectuation can be utilised simultaneously (hybrid approach) or remain deemphasised (coping approach). Contributing to the literature on venture performance and EL from critical events, the dissertation has also revealed three different patterns that lead to venture stagnation.

5.6   Practical implications

The practical implications of the dissertation are to describe what EL in EE is and present the educational model for EL in EE. Even though the study has not been created exclusively from an educator's perspective, the practical implications are the most evident for the educators. Educators can utilise both the definition and model in curriculum and course design. Having shown the important role of educators in the co-creation of EL environments, the present dissertation has revealed the need for reflective approaches as well as for raising educational awareness among educators. This can happen, for instance, through pedagogical training, which should be supported by management and peers in every higher education institute. Pedagogical training should seek to prevent the design of a learning environment as blind reproductions of 'rituals' (see Farny et al. 2016), bereft of connections to the actions of entrepreneurs and theoretical knowledge. In addition, it is important to evaluate educators' capability to teach in EE, especially when educators come from diverse fields and have different experiences. It serves no purpose to involve educators who have very defective theoretical and/or practical knowledge about entrepreneurship in EE.

The findings acknowledge the active role of learners. Learners cannot externalise their learning. Thus, educators should be encouraged to push for students to take part in the co-creation of EL environments, especially in their role as creators of their learning processes. One way of making this more explicit would be to include the importance of self-regulation and student engagement in programme and course guides and reiterate this in meeting sessions. The findings of this dissertation show that EL in EE is highly subjective because of diverse stocks of knowledge. Thus, learners' reflections of their learning play a crucial role in EL. As a result, reflection should be trained throughout education.

This dissertation suggests that it is important for educators to acknowledge the role of affection, its complexity and how to address affective learning outcomes. Entrepreneurial devotion as an EL outcome can easily be overlooked compared with cognitive learning outcomes, which are easier to measure and are not considered a 'personal' aspect of learning. The findings call for educator training in acknowledging the affective side of learning as part of EE. Moreover, the findings show that EE can provide important theoretical knowledge that can be useful for entrepreneurs in their venture creation processes and learning. Theoretical knowledge can serve as a basis to help entrepreneurs interpret their own actions, and thus, the findings call for closer collaboration between entrepreneurs and entrepreneurship researchers and educators.

5.7 Limitations and future research

Despite its merits, this dissertation has some limitations. It provides an understanding of whether and how EL takes place in EE in higher education. It introduces an educational model for EL in EE. It investigates each of the elements of this educational model individually. However, the findings have given insights into how the elements of the educational model for entrepreneurship in EL in EE are bundled. One crucial limitation is that the analyses do not cover the interwovenness of the elements in-depth and the elements together. Studying the connections in and between the elements more deeply from various points of view, such as in the context of an educational intervention in a higher education institute, could be a promising future research direction. Also, the role of co-creation and the emphasis on roles in the elements between educators and students could be further examined in terms of how co-creation comes into existence and how it can be enhanced in EE.

The findings shed light on learners' entrepreneurial devotion as an EL outcome in EE. The dissertation, however, does not provide an in-depth analysis of entrepreneurial devotion as a concept. Delving into this concept – especially from the point of view of what it means, how it comes into existence and how it can be measured in EE – serves as a promising future research direction. Educators might

be struggling with how to turn apathetic students into devoted learners. Could, for instance, a more prevalent understanding of the most powerful reflective practices provide an answer to this struggle?

Although the dissertation relied on extensive qualitative and quantitative research material, it builds on specific empirical examples, and only two educational interventions were examined. Learning might require a longer period than a single educational intervention, so it is important to conduct longitudinal analyses to gain a clearer picture of EL. This would provide more detailed information about how and when learning takes place. In addition, more wide-ranging studies of whether the results are typical only for the examined course contexts or whether they can be transferred to other EE contexts are needed. In addition, the dissertation has empirically examined EL among EE degree students. The findings, however, indicate that entrepreneurs could also benefit from the theoretical knowledge gained as part of EE studies in higher education. Future research could examine more in-depth EL as part of executive programmes.

This dissertation was conducted as part of formal education. However, the importance of informal and non-formal education/learning has been pointed out by scholars (e.g. Williams Middleton et al. 2019; Pittaway et al. 2015; Pittaway et al. 2011). An in-depth investigation of the personalised outcomes of combining different types of education (see Williams Middleton et al. 2019), such as joining entrepreneurship societies or actively participating and constructing large entrepreneurial events as part of the educational journey in higher education, may also serve as a possible future research direction. In all, I hope that the findings of this dissertation encourage entrepreneurship educators to strive to produce quality EL in EE, especially by giving learners opportunities and encouraging them to take ownership of their learning processes.

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