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Doctoral thesis

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Summary

This thesis explores how students learn *through* entrepreneurship by experiencing and coping with learning challenges in action-based entrepreneurship education (EE). Action-based approaches comprise experiential learning principles, emphasising hands-on entrepreneurial activities and real-world problems. Such training exposes students to the messy and complex nature of entrepreneurship that creates uncertainty and ambiguity. Teamwork has become an integral learning structure in this approach as teams reflect the working environment of entrepreneurs.

Previous research on learning *through* entrepreneurship reveals interesting and somewhat contradictory effects. On the one hand, action-based approaches have been found to have positive effects on student learning. On the other hand, studies suggest that this type of learning is demanding for students, often giving rise to negative emotional experiences. This thesis explores the phenomenon of *learning challenges* in action-based EE and how students learn from coping with such challenges. This research answers the call for more investigation on *how* students learn in EE, as to date, research has been overly focused on outcomes and effects. Accordingly, this thesis applies a process approach exploring learning from the student perspective.

The research question is addressed through four papers. Paper I is a pilot study that applies the concept of liminality to analyse student team learning through challenges. It also suggests how liminality can provide a language to enhance learning and creativity for teams working in complex and uncertain contexts. Paper II explores the phenomenon of learning challenges in action-based EE and how students experience and cope with the various challenges they encounter. The Paper discusses when and how students themselves find coping mechanisms in a learning environment where they are pushed to the outer boundary of their proximal developmental zone. Paper III applies process data to explore how different time frames (short-term and long-term) influence types of conflicts and conflict management in entrepreneurial student teams. The 'conflict learning loop' illustrates the differences between the two types of teams and how different conflict management approaches further influence team dynamics. Paper IV explores the potential of transformation in learning *through* entrepreneurship by seeing the process of becoming entrepreneurial as a liminal process. The Paper

illustrates how students' 'liminal capacity' – an openness to engage in learning challenges "filled with uncertainty" can support the development of 'liminality competence' and thus transformative learning in EE.

The cover essay provides a conceptual and theoretical background for discussing the papers' findings and the overall contribution of the thesis. This thesis makes three main contributions to the literature on entrepreneurial learning and EE. First, it adds to the entrepreneurial learning literature by suggesting a loop model that illustrates the temporal, emotional and social dimensions of student learning processes that are lacking in experiential learning theory. Second, through the concept of liminality, this thesis contributes a new perspective to explore, understand and facilitate learning processes where students are exposed to complexity, uncertainty and ambiguity.

Third, the thesis adds to the discussion among EE scholars on student readiness for self-directed learning by conceptualising the ambiguous role of learning challenges in the context of action-based EE, and by showing how students themselves find mechanisms to deal with challenges. Here, co-learners play an essential role. Therefore, this thesis suggests that exposing students to demanding learning challenges enhances learning if it happens within a learning environment where the students understand each other as the most important resource for knowledge, support, reflection and learning.

Sammendrag

Denne avhandlingen utforsker hvordan studenter lærer *gjennom* entreprenørskap ved å erfare og håndtere læringsutfordringer i aksjonsbasert entreprenørskapsutdanning. Aksjonsbaserte tilnærminger tar utgangspunkt i prinsippene fra erfaringslæring og vektlegger praktiske entreprenørielle aktiviteter og reelle problemer. Denne type utdanning eksponerer studenter for kompleksitet, usikkerhet og tvetydighet som kjennetegner entreprenørskap. Teamarbeid har blitt en integrert læringsstruktur i denne tilnærmingen ettersom de fleste entreprenører arbeider i team.

Tidligere forskning på læring *gjennom* entreprenørskap avdekker interessante og til dels motstridende effekter. På den ene siden har aksjonsbaserte tilnærminger vist seg å ha positive effekter på studenters læring. På den andre siden tyder studier på at denne type læring er krevende for studentene og gir ofte opphav til negative følelsesmessige reaksjoner. Denne avhandlingen utforsker fenomenet læringsutfordringer i aksjonsbasert utdanning og hvordan studenter lærer av å håndtere slike utfordringer. Forskningen svarer på behovet for mer kunnskap om *hvordan* studenter lærer i entreprenørskapsutdanning, ettersom forskningen til nå i hovedsak har sett på resultater og effekter. Avhandlingen fokuserer derfor på læring*sprosesser* sett fra studentperspektivet.

Forskningsspørsmålet behandles gjennom fire artikler. Artikkel I er en pilot-studie som anvender konseptet *liminality* for å analysere hvordan studentteam lærer gjennom utfordringer. Artikkelen foreslår at liminality kan være et verktøy for å forbedre læring og kreativitet for team som jobber med komplekse problemstillinger der de må forholde seg til usikkerhet. Artikkel II har som mål å utforske fenomenet læringsutfordringer i aksjonsbasert entreprenørskapsutdanning, og hvordan studentene opplever og takler de ulike utfordringene de møter. Artikkelen diskuterer når og hvordan studentene selv finner mestringsmekanismer i et læringsmiljø hvor de blir presset til yttergrensen av sin 'nærmeste utviklingssone'. Artikkel III bruker prosessdata for å utforske hvordan ulike tidsrammer (kortsiktig og langsiktig) påvirker typer konflikter og konflikthåndtering i entreprenørielle studentteam. 'Konfliktlæringssløyfen' illustrerer forskjellene mellom de to typene team, og hvordan ulike konflikthåndteringsmetoder påvirker den videre teamdynamikken. Artikkel IV studerer det transformative læringspotensialet i

aksjonsbasert entreprenørskapsutdanning ved å utforske veien mot å bli entreprenøriell som en liminal prosess. Artikkelen illustrerer hvordan studentenes 'liminale kapasitet' – en åpenhet for å engasjere seg i læringsutfordringer «fylt med usikkerhet» kan støtte utviklingen av 'liminal kompetanse' og dermed transformativ læring i EE.

"Kappen" gir en konseptuell og teoretisk bakgrunn for å diskutere funnene i de fire artiklene og det overordnede bidraget til avhandlingen. Den peker på tre sentrale bidrag til litteraturen om entreprenøriell læring og entreprenørskapsutdanning. For det første bidrar den til litteraturen om entreprenøriell læring ved å foreslå en 'loop-modell' som illustrerer de tidsmessige, emosjonelle og sosiale dimensjonene til studentenes læringsprosesser som mangler i erfaringsbasert læringsteori. For det andre, gjennom konseptet liminality, bidrar avhandlingen med et nytt perspektiv for å utforske, forstå og legge til rette for læringsprosesser der studentene blir eksponert for kompleksitet, usikkerhet og tvetydighet.

For det tredje bidrar forskningen til diskusjonen om studenters evne til selvstyrt læring ved å konseptualisere den tvetydige rollen læringsutfordringer har i aksjonsbasert entreprenørskapsutdanning. Videre viser den hvordan studentene selv finner strategier for å håndtere utfordringer. Her spiller medstudenter en helt sentral rolle. Avhandlingen antyder med dette at å eksponere studenter for krevende utfordringer fremmer læring når det skjer innenfor et læringsmiljø der studentene forstår hverandre som den viktigste ressursen for kunnskap, støtte, refleksjon og læring.

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Trondheim, January 2024
Sigrid Westad Brandshaug

Table of Contents Part I – Cover Essay

List of Tables

List of Figures

PART I: THESIS COVER PAPER

1.0 Introduction

1.1 Research Problem and Questions

This thesis concerns how students learn from experiencing and coping with learning challenges in action-based entrepreneurship education (EE). There is broad consensus that EE prepares individuals to cope more readily with uncertainty, non-routine tasks and continuous change (Arpiainen & Kurczewska, 2017; Hägg & Gabrielsson, 2020; Neck & Corbett, 2018). Action-based approaches, including hands-on entrepreneurial activity and real-world problems, are best suited for this purpose (Kassean et al., 2015; Pittaway & Cope, 2007a). Additionally, teamwork has become an integral learning structure in EE because teams reflect the real-world entrepreneurship working environment (Karlsson & Nowell, 2021).

However, what makes the learning situation in action-based EE relevant in terms of authenticity, complexity and uncertainty also renders it challenging for students. Entrepreneurial activities are often associated with high stress, multiple obstacles and high uncertainty regarding outcomes (Politis & Gabrielsson, 2009; Shepherd et al., 2000). These challenges, in this thesis labelled *learning challenges*, are highly present in action-based EE, where students learn through performing entrepreneurship (Rasmussen & Sørheim, 2006). This thesis aims to identify key aspects of student learning through challenges in an action-based learning environment in order to "unpack" essential structures and dynamics that promote student learning.

EE scholars have already pointed to several positive and negative effects of exposing students to challenges in action-based approaches. For instance, how engaging in authentic and team-based entrepreneurial activities can increase the development of entrepreneurial competencies (Barr et al., 2009; Lackéus, 2014) and strengthening student learning through teamwork (Arpiainen & Kurczewska, 2017; Steira, 2022). On the other hand, previous studies show how teamwork in the EE context can create difficulties (González-López et al., 2019; Lackéus, 2014) and that students find action-based approaches emotionally demanding (e.g. Lackéus, 2013; Pittaway & Cope, 2007b). Encountering challenges in the entrepreneurial process can reduce the motivation to engage in entrepreneurial activity in the future (Bandera et al., 2020). The

EE literature is, therefore, inconclusive regarding how to improve the positive effects of action-based EE.

The majority of research studies have focused on the impact and effect of EE (Nabi et al., 2017), hence little is known about how learning actually develops in this particularly challenging learning context, including what works and does not work (Crosina et al., 2023). EE has seen a shift towards more student-centred approaches as opposed to teacher-led ones, as well as an increasing interest in student learning processes. One reason may be that educators recognise that they are less in control of what and how students learn in student-centred approaches (Aadland, 2019). However, to date, student learning has mostly been explored from the educator's perspective (e.g. Engel et al., 2016; Neck & Corbett, 2018). Therefore, there still remains much to discover about student learning from the student perspective. Thus, to further enhance the quality of action-based EE, there is a need for *process studies* that explore how students themselves experience, cope with and learn from various challenges as part of this approach.

The overall research question for this thesis is therefore:
How do students learn through action-based entrepreneurship education?

The question is further explored through three sub-questions focusing on 1) the phenomenon of learning challenges, 2) the underlying structures and dynamics that promote learning in action-based EE, and 3) liminality as a theoretical lens that supports exploration and understanding of these complex and dynamic learning processes.

Learning challenge is a core phenomenon in this thesis and is defined as emotionally demanding experiences related to the entrepreneurial process characterized by complexity, ambiguity and uncertainty. This research is based on the assumption that we learn by being challenged (Dewey, 1938; Mezirow, 1997; Meyer & Land, 2006) and that critical events foster entrepreneurial learning (Cope, 2003; Cope & Watts, 2000). Such situations stimulate critical reflection and require the individual to try out new behaviours (Funken et al., 2020). However, individuals differ in their ability to learn from challenges (Meyer et al., 2008; Politis, 2005a), and to date there have been few attempts to explore this variance in the field of EE in depth. As argued by Aly et al.

(2021), we know that entrepreneurship is an emotional activity; what we need is more knowledge on how emotional challenges can be addressed and mitigated. How challenges are experienced and processed plays an important role in the outcome, in terms of, for instance, self-awareness and learning (Byrne & Shepherd, 2015). The first sub-question is therefore:

1) *What are the particular learning challenges in action-based EE and how do students experience and cope with these challenges* (Papers I, II, III and IV).

Experiential learning theory has been prominent in understanding how entrepreneurs learn, including the four modes of learning presented by Kolb (1984); experiencing, reflecting, conceptualizing and experimenting. However, the experiential learning cycle has also been much criticized, including for not being fit for current purposes in a fast-changing and dynamic world (Ryder & Downs, 2022). Thus, this thesis aims to explore the links between the four modes of challenging experiences, reflections, transformation and action, as well as the underlying dynamics that stimulate the transition from one mode to another – while also considering the learning context (e.g. teamwork).

Furthermore, there is an ongoing debate within EE and at business schools on the proficiency level necessary to enable students to learn from emotionally demanding and challenging experiences, as well as the potentially negative effect of exposing students to experiential learning (e.g. Dean et al., 2020; Shepherd, 2019; Wright et al., 2022). What naturally follows is a discussion on how much guidance students need to turn experiences into learning (e.g. Hägg & Kurczewska, 2020a, 2019; Neck & Corbett, 2018) and how educators can best support students' emotional processing and engagement in the learning process (Clancy & Vince, 2019; Dean et al., 2020), considering that challenging experiences can both enhance and inhibit student learning (Crosina et al., 2023). Thus, through process studies, this thesis aims to examine the scaffolding that supports students in a challenging learning environment. The second sub-question therefore asks:

2) *What underlying learning dynamics and scaffolding promote student learning through challenges?* (Papers I, II, III and IV)

Following the argument that the EE literature would benefit from drawing more on educational science and related fields to understand complex learning processes (Fayolle et al., 2016), this thesis introduces the *concept of liminality* (Meyer & Land, 2006; Turner, 1969; Van Gennep, 1960) to explore experiences and understandings at the threshold of entrepreneurship, which often includes uncertainty and ambiguity. Liminality has the potential to capture the temporal, emotional, collective and transformational nature of learning. The concept has been applied to explain notions of being "in between" as entrepreneurs (Jeremiah et al., 2020) as well as specific liminal understandings in EE (e.g. Hatt, 2018). However, its aforementioned potential has not yet been applied to understand learning processes in EE in depth. Thus, the third sub-question is:

3) *How can the concept of liminality provide new perspectives on how students learn in action-based EE?* (Papers I and IV)

The four appended papers that contribute to answering these research questions are summarized in Table 1.

Table 1 Overview of research papers included in this thesis

Paper	**Research questions**	**Theoretical framing**	**Empirical data**	**Status (journals)**
Paper I: In liminality: Interdisciplinary teams learning through challenges.	How can challenges accompanied by frustration and confusion enable significant learning?	The concept of liminality (Meyer & Land, 2006).	Written team reflections from an interdisciplinary Master's course. Team level.	Presented at 3E conference 2018 Published in Higher Education, Skills and Work-Based Learning, 2020.
Paper II: From chaos to learning – how students learn from challenges in action-based entrepreneurship education.	How do students experience challenges in action-based EE? How do they cope with these challenges in their learning process?	Experiential learning theory (Kolb, 1984) and the conversational space (Baker et al., 2005).	Qualitative field data from a venture creation programme. Individual level.	Submitted to an international peer reviewed journal.
Paper III: Time matters: An exploration of how conflict processes develop in short-term and long-term entrepreneurial student teams.	How does the time frame influence team conflicts in ESTs? How does the time frame influence how ESTs manage team conflicts?	Conflict types; (Jehn, 1997) and conflict management; (Marks et al., 2001).	Two qualitative data sets from a venture creation programme. Team level.	Presented at 3E May 2021 and Academy of Management Annual Meeting in August 2023. Under review by the journal of Education and Training.

Paper IV: Transformation in the liminal space 'in between' student and entrepreneur	How do students cope and learn from being in the liminal space 'in between' student and entrepreneur? What role do peers play in the students' liminal process?	The concept of liminality and the notion of being 'in between' (Turner, 1969; Van Gennep, 1960).	Qualitative field data from a venture creation programme. Individual level.	Presented at the RENT conference in 2021 and 3E in 2023. Published in International Journal of Management Education.

The phenomenon of challenges is explored in depth in this thesis: from different theoretical perspectives (experiential learning and liminality), various levels of exploration (such as experiences and characteristics of the whole learning environment) and two levels of analysis (individual and team). Whereas Papers I, II and III focus on different challenging experiences (or events) and how the students or student teams cope with them, Paper IV introduces liminality as a way to explore the challenging learning process of an action-based programme. RQ 1 on challenges as a phenomenon in action-based EE is primarily answered through Papers II, III and IV. All four papers contribute to answering RQ 2 on the underlying dynamics and scaffolding in student learning processes. Finally, Paper I (pilot study) and Paper IV answer RQ 3 concerning liminality.

1.2 Contributions

This thesis aims to advance our understanding of how students learn in action-based EE. Through four papers applying process data and taking a student perspective, the findings suggest that action-based learning, including students working with real-world problems in teams and facing uncertainty and ambiguity, facilitates student learning, sometimes of a transformative character. Through empirical examples, including student narratives, the thesis reveals important underlying dynamics and structures that enable such deep learning. This will be illustrated in chapter 5.2 by a model that builds on experiential learning theory and includes essential factors found in the inductive studies in this thesis, that are lacking in Kolb's (1984) experiential learning cycle. In addition, the thesis indicates that learning *through* entrepreneurship should be seen as a liminal process and that the integral characteristics of liminality can provide a conceptual scaffolding for student learning where uncertainty and ambiguity are highly present.

1.3 Outline of this Thesis

The rest of the thesis is organized as follows. The next chapter, "Research Context and Theoretical Lenses", introduces the context of entrepreneurship education and the specific challenges inherent in action-based EE. Thereafter, experiential learning theory and the concept of liminality are examined as the theoretical background of this research. Chapter 3 presents the methodological considerations and approaches including my preunderstanding of the research topic. Next, Chapter 4 comprises summaries of the four appended papers included in this thesis, while their findings and the main theoretical and practical implications are discussed in Chapter 5. Finally, Chapter 6 concludes by presenting implications for theory, practice and further research.

2.0 Research Context and Theoretical Lenses

2.1 Context: Entrepreneurship Education

The number of EE courses and programmes has grown all over the world (Fayolle et al., 2016), currently amounting to more than 5,000 courses, in addition to venture creation programmes, centres and co-curricular activities, all aiming to promote entrepreneurship (Gabrielsson et al., 2023). The main argument for promoting EE from the perspective of policymakers has been to develop *entrepreneurs* and support the creation of new jobs, businesses and economic growth. The first courses and programmes thus took place at business schools (Landström, 2020). Although not contradictory, the argument for entrepreneurship training has developed and become broader, aiming to make people more "opportunity-focused" (QAA, 2012). This view emphasizes the need for graduates with an "entrepreneurial mindset", which enables them to act entrepreneurially in an uncertain and changing world and is transferable to all types of organizations and careers (Colombelli et al., 2022; Sánchez, 2011).

In general, EE programmes in the United States aim to create entrepreneurs by focusing on start-ups and business creation (cf. Katz, 2003), whereas EE programmes in Europe, especially in the United Kingdom, have a broader perspective on enterprising. This includes the acquisition and development of personal skills, abilities and attributes that can be used in various contexts and throughout the life course (Jones & Iredale, 2010). A value creation perspective (Bruyat & Julien, 2001; Lackéus, 2020) is further proposed as an alternative to the narrower goal of business creation. Value creation includes economic value but also social, cultural, ecological and emotional value (Hindle, 2010). As a consequence of a broader perspective on entrepreneurship, EE courses have a wider relevance and are now infused in all educational levels and in a broad range of disciplines, for instance, in engineering (Da Silva et al., 2015), nursing (Neergård, 2021), music and art (Toscher, 2019).

EE can take various forms depending on the goals (Fayolle & Gailly, 2008). Therefore, EE is often categorized as educating on the subject of entrepreneurship (*about*), educating to become an entrepreneur (*for*), or educating by engaging in entrepreneurship (*through*) (Blenker et al., 2011; Hannon, 2005; Pittaway & Edwards, 2012). For many years educating *about* entrepreneurship has been the most common

mode (Pittaway & Edwards, 2012) and is described as a theoretical approach aiming to develop content knowledge. Hence, it is based on behaviouristic learning theories and follows a positivistic paradigm (Kakouris & Liargovas, 2021; Lackéus, 2015). On the other hand, the modes of educating *for* and *through* take a constructivist approach to learning, where the learner is an actor, whose interest guides the process (Kyrö, 2015). While the *for*-mode is occupationally oriented and aimed at developing skills, the learning *through* is process-based and experiential, where students go through an actual entrepreneurial process (Kakouris & Liargovas, 2021; Lackéus, 2015).

Educating *for* and *through* entrepreneurship increased in the 1990s (Hägg & Gabrielsson, 2020) and represent one of the most progressive and innovative forms of teaching in higher education in terms of educational design (Neck and Corbett, 2018). These modes are based on constructivism (Kyrö, 2015), experiential learning principles (Kolb, 1984) and emphasize activities that allow the students to develop practical knowledge and skills (Neck et al., 2014). Examples of such activities are writing business plans, doing simulations, developing products, services and business models, as well as starting up real live ventures (Duval-Couetil, 2013; Fox et al., 2018; Rasmussen & Sørheim, 2006). According to Kakouris and Liargovas (2021), learning *through* entrepreneurship is, however, the only mode that truly develops attitudes and has the potential to be transformational for students. This is supported by Robinson et al. (2021), who argue that teaching *through* entrepreneurship can facilitate learning processes where students view their competencies in a new light.

This thesis enters the discussion on EE at a point in time where EE is regarded as a distinct teaching domain and a research field in its own right, distinct from the field of entrepreneurship (Gabrielsson et al., 2023). Research on EE has increased significantly (Durán-Sánchez et al., 2019) as a consequence of the growth in the number of EE courses and programmes. Gabrielsson et al. (2020) identify three core conversations over time in EE research, namely 1) "for what" discussions related to the impact, effect and effectiveness of EE training, 2) discussions concerning "why", i.e. the role of entrepreneurial education in society and the need for making students and society more enterprising and 3) research exploring "how", referring to entrepreneurial learning in and around the classroom.

The majority of research studies have been concerned with conversation 1) above, measuring the effectiveness and impact of EE, particularly in terms of psychological variables such as entrepreneurial intentions (Nabi et al., 2017) and entrepreneurial self-efficacy (Newman et al., 2019). Effect studies have found that action-based pedagogies and other experiential and learning-by-doing orientated approaches have the strongest effects on student learning (Barr et al., 2009; Gielnik et al., 2015; Nabi et al., 2017). A recent overview by Bohlayer and Gielnik (2023) found that with a few exceptions, action-oriented EE provides positive effects on all short-term and almost all long-term outcomes. However, studies exploring what works and what does not are scarce (with notable exceptions such as Bohlayer and Gielnik (2023) and Fretschner and Lampe (2019)). To deepen our knowledge of student learning, there is a need to go beyond effect studies and conduct *process studies*.

Thus, this thesis aims to contribute to the third conversation identified by Gabrielsson et al. (2020), namely the *entrepreneurial learning process* stemming from action-based learning, by exploring student learning processes. This is timely research, as Gabrielsson et al. (2020, p. 20) note that there is a "golden opportunity for entrepreneurial education scholars to intensify research efforts on what is actually going on in classrooms".

This thesis explores students' learning in terms of the process of becoming entrepreneurial and will not discuss the entrepreneurial process as such (i.e. creating an entrepreneurial opportunity and turning this opportunity into new value). However, these processes are naturally connected as the students are required to engage in an entrepreneurial process to become entrepreneurial (Dimov, 2020).

2.2 Action-Based Learning

Action-based EE represents the learning *through* mode and provides realistic experiences where students go through an actual entrepreneurial learning process (Gielnik et al., 2015; Hägg & Gabrielsson, 2020; Kyrö, 2005). The goal of the training is to expose students to the messy, complex nature of entrepreneurship that creates uncertainty and ambiguity (Chang & Rieple, 2013). Action-based pedagogies share certain similarities (Mandel & Noyes, 2016; Rasmussen & Sørheim, 2006) that

naturally create learning challenges for students. The key features of action-based EE that create such challenges are:

- Real-world problems
- Student-centred learning
- Teamwork
- Uncertainty, ambiguity and complexity

2.2.1 Real-World Problems

Letting the students work on real-world problems, including collaborating with external resources, places them in a realistic and authentic setting of acting as entrepreneurs. Interaction with the world outside the university can take several forms, for instance by providing students with an initial network of entrepreneurs and the skills to develop their own network (Lockett et al., 2017) and more directly by an expectation that students develop their own business (Lackéus & Middleton, 2011; Rasmussen & Sørheim, 2006). Kassean et al. (2015) argue that real-world problems, action and reflection provide authentic learning experiences, which lead to greater entrepreneurial abilities and propensity. Real-world problems provide the opportunity for students to create real-life value for external stakeholders that can boost motivation and deep learning (Lackéus, 2014).

On the other hand, the authenticity and complexity of real-world problems can be highly challenging for students. Barrett (1998, p.606) notes that such a problem-solving process involves "exploring, continual experimenting, tinkering with possibilities without knowing where one's queries will lead or how action will unfold." Hence, the path to a solution is ambiguous, unpredictable and uncontrollable, which can create uncertainty and stress among students (Barret, 1998; Oddane, 2017). As these problems often involve external stakeholders, the students may feel that much is at stake, creating a fear of failure.

It is worth noting that real-world learning experiences can lead to variance in student learning outcomes. Haneberg and Aadland (2020), for example, point to the complexity of problems and choice of solutions when working with real-world problems. In a venture creation process, students in the same cohort encounter different challenges and choose different solutions. Thus, when encountering complex, open-ended real-world

problems, there is no such thing as one solution, which makes the educator less able to control how students approach the problem. Aadland (2019) argues that real-world problems, in combination with student-centred approaches, make the whole learning situation more open-ended and student-driven. This brings us to the next type of learning challenge, namely the new roles of the educator and students in action-based EE.

2.2.2 Student-Centred Learning.

In contrast to traditional learning approaches (e.g. learning *about* entrepreneurship), which are teacher-centred with the students as receivers of knowledge, action-based learning is *student-centred*. This implies that the students are actors and that students' actions, experiences and reflections are the essential components for learning entrepreneurship (Hägg & Kurczewska, 2016). The educator no longer has the role of lecturer but instead becomes a coach or facilitator (Neck & Corbett, 2018). Another implication for the educator is that he or she/he must move from offering standard classes towards more individualised learning, enabling students to pursue the opportunities most personally relevant (Fayolle et al., 2016; Thrane et al., 2016). For many students, taking on the new role as an actor who is expected to "solve" complex and open-ended real-world problems is challenging, as they are more used to being a receiver of knowledge.

Therefore, there is a discussion among EE scholars on what level of guidance educators should provide and how much responsibility students can manage. Robinson et al. (2016) argue that to promote entrepreneurial awareness and mindset, the teaching must be centred on the learners and their previous and here-and-now experiences and reflections. The authors emphasize student ownership of their learning process and suggest that students and teachers *co-create* learning in classrooms, implying not a complete move to student-centred. On the other hand, Neck and Corbett (2018) propose that EE should progress further in that the students become self-directed. This implies that the learner is, to a high degree, responsible for her/his own learning process. In such scenarios the students completely control their learning and are truly doing entrepreneurship. This change is problematized by Hägg and Kurczewska (2020a), who address the need for guidance for novice entrepreneurs, stating that learners' proficiency level must be considered. They base their arguments on Kirschner et al. (2006), who

posit that there is little evidence that unguided and experientially-based approaches foster learning.

A key concept in these discussions is *scaffolding,* which describes different types of support that make the learning more tractable by bringing complex and challenging tasks within the student's zone of development (Vygotsky, 1978) Scaffolding strategies should be adapted to the current level of the student's performance and can be gradually removed as the student becomes more competent (van de Pol et al., 2010). The literature on scaffolding often differentiates between the focus of scaffolding; *what* is scaffolded (e.g. frustration control) and *how* it is scaffolded (e.g. modelling) (van de Pol et al., 2010). The one *who* provides scaffolding is often the educator. However, co-learners who are more knowledgeable can also fill this role (Hmelo-Silver et al., 2007) and may be an unexploited resource in EE as teamwork is the basic structure for the learning activities in action-based EE (Rasmussen & Sørheim, 2006; Warhuus et al., 2017). This brings us to the next key feature of action-based EE.

2.2.3 Teamwork

There are three main reasons for employing teams in EE. First, students can learn the specific content of entrepreneurship by collaborating in teams, sharing knowledge and observing each other's approaches when solving problems. Thus, the social environment created by peers and team members scaffolds the learning process (Vygotsky, 1978) and increases student learning compared to individual work (Johnson & Johnson, 2014).

Second, teamwork ability has become an essential skill in the 21st century employment market (Riebe et al., 2016). It can be argued that general team competencies are even more important in entrepreneurial teams, which must build the organization from scratch and manage different roles, knowledge areas and responsibilities, often working with complex problems, handling uncertainty and working under time constraints. All of which puts the team under extra pressure. Working in teams provides a learning arena to practice communication skills, negotiation and conflict management and understanding and meeting the needs of others (Johnsen et al., 2023). Therefore, students develop important team competencies if teamwork is provided as part of their education.

Third, teamwork reflects the real life of entrepreneurs, as most ventures are created by teams (Lazar et al., 2020). That implies that entrepreneurial activities such as opportunity recognition, opportunity development (Sarasvathy, 2001), resource mobilization, stakeholder interactions and network building are performed as a team effort. The opportunity to practice teamwork in an entrepreneurial process and what it requires to coordinate roles and tasks can offer important learning for future venture development. Overall, Steira (2022) suggests that teams can be key drivers for student learning in action-based EE because the students' learning is heavily influenced by the actions and interactions of the team to which they belong.

Despite all the potential benefits of learning by engaging in teamwork, students point to collaboration with peers as a demanding feature of EE, which gives rise to an emotional upheaval (e.g. Arpiainen et al., 2013; González-López et al., 2019; Lackéus, 2014). One reason may be that the students work on unfamiliar activities where group dynamics are crucial but uncontrollable (Mumford, 1996). Team conflict is found to be a difficult issue for EE students to deal with (Butler & Williams-Middleton, 2014). Conflicts can lead to negative consequences such as decreased learning, motivation, satisfaction and performance in student teams (Butler & Williams-Middleton, 2014; Näykki et al., 2014). On the other hand, conflicts in EE training are an opportunity to practice conflict management that enables the potential positive effects of diversity and disagreements in terms of learning, creativity and innovation to be achieved (Chen et al., 2017).

2.2.4 Uncertainty

Uncertainty is inherent in entrepreneurial action and is therefore the fourth feature of action-based EE. It has been a core element since the very first definition of the entrepreneur as "someone who exercises business judgment in the face of uncertainty" (Cantillon, 1755, quoted in Hebert & Link 1988, p.21). Entrepreneurial uncertainty can be explained by how entrepreneurs deal with the novelty intrinsic in new products, services and ventures. Whether the entrepreneur's actions in this terrain will lead to success lies in the future. The entrepreneur must, therefore, be willing to bear uncertainty (Schumpeter, 1934). Building on Milliken's (1987) conceptualization of uncertainty in three states, McMullen and Shepherd (2006) suggest that entrepreneurial uncertainty can be simplified into three questions: (1) What is

happening out there? (state uncertainty), (2) How will it impact me? (effect uncertainty) and (3) What am I going to do about it? (response uncertainty). They argue that the core interest is how uncertainty influences action, in which a normal response is that uncertainty produces hesitancy by interrupting routine action (Dewey, 1933) or even blocking action (Lipshitz & Strauss, 1997).

In action-based EE, the students are exposed to uncertainty related to the entrepreneurial process but also through the educational design, including complex and messy real-world problems, new expectations and challenging team dynamics. While these features are also found in other pedagogies in higher education, the explicit aim of exposing students to uncertainty is unique to EE. This is because uncertainty, as explained above, constitutes a conceptual cornerstone of most theories of the entrepreneur (McMullen & Shepherd, 2006). Exposing students to uncertainty in different ways to develop an ability to cope with uncertainty and ambiguity is, therefore, a fundamental part of action-based EE. This ability is also a central argument for developing entrepreneurial competencies for all as a prerequisite for dealing with an increasingly globalized, fast-paced and uncertain world (Gibb, 2002; Jones & Iredale, 2010). EE is, in this case, a means to prepare students for uncertainty.

Students can be exposed to uncertainty in the learning situation in several ways, by simulating entrepreneurial learning and presenting students with complex and messy problems, (Pittaway & Cope, 2007b), unfamiliar activities, projects and group dynamics (Cope, 2003), or challenging entrepreneurial tasks (Lynch et al., 2021). In a study of the 25 top-ranked undergraduate EE programmes in the United States, Mandel and Noyes (2016) found a common aim to push students far outside of their comfort zones to cultivate and test an entrepreneurial mindset and entrepreneurial abilities. Coping with uncertainty and ambiguity is related to taking action in that the students need experience of making decisions and acting even when the situation is not ideal or even favourable – and through such experiences, understand that "the process of taking action is likely to lead to new situations, learnings and, ultimately, opportunities" as noted by Hatt and Jarman (2021).

Arpiainen and Kurczewska (2017) argue that EE research lacks a clear understanding of uncertainty in terms of learning. Their study found that students' perceptions of

uncertainty and risk-taking changed from being a threat to becoming an opportunity and, thus, that coping with uncertainty can be learned. At the same time, the results show that there are clearly conative and affective elements in experiencing uncertainty in addition to cognitive. For instance, challenging learning situations were found to make the learners have "more doubts, show more hesitation, or feel blocked" (Arpiainen & Kurczewska, 2017, p.151). Overall, the majority of EE studies point to the importance of exposing students to uncertainty and offer examples of how this can be done. However, few studies (with notable exceptions such as Arpiainen & Kurczewska (2017)) explore *how* students learn to cope with uncertainty. This thesis aims to do so by introducing the concept of liminality, which conceptualizes the students' position as in between what has been and what is going to be. This implies an uncertain state of being where much is unknown. Liminality will be further elaborated in the next section as a perspective to understand how students become entrepreneurial

2.3 Entrepreneurial Learning Process

2.3.1 Learning from Experience

> "Experiential learning exists when a personally responsible participant(s) cognitively, affectively, and behaviourally processes knowledge, skills, and/or attitudes in a learning situation characterized by a high level of active involvement".
>
> (Hoover and Whitehead, 1975, p.25).

This thesis explores student learning in action-based EE and hence does not ask *what* students in EE should or do learn or *why,* but rather *when* and *how* learning takes place. These learning processes are examined through the lenses of experiential learning and the concept of liminality, which I will elaborate on in this subsection. For entrepreneurs, learning from experience is foundational (Cope, 2005). *Experiential learning theory* (Kolb, 1984) is, therefore, a highly influential model within entrepreneurial learning (Politis, 2005a; Wang & Chugh, 2014). Central are the experiences, often labelled "critical incidents" (Cope & Watts, 2000) and described as "highly emotional" (Lackéus & Williams-Middleton, 2011). As defined by Hoover and Whitehead (1975) above, experiential learning implies that the learner is highly actively involved cognitively, affectively and behaviourally. Such experiences can put students in a *liminal space*.

Moreover, this learning process also depends on the *social dynamics* between the student and the social environment where the learning is situated (Vygotsky, 1978). In the following, I will elaborate on the above-mentioned dimensions, aiming to highlight where existing theory has useful concepts for exploring the research questions of this thesis and what might be missing to provide a better understanding of student learning in the EE context.

It is widely acknowledged that entrepreneurs are action-oriented and that learning occurs through experience and discovery (Kuratko, 2005; Rae & Carswell, 2000), including experiment, problem-solving and failure (Gibb, 1997; Politis, 2005b). Accordingly, experiential learning theory has been prominent in understanding entrepreneurs' learning (Hägg, 2017). Experiential learning theory is defined as "the process whereby knowledge is created through the transformation of experience. Knowledge results from the combination of grasping and transforming experience" (Kolb, 1984, p.41). In developing his theory Kolb was inspired by theories from John Dewey, Kurt Lewin and Jean Piaget. The experiential learning cycle describes the process of learning through four stages: concrete experience (doing or having an experience), reflective observation (reflecting on the experience), abstract conceptualization (learning from the experience) and active experimentation (trying out what is learned) (Kolb, 1984). The learning cycle guides the development of experiential learning activities applied in action-based EE.

According to Kolb, experiential learning theory is based on the following assumptions: (1) learning is regarded as a process and not an outcome, (2) learning is derived from personal experiences, (3) learning requires the individual to resolve dialectically opposing demands that emphasize judgment in the learning process, (4) learning is integrative and holistic, (5) learning demands an interplay between the learner and the environment, and (6) learning is a process that should lead to knowledge creation, influenced by the framing and perception of the situation because learners continually depart from different levels of knowledge and understanding (Kolb, 1984, pp. 25-38).

Although these assumptions emphasize holistic, processual and contextual aspects of learning, Kolb's (1984) experiential learning cycle has been criticized for overlooking social, historical, cultural and emotional aspects of learning (Holman et al., 1997;

Jarvis, 2006) and for disregarding links between the four modes (Miettinen, 2000). Some argue that the sequential, stepwise model makes it more relevant to consider experiential learning theory as an ideology of learning than a philosophy or theory of learning (Seaman, 2008). Others question the relationship between each individual cycle and each new lived experience and how one cycle feeds into another (Ryder & Downs, 2022).

Despite the critique of experiential learning theory, the four modes of experiencing, reflecting, conceptualizing and experimenting can be useful for exploring learning in an action-based context. I will now examine in more detail the potential meanings and application of two modes central to entrepreneurial learning, namely experiences and reflection. I emphasize emotions when presenting experiences, as this has been highlighted as an important link to reflection (e.g. Byrne & Shepherd, 2015).

Emotional experiences. "Learning by doing" is central to entrepreneurs and sometimes their actions lead to "critical incidents" (Cope & Watts, 2000) - experiences that can potentially result in higher-order learning. Dewey (1938, p.25) notes that "(….) not all experiences are genuinely or equally educative" and in this respect, entrepreneurs learn from experiences that trigger an emotional upheaval and thus stimulate a need to reflect upon the trigger event. Based on this line of argument, there is a distinct stream of research exploring "failures" as a source of learning (Lattacher & Wdowiak, 2020; Politis & Gabrielsson, 2009; Shepherd, 2004). More recently, Funken et al. (2020) labelled challenging experiences as "problems", defined as unwelcome deviations and interruptions that require emotional and cognitive handling. They suggest that problems promote learning by disrupting automatic ways of acting and providing information that something needs adjustment, which subsequently triggers alternative actions.

In the context of EE, Politis and Gabrielsson (2009) suggest facilitating learning situations that present "radical breaks" or "critical learning experiences", while Robinson et al. (2016) propose that action-based pedagogies allow for learning from "highly emotional critical incidents" in the venture creation process. A common feature of this range of labels is that emotional experiences, which stand out from the everyday hurdles, are essential in entrepreneurship training. "Learning challenges", which is the label applied in this thesis, allows exploration of both single experiences and the whole

learning process. It adds to this stream of research by exploring how students cope and learn from the various emotional experiences they encounter in an action-based environment.

Emotions have been emphasized in the literature exploring how entrepreneurs learn (Gibb, 2002; Kyrö, 2008; Rae, 2005) and is proposed as an essential element for learning in EE (Lackéus, 2014; Shepherd, 2004). Both positive and negative experiences are associated with learning (Pittaway & Cope, 2007a), which underlines the importance of emotional engagement in the learning process. However, it is often experiences that have troublesome emotional dimensions (i.e. negative experiences) that are most essential for entrepreneurs' learning (Cardon et al., 2012; Shepherd, 2004). To further complicate matters, negative emotional experiences can both enhance and hamper learning. On the one hand, over time they can accelerate self-awareness and development (Cope & Watts, 2000) and motivate alternative actions (Funken et al., 2020). On the other, they can have a negative impact on well-being (Cope, 2011), cognitive capacity (Shepherd et al., 2009) and entrepreneurial intention (Bandera et al., 2020), resulting in a decrease in learning behaviour.

Because negative emotional experiences can have both negative and positive effects, scholars and practitioners are interested in how challenging learning contexts can be facilitated to enhance learning. For example, Hibbert et al. (2021) suggest reflexive practice (i.e. self-change in response to contextual challenges) through dialoguing with others who have different vocabularies and experiences. However, this requires the legitimization of emotions and a supportive environment. These points are supported by Shepherd (2004), who suggests that educators should focus more on how the students feel than on how or what they think.

Reflection. Reflection is essential for turning emotional experiences into deeper learning (Dewey, 1916) and the importance of reflection is acknowledged by EE scholars (Hägg & Kurczewska, 2016; Kassean et al., 2015; Neck & Greene, 2011). However, the EE literature focuses extensively on the *primary experience* (Dewey, 1916), the physical side of experience that relates to entrepreneurial action (Gielnik et al., 2015). According to Dewey (1958, p.5), it is not until learners engage in *secondary experiences* that they recapture primary experiences and "grasp them with

understanding". The learning process is generated by working with it, thinking about it and evaluating it, where knowledge can be developed in the final stage. Hägg (2017) argues that if entrepreneurship training places too much emphasis on developing action-oriented student entrepreneurs, it might teach them the skills to act, but most likely not provide them with an understanding of when and why the knowledge should be used. They must be able to digest their actions through reflection to turn them into learning experiences and thus avoiding a blind trial and error problem solving process (Hägg & Kurczewska, 2020a, 2020b, 2016).

Reflection needs to be taught, it is not something that all students automatically engage in (Wedelin & Adawi, 2014). One structure for reflection is provided by (Brookfield, 1987). His model of critical thinking includes five phases. First comes a trigger event, "some unexpected happening that prompts a sense of inner discomfort and perplexity" (Brookfield, 1987, p. 25), which aligns with the learning challenges explored in this thesis. The next stage is appraisal, which includes self-examination of the situation and finding others who may have experienced a similar problem. In contrast to Kolb's experiential cycle, reflection includes interaction with others. Then follows the phase of examining new ways of explaining or accommodating the experience, before the fourth phase, where the person develops alternative perspectives by trying out new ways of thinking and behaving. Finally, these ways are integrated into how we live our lives. Although Brookfield's (1987) model adds some of the aspects that are missing in Kolb's (1984) work, i.e. the emotional character of the experience and the role of co-learners in reflection, this model shares the sequential modes of learning. I argue that this step-by-step learning process does not mirror reality, at least not the often "messy" and chaotic process of entrepreneurial learning. Therefore, I will now turn to the concept of liminality, which offers ways of containing the messiness and oscillation between states of being and understanding.

2.3.2 The Concept of Liminality

> "Liminality is a form of holding the tension between one space and another. It is in these transitional moments of our lives that authentic transformation can happen".
>
> (Rohr, 2020)

In this thesis, I argue that the inherent challenges of action-based learning push students into *liminality*. Liminality comes from the Latin word limen, meaning threshold, and describes the space between "what was" and "what will come". These are moments of uncertainty but also ripe with possibility (Jeremiah et al., 2020). Liminality can be described in physical terms, such as doorways, tunnels, bridges or waiting rooms, and in emotional terms, by describing graduations, illness, divorce, moving or even death. It also has a metaphorical meaning describing the space between two events, for instance, decisions or two understandings (Thomassen, 2009).

Liminality originates from social anthropology, where Arnold van Gennep first applied the term to describe rites of passage in different cultures. These rites of passage consisted of three phases: first, a separation from one's existing environment, routines and status, then a liminal phase or transition where learning emerges and finally, an incorporation phase into a new status and role in society (Van Gennep, 1960). Later, Victor Turner adopted the concept and extended the usage by describing liminality as the space "in betwixt and between" (Turner, 1967). This notion has been applied in the organizational literature to explore "in between" spaces of work roles, organizations and career paths (Ibarra & Obodaru, 2016). Entrepreneurship scholars also found this understanding useful to better understand uncertainty and ambiguity in choosing an entrepreneurial career (e.g. Hayter et al., 2021; Kelly & McAdam, 2022a). In the field of education, liminality has achieved popularity as part of the literature on *threshold concepts* (Meyer & Land, 2003). Threshold concepts are aspects of the curriculum where students typically get stuck and can be considered as "akin to a portal, opening up new and previously inaccessible ways of thinking about something" (Meyer & Land, 2003, p.1). Liminality is in this literature applied to more fully understand the troublesome experience or 'stuckness' that the learner likely encounters when grasping a threshold concept.

The liminality literature underlines the paradoxes of liminality, as this open space where anything can happen typically feels uncomfortable, even triggering anxiety, and simultaneously provides opportunities for new ways of thinking and acting, and thus creativity, hope and transformation. Borg and Söderlund (2015a; 2015b) build on the paradoxical nature of liminality in their conceptualization of "liminality competence",

describing how individuals can take advantage of this paradoxical nature of being "in between".

Liminality not only emphasizes the process of learning; the liminal space *is* the process of learning and change. It is in between what no longer is, and what can be (Turner, 1967). What the concept emphasizes is the "fuzziness" of learning and the space and time it takes for profound change and transformations to occur. In this perspective, deep learning is not achieved through a 1-2-3 stepwise recipe, but instead through engaging in the uncomfortable space of not knowing. Jeremiah et al. (2020, p.7) suggest how this challenge can best be met:

> "The shock resulting from the uncertainty of the liminal space is best approached by espousing a mindset that is open to continuous exposure to new and potentially uncomfortable situations, and to being proactive in considering creative and collaborative avenues to help one navigate through the unknown".

This seems like an ideal approach, but it is certainly demanding, especially for novice entrepreneurs. Through two of the appended papers and this cover thesis, I aim to explore how students deal with being "thrown into" the liminal space. In this exploration, the role of co-learners is emphasized and examined. In liminality, the social dimension is originally described through the notion of *communitas*, which provides essential support for the individual undergoing the liminal transition (Turner, 1969). However, in the liminality literature, this essential aspect is often ignored. Yet, as suggested by Jeremiah et al. (2020) (see quotation above), *collaborative avenues* are essential when navigating through the unknown.

2.4 Positioning of this Thesis

Action-based learning approaches are believed to provide positive effects on student learning (Barr et al., 2009; Gielnik et al., 2015; Günzel-Jensen et al., 2017). However, 'what works' is still an unresolved question (Fretschner & Lampe, 2019; Hägg & Gabrielsson, 2020). Section 2.2 on action-based learning illustrates the breadth of learning challenges that students encounter in this approach: working on real-world problems and collaborating with external stakeholders, new roles in a student-centred

learning environment, working in teams and coping with uncertainty. The underlying assumption of action-based EE seems to be that these real-life challenges promote learning, even transformative learning, where the students see themselves and the world around them differently. However, the literature has not yet discussed in depth how students perceive and approach these challenges when they are in the thick of it, or what mechanisms and dynamics are in play when they feel "stuck". This includes how they deal with uncertainty, how they go from a challenging experience to reflection, how they learn from co-learners and make use of the scaffolding and structures provided by educators.

Process studies, as applied in this thesis, can contribute to a better understanding of why some studies find negative effects of action-based learning approaches (e.g. Bohlayer & Gielnik, 2023) and how these can be managed. More importantly, as the positive effects of such learning are dominant (Nabi et al., 2017), process studies can help to explore the black box, or perhaps "fuzzy process" of learning through entrepreneurship, finding the underlying dynamics and structures that make it work. In this way, the present thesis can contribute to enhancing the positive effects of EE.

Moreover, considering the perspective of many scholars that entrepreneurship and learning are inherently constructivist and social processes (Bell & Bell, 2020; Rae, 2005), research is surprisingly focused on individuals. The previous sections in this chapter show that the literature on entrepreneurship, entrepreneurial learning and experiential learning tends to be overly individualistic-oriented, thus disregarding the role of co-learners. In general, there is little knowledge of the effects of groups and cooperation in the entrepreneurial context (Toutain et al., 2017), which may be due to the fact that entrepreneurship has been regarded as an individual activity.

Thus, this thesis aims to contribute by exploring several gaps in the EE literature: 1) the role of *learning challenges* in action-based EE, 2) the *process* of student entrepreneurial learning, and 3) the role of *co-learners* in a challenging learning environment. Through this effort, the thesis aims to explore some of the often hidden mechanisms and dynamics of "what is going on in classrooms" (Neck & Corbett, 2018) to provide a theoretical and empirical understanding of how learning is made possible - a topic of

interest to both researchers and practitioners in the field of EE (Gabrielsson et al., 2020).

In this thesis, I suggest that learning through entrepreneurship and its key features - real-world problems, student-centred learning, teamwork and uncertainty, ambiguity and complexity - provide learning challenges that push students into a liminal space. In contrast, traditional learning approaches, such as learning *about* entrepreneurship, do not expose students to such liminal experiences. The students in action-based EE are separated from what and how they used to learn and at the same time, they are not yet entrepreneurs[1]. However, the challenging transition process in liminality can result in students integrating a new and deeper understanding of themselves and what it means to be entrepreneurial, i.e., becoming entrepreneurial. This thesis puts the learning *process* into the foreground. The focus of the appended papers and the discussion that follows in this cover thesis will therefore be on students' experiences of learning challenges in the "in between" phase.

[1] Some students may, in a narrow sense, never become entrepreneurs and I suggest that "becoming entrepreneurial" is a more appropriate term, which also underscores the potential everlasting process of learning and development in an "entrepreneurial role".

3.0 Methodological Considerations

This chapter presents the research process and methodological considerations of the research studies included in the thesis. I also elaborate on the methods in the studies presented in the appended papers. The aim is to provide transparency about the kind of knowledge that can be attained from the appended research studies. Such transparency includes theoretical approaches but also "hidden" backgrounds regarding values, knowledge, philosophical positioning and attitude towards the research topic (Schwab, 1962/1979).

Thus, to enable transparency, I will first share my background, motivation and preunderstanding of the research topic. Next, I discuss the philosophical and theoretical stance underpinning the thesis and its implications for my research. I then provide details of the research design, data collection and analysis for each paper. Finally, I elaborate on the research quality and discuss specific dilemmas I encountered in my research process.

3.1 Background for and Motivation for the Research

The role of challenging learning experiences has interested me for a long time. The research approach in this thesis is therefore phenomenon-driven (von Krogh et al., 2012) in the sense that the inquiry process started when I observed a phenomenon: how students and student teams seemed to relate differently to various challenging events in experiential education. A phenomenon-driven approach is thus different from theory-based research, which begins with formulating a hypothesis.

My research interest arose from personal engagement in experiential learning and teaching as an assistant professor in the "Experts in Teamwork" (EiT) course at NTNU. Here, part of my work was to facilitate interdisciplinary student teams working on real-world projects. I found it interesting to observe how the student teams (and the teachers) seemed to relate very differently to experiential learning activities that exposed students on a personal level more than traditional pedagogical approaches. In addition, through my training as a facilitator and as a master student in counselling, I participated in group sessions where I learned to know peoples' life stories, including my own, which I saw in

a new light. It made me reflect on how our previous experiences shape how we learn and relate to others in new learning situations.

As an educator and facilitator in EiT, I also observed that student presentations of their results at the end of the course did not necessarily mirror their learning process. I have always been more interested in what is going on "backstage" regarding how people and teams learn than the result and what they present "frontstage". Without disregarding the value of a good result, I believe that the deeper "how" and "why" modes of learning that emerge through a challenging process can lead to learning moments that profoundly change our understanding. This view is based on my experience as a student and through the writings and anecdotes of the many students I have met in EiT. My motivation for conducting educational research on challenging learning experiences is therefore influenced by this perspective.

The perspective of learning that underpins this thesis is primarily based in the humanistic-existential tradition, which I was introduced to as a counselling student. This tradition emphasizes growth through self-actualization and that humans are relational beings, as formulated by Carl Rogers (1961, p.33): "Change appears to come about through experience in a relationship". The humanistic-existential philosophy emphasizes the freedom of choice, which in modern society often implies uncertainty. My view on the student and learner is very much inspired by Rogers, who holds that the motivation to develop exists in every individual and only awaits the proper conditions to be released and expressed (Rogers, 1961). These conditions can be created by an educator who facilitates a safe and non-judgmental environment for experimenting and expressing oneself. Rogers also emphasizes the *process* of learning, which is very much in line with the topic of this thesis:

> Life, at its best, is a flowing, changing process in which nothing is fixed. In my clients and in myself, I find that when life is richest and most rewarding, it is a flowing process. To experience this is both fascinating and a little frightening. I find I am at my best when I can let the flow of experiences carry me, in a direction which appears to be forward toward goals of which I am but dimly aware. (…..) Life is guided by a changing understanding of and interpretation of my experience. It is always in process of becoming (Rogers, 1961, p. 27).

My view on challenging learning experiences is that they are complex, relational and deal with previous experiences and future expectations and goals. Thus, I aimed to apply a research methodology that allows for this complexity, without reducing it to provide explanatory answers. The phenomenon of challenges and the research gaps related to student learning in EE, including the lack of process studies, supported a qualitative research design. The level of analysis for the thesis has, however, changed during this process. The research started out with a pilot study exploring teams being "stuck" when working with real-world challenges. During my field study in the first semester of the venture creation programme, I realized that the short duration of team collaboration provided more in-depth insights into the individual student's learning process than how the team dealt with challenges. The exception was team conflicts, which is the topic of Paper III. Thus, two of the papers are at team level and another two papers as well as the main discussions in this cover thesis, are related to student learning as they participate in collaboration and co-learning with their peers. The overall objective of the research - to further increase the quality of action-based learning in EE, has prevailed throughout the process.

3.2 Philosophical Position

Crotty (1998, p.17) proposes that "at every point in our research – in our observing, our interpreting, our reporting, and everything else we do as researchers – we inject a host of assumptions". Below, I aim to unpack my assumptions on human knowledge and realities in our human world, which are embedded in the ontology, epistemology, theoretical perspective, methodology and choice of research methods.

Ontology deals with the assumptions about the nature and relations of being. In this context, it describes what we, as researchers, believe can be found as truths in the (social) world. In constructionism, where I position this thesis, knowledge can be found in what can be grasped by the consciousness or in what can be experienced (Sohlberg & Sohlberg, 2019, p. 87).

Epistemology is the theory of knowledge embedded in the theoretical perspective and, thereby, the methodology. Epistemology is a way of understanding and explaining "how

we know what we know" (Crotty, 1998, p. 8). In this study, learning is viewed as a complex, processual, situated and constructed phenomenon, which aligns with a constructionist view of knowledge. Constructionism holds that "all knowledge, and therefore all meaningful reality as such, is contingent upon human practices, being constructed in and out of the interaction between human beings and their world, and developed and transmitted within an essential social context" (Crotty, 1998, p. 42). Thus, truth, or meaning, is not discovered (as in objectivism) or created (as in subjectivism) but *constructed* in and out of our engagement with the realities in our world. An essential implication is that it is possible to make sense of the same reality in quite different ways, which is an important point when emphasizing the various experiences and ways of coping with challenges among the students.

Furthermore, the note on "*social* context" underlines that the construction of meaning (and learning) is made in our interactions with others. This is an essential part of this thesis, as I explore learning in EE as a social rather than an individual phenomenon. The social constructivist view on learning is found in innovative and creative learning practices, where it has changed the role of the learner and the teacher. For example, the educators are supposed to "support the complex individual and collective learning process, to create resources and a context for it" (Kyrö, 2015, p.612).

The theoretical perspective is the philosophical stance informing the methodology and thus providing a context for the process and grounding its logic and criteria. In constructionism, there is no "true" interpretation, but there can surely be more useful interpretations than others (Crotty, 1998). This brings me to the theoretical perspective in my research, where I have combined a constructionist and interpretive approach and a pragmatist perspective. Pragmatism holds that when our knowledge and understanding develop, so do our actions. In the course of our action and interaction with others, we negotiate the meanings of the objects (or events) in our world (Benton & Craib, 2011). This harmonizes well with the process studies in this thesis, where I explore how student entrepreneurs learn in a collaborative setting and how they deal with hands-on, real-world problems. To be inspired by pragmatism is, however, not "far-fetched" when conducting research in the field of EE. Over time, EE has moved closer to pragmatism (Kyrö, 2015), which underlies experiential, "learning by doing" approaches (Dewey, 1910).

The pragmatist perspective becomes visible in this thesis where I explore "coping mechanisms" and "strategies" as functional explanations of how the students deal with their challenging experiences. Moreover, pragmatism, at least in Dewey's terms, holds that knowledge is constructed and real at the same time, which is probably why pragmatism has become popular among mixed-method researchers. In my case, I want to underline the implications of this ontology, in that different meanings and experiences may not be a result of different realities or constructions but rather constructions based on different interactions with the world. Lastly, I believe that a simplified notion of pragmatism on "what works" favours a critical perspective on "works for what and whom", which I will discuss at the end of this cover thesis.

3.3 Empirical Setting

In constructionism, context is the 'frame' the interpretations. This implies studying things in their *natural settings*, attempting to make sense of or interpret phenomena in terms of the meanings people bring to them. Thus, it is essential to describe the context to provide the reader with a sense of the natural setting of the people being studied. Below, I present EiT, the research context in Paper I, and the NTNU School of Entrepreneurship, representing the research site in Papers II, III and IV.

3.3.1 Teams Working with Real-World Problems: Experts in Teamwork (EiT)

The first study in this thesis explores the liminal process when teams get stuck in the context of EiT. EiT is an interdisciplinary course at Master level where students develop teamwork skills by reflecting on and learning from collaboration when carrying out a real-world project. EiT is a mandatory course at NTNU with approximately 3,000 students each year, assigned to around 100 classes (Sjølie et al., 2022). The data in Paper I come from one of these classes. The student teams worked in collaboration with external actors, where the focus was on coming up with ideas for sustainable solutions that could be implemented in the local municipality. EiT follows the principles of experiential learning. Reflection is central to learning activities, assessment and grading. The basis for reflection is the situations that arise as the team works on their chosen project. It is up to the student teams to distribute team roles and tasks and to decide on how to solve the problem (Sjølie et al., 2022).

3.3.2 Venture Creation Programme: NTNU School of Entrepreneurship (NSE)

Papers II, III and IV in this thesis are concerned with venture creation programmes as examples of action-based EE (Rasmussen & Sørheim, 2006). NSE is a two-year Master of Science programme in entrepreneurship that combines an academic master degree with venture creation. NSE's slogan, "Not because it's easy", mirrors a learning environment that aims to challenge the students by providing experiences outside their comfort zone (NTNU Studies NSE). Moreover, the programme has a long tradition of applying teamwork as a core structure in the learning process (Rasmussen & Sørheim, 2006).

NSE's vision is to educate "the best business developers in the world," and its main focus is on technology-based venture creation[2]. The student venture is regarded as a vehicle for learning and not directly included in assessments or grades. However, a majority of the academic courses are related to students' venturing activities (Haneberg, 2020). Through its 20 years of existence NSE has become well-known nationwide, and each year several hundred students apply to enter the programme. The selection of students is based on academic transcripts, a written application and an interview that focuses on the student's motivation. The goal is to create a group of students from different disciplines, with various competencies and work experiences, who are highly motivated to become entrepreneurs/business developers. The cohort in my dataset consisted of 36 students, 21 men and 15 women, with backgrounds in technology, engineering, mathematics, sociology, pedagogy, drama, innovation studies, nursing and physiotherapy. Some students had entrepreneurial experience before they enrolled in the programme, but the majority had not previously engaged in entrepreneurial activities.

The main part of the data were collected from the first semester of the VCP, where the students conducted five feasibility studies as the main activity. Here, the students explore the potential of business ideas initiated either by themselves, researchers at the university or external actors. The student teams have only five days to collect information, analyse and consider its relevance, write a report and prepare a presentation, which puts the students and the teams under a great deal of pressure. The

[2] https://www.ntnu.edu/studies/mientre

feasibility studies expose the students to uncertainty, ambiguity and complexity. The goal is to provide an authentic learning arena where the students can try and fail several times, and learn through reflection and guidance. Educators, student assistants and mentors, in addition to alumni students and students from the previous cohort, are available in different ways to facilitate current students' learning. The structure for the following three semesters is that the students form teams and develop their own venture - often based on one of the ideas from the feasibility studies. This activity is combined with academic courses and writing a master thesis.

3.4 Research Design

The methodology is the foundation for the strategy behind the choice and use of particular methods, linking the choice of methods to the desired outcomes (Crotty, 1998), thus informing the research design. The research design clearly focuses on the research question and the purpose of the study. It describes how the researcher moves from the theoretical perspective to the empirical world (Denzin & Lincoln, 1998). This thesis consists of one pilot study from the EiT context, presented in Paper I, and one exploratory study on VCPs, resulting in Papers II, III and IV. Table 2 provides an overview of research questions and level of analysis in the four appended papers.

Table 2 Overview of research questions and level of analysis in the appended papers

Paper	**Research questions**	**Level of Analysis**
1	How can challenges, accompanied by frustration and confusion enable significant learning?	Team level 2 student teams
2	1) How do students experience challenges in action-based EE? 2) How do they cope with these challenges in their learning process?	Individual level 36 students
3	1) How does the time frame influence team conflicts in ESTs? 2) How does the time frame influence how ESTs manage team conflicts?	Team level 10 student teams
4	How do students cope and learn from being in the liminal space "in between" student and entrepreneur?	Individual level 4 students

As described above, the perspective on learning that underpins this thesis is that learning is a socially constructed process. This has important implications for the methodological choices in this thesis. First, this perspective implies the collection of process data, i.e. during the learning process and not (only) at the end of the course/programme. Second, the thesis is positioned in social constructionism and in a humanistic-existential tradition, which implies that I am interested in the experiences of the learners. Thus, this thesis takes the student perspective. Third, as learning and team dynamics are complex matters, several data sources will strengthen the research quality. This is discussed in more detail in section 3.7. Finally, the "how" question implies a qualitative study that aims to understand the nature of the particular phenomenon of learning challenges (Merriam & Tisdell, 2016).

3.5 Data Collection

3.5.1 Five Types of Qualitative Data

Methods describe the techniques or procedures used to gather and analyse data related to some research question or hypothesis (Crotty, 1998). Table 3 provides details of the different sources of data applied in the main study (Papers II, III and IV) and what purpose they were intended to fulfil. Furthermore, the table includes the data of my co-author in Paper III, Iselin Mauseth Steira, who has data from five new venture teams from the second to fourth semester of the VCP. This dataset was applied to explore and compare conflicts in the new venture teams (co-author's dataset) and the feasibility study teams (my dataset). Below the table, I elaborate on the observations and interviews as these methods have been particularly important for the research in this thesis.

Table 3 Overview of data material from the main study and purpose in the analysis.

FS = Feasibility studies

DESCRIPTION	AMOUNT	PURPOSE
OBSERVATION Direct, open, not-participatory		
Observation of 3 groups FS1, FS3 and FS5. Detailed notes were taken during all group meetings.	75 hours of observation. 121 pages of field notes	Gain a deep understanding of the task, the specific challenges the teams faced and their response. Information about team dynamics.
Observation of 7 plenary meetings with educators and students, where the aim was either to inform and provide structure for the task, motivate, or initiate reflection. These meetings lasted for 30-90 minutes. Notes were taken.	14 pages of field notes.	Gain a contextual understanding of the course, task and the educators' expectations.
Observation of group presentations of their FS in front of a panel and class. Notes were taken on the presentations of the 3 observed teams.	9 pages of field notes.	Observe the teams' results of the FS and the "front stage" presentation. Compare and contrast with the "backstage" discussions and reflections.
INDIVIDUAL REFLECTIONS Written, anonymously, Select Survey		
All students were asked five questions after each feasibility study: 1) Group number 2) Gender 3) What has been most challenging in this FS? 4) How did you experience this/these challenge(s)? Please describe concrete thoughts/feelings. 5) How did the group deal with the challenge(s)? Please elaborate by describing views and actions that took place in the group, and alternatively how you proceeded.	Answers varied from 5 sentences to a quarter of a page. In total 138 responses from 5 FS. (Response rate= 77%)	Learn how the whole group of students experienced challenges in each of the FS, and gain an impression of the processes in the teams that I did not observe. Compare and contrast with more detailed data.
GROUP REFLECTIONS Oral		
Oral group reflections after FS 1 (3 groups), FS 3 (1 group) and 5 (3 groups). Here the students evaluated the team process and result and gave	141 pages of transcriptions.	Gain a deep understanding of how the students evaluate their work and each other. Compare and contrast with

each other feedback. Reflections were recorded and transcribed. From 45 to 70 minutes in duration.		other data sources.
INTERVIEW 1 Semi-structured interviews[3], December 2019		
Semi-structured interviews at the end of the semester with 5 students who I had observed in FS1, FS3 and FS5. The interviews were recorded and transcribed. From 50 to 75 minutes in duration.	85 pages of transcriptions.	Gain a deeper understanding of their 1) Experience of challenging events. 2) Perception of group dynamics and own role. 3) Perception of important learning events.
REFLECTION PAPER Exam paper		
Individual written reflections (max. 4,000 words) on a chosen topic, based on own experience from the feasibility studies, reflection and relevant theory.	36 papers.	Learn more about what the students experience as significant learning events in the course.
INTERVIEW 2 Semi-structured interviews[4], April 2021		
Semi-structured interviews with the same five students as in December 2019. Digitally on Zoom. The interviews were recorded and transcribed. From 50-80 minutes in duration.	62 pages of transcriptions.	Learn about the students' experiences of challenging events after the last interview, as well as team experiences and perceptions of learning.
DATASET CO-AUTHOR Individual interviews Group interviews		
Semi-structured interviews with 16 students in 5 new venture teams. 12 group interviews. 45 individual interviews. Timespan: 16 months (From December 2017-2019).		Explore conflicts and conflict management in the new venture teams and compare with the feasibility teams (data set above).

[3] Interview guide can be found in the appendices
[4] Interview guide can be found in the appendices

Table 4 below provides an overview of the data material (specified in Table 3) that was applied in each of the four papers. It also illustrates that Papers II, III and IV are based on the same field study, but include different types of data and that new data are added in Papers III and IV.

Table 4 Overview of data material applied in each of the appended papers

Pilot case study	**Main study**		
Paper 1	**Paper 2**	**Paper 3**	**Paper 4**
Process reports from two student teams (23 and 29 pages), including reflection on challenging situations and individual and group reflections on their learning.	Primary data: Observations of 9 teams 7 team reflections 138 individual reflections 5 interviews Secondary data: 36 exam reports (i.e. individual learning reflections)	Primary data: Observations of 5 teams 5 team reflections 5 interviews + Data-set from co-author* Secondary data: 25 individual reflections	Primary data: 8 interviews (4 students in 2019 and same students in 2021) Secondary data: Observations of 9 teams 5 team reflections 4 reflection papers

*Data set from co-author Iselin Mauseth Steira is presented in Table 3.

3.5.2 Sampling Procedures

The cases in the four papers were chosen based on *purposeful sampling*, deriving from the emphasis in qualitative research on obtaining an in-depth understanding (Patton, 2015). Thus, the researcher is searching for *information-rich* cases. The selection of NSE and EiT as cases is described in section 3.3. However, in qualitative studies there are usually two levels of sampling, where the second level deals with selection within cases (Merriam & Tisdell, 2016). In the appended papers, the sampling procedures are presented in various detail; therefore, I will provide an overview here.

The two teams included in Paper I were two of five teams in a class of 27 students (25 female and 2 male) comprising students of medicine, engineering, pedagogy, pharmacy, business and finance and architecture. The two process reports were chosen because these two teams had encountered the most demanding challenges and had reflected in depth on these situations. In Paper II, the whole class was part of the study. However, to

achieve greater depth, five students were selected as key participants based on the fact that I had observed them in all three feasibility studies. First, I observed them in Feasibility Studies 1 and 3, after which I chose to observe them in Feasibility Study 5 as well to make the most of the data material before asking them to take part in an interview. The five students represented a diverse group in terms of gender, educational background, motivation and experiences. In Paper III on conflicts, we selected the five teams from my data set and five teams from co-author's data set on new venture teams where conflicts were most explicit in the data. In Paper IV, the selection criteria are explicitly explained as related to variation in liminal experience and diversity in terms of disciplinary background, gender and personality. This sampling strategy can therefore be labelled as theoretical sampling (Merriam & Tisdell, 2016), as it took place at the time when I was developing the conceptualisation on EE as a liminal process. The narratives were therefore chosen because they could, in various ways, mirror the liminal process to further develop the theory.

3.5.3 Observations

Observations have not been emphasized in the method section of the papers, yet the hours of being present in the same room as the students to gain an "insider perspective" have been of great value in the analysis process. It provided me, as an outsider, with a better understanding of the context. Observations yielded information on the physical setting, the students, their activities and conversations (Merriam & Tidsdell, 2016). Furthermore, they contributed information on subtle factors, including how the students relate to each other in terms of body language, eye contact, tone of voice, how they talked to each other and also how they were silent together. Such observations on micro-level communication enabled a deeper understanding of the different team dynamics but also a more holistic view of the students' learning situation.

I will illustrate this by means of two examples: one of observing the distance between students and one of closeness. In the first round of the feasibility studies, I observed a team where I could sense an almost hostile atmosphere when I entered the room. The team members seemed to avoid eye contact; they communicated in few sentences and there was no laughter or interaction that was not directly related to the task. As I wrote in my research diary, sitting there as an observer felt very uncomfortable. The observation was important for how I later interpreted this team's individual and group

reflections, as well as the interview with one of the team members who was greatly affected by this challenging team dynamic.

In the last feasibility study, I observed a group reflection where the team members became very close. One team member disclosed that he was filled with sadness when a feasibility study came to an end, remarking "*What can I do that this won't end?".* This lead to a conversation related to fairly existential experiences of being students in this "community", and as an observer I was deeply moved. I do not believe that a retrospective description in an interview or even a taped recording of the conversation would provide the same impression of closeness between the team members.

I took notes during all my observations, where on the left side I wrote down as much as I could of what they said to each other and on the right side, other observations (body language, tone of voice, etc.) and questions that arose while observing (Merriam & Tidsdell, 2016). This also included questions related to what does *not* happen contrary to my expectations (Patton, 2015), for instance, "why don't the students talk about the questions/feedback from the educator after she has left the room if they were that eager to discuss the issues with her?" It was essential to write down the questions that arose while observing in order to be aware of my assumptions and to enable more information in further observations that could strengthen or weaken my first impression.

Direct, open, non-participatory observations can have a negative impact in that the people being studied behave differently (i.e., in more socially acceptable ways) because they know they are being studied (Merriam & Tisdell, 2016). However, the students seemed to become accustomed to my presence in the room. The short deadline that "forced" them to focus on the task could also have made them less likely to be distracted by my presence. I emphasised from the beginning that action-based EE exposes the students to many challenges and that I was curious about their experience, but did not intend to evaluate them in any way.

3.5.4 Interviews

Although observations can inform the "what" questions regarding context and behaviour, they do not reveal the "why", i.e. the underlying reflections and motives. Or, as Patton (2015, p. 426) put it: "We cannot observe feelings and thoughts and intentions.

(…) We cannot observe how people have organized the world and the meanings they attach to what goes on in the world". Thus, semi-structured interviews, guided by a list of questions to be explored, became an important source of data (Merriam & Tisdell, 2016). The interviews were the primary source of data in Paper IV (focusing on the learning process) and one of the primary sources in Paper II (focusing on challenges) and Paper III (focusing on conflicts).

I had established contact with the interviewees after five months of observation and they were positive about participating in the interviews. Before the interview I asked the them to draw a timeline that illustrated their experiences of challenges in each of the feasibility studies. We used the timeline in the interview as the basis for our conversation. The interviewees were very willing to share their experiences and I focused primarily on being present and listening. I prioritised open questions (i.e. "how?", "what?", and "which?") in the interview guide and in the follow-up questions to enable them to share *their* experiences and reflections and prevent an evaluation of themselves, their team members or the programme as such (e.g. by avoiding asking "why?") (Merriam & Tisdell, 2016). Some questions needed elaboration, such as when I asked which team they would say a) performed best, b) where they thrived the most and c) where they learned most. I asked for examples when necessary and sometimes for clarification if I did not understand what they meant or when in my view what they said was not consistent with what they had said previously or what I had observed.

In the first interview, I shared some of my observations and asked for their thoughts. Their response provided a better understanding of their motives, thoughts and feelings in the particular situation. In the second interview, I summarized what I regarded as important statements in the first interview (16 months earlier) and asked what they thought about that issue now. Their reflections from looking back on their first semester, were relevant for my interpretation of their learning process.

The second interview was conducted virtually on Zoom because it made it easier to reach the students and because during the COVID-19 pandemic, meetings had to be arranged virtually. Virtual interviews have some obvious benefits in terms of flexibility, but some potential disadvantages such as a "filter" that may blur the conversation and contact between the interviewer and interviewee (including Wi-Fi-issues) (Oliffe et al.,

2021). However, in the present case, only one interview had some minor technical issues and the students seemed open and eager to reflect on and share their learning experiences in a virtual format. In fact, the opportunity to be interviewed while sitting at home appeared to make them even more comfortable about sharing their experiences (Oliffe et al., 2021).

3.6 Data Analysis Process

The data analysis process differed from paper to paper. As my research questions regarding how students learn *through* entrepreneurship were not addressed in depth in existing literature and theories, inductive coding was the main approach. Here I will describe the analysis process in each paper and further details can be found in the appended papers.

The aim of Paper I was to apply liminality to discuss how challenges can enable learning. The analysis started by coding the challenging experiences of two student teams as written in their process report. This included coding the responses of the team members, as well as actions and reflections at team level. This coding was mainly to identify the most significant learning situations (i.e., where the students became most stuck) to consider which ones to include in the narratives. The first draft of narratives was constructed based on these situations. Then a conceptual model of teams being stuck was developed, inspired by a model of individuals in liminality by White et al., (2016). The new model was applied to re-analyse the narratives and describe the phases from becoming stuck to getting unstuck. This process was the basis for discussing student team learning through challenges (i.e., being stuck). Although I primarily conducted the analysis, the interpretations and construction of narratives were discussed in depth with my co-author; Ela Sjølie. As this paper was further developed from a conference paper, some sections had also been discussed with those co-authors, Roger Sørheim and Marte Konstad.

Paper II was analysed by inductive coding through several cycles, where the two last phases are described in the paper. First, I read over the data material to gain a sense of "what was going on" and took notes of some preliminary thoughts. This step was repeated after each of the five feasibility tests. I then started to inductively code the

different challenges by applying in Vivo coding (Corbin & Strauss, 2015), referring to the actual language in the data material. Interviews, individual reflections and group reflections were included in this step. Observations provided a "lens" to interpret the other data material. Next, the students' experiences of challenges were coded by process coding (Saldana, 2016), (e.g. communicating in a diverse group). This resulted in 36 codes (e.g. making a presentation in front of a panel/7 examples/Example 2: *Today, I was very nervous when it was our turn to* make a presentation *and I felt I performed badly because I was so stressed* (Tine, Group reflection, FS 5)). Then, these codes were categorized as task, team or individual challenges. How the students experienced the challenges was coded by emotional coding (Saldana, 2016), focusing on the intensity of the response. These responses were rephrased as questions (e.g. "Will I be accepted by my peers?"). The most emotionally difficult challenges were presented in the paper. As a parallel process, the student experiences of the learning challenges were drawn on a timeline to see when the various challenges were most prevalent in the students' learning process and to explore differences between the three categories in terms of how the challenges were experienced and coped with at different times. Although I primarily conducted the analysis in this paper, it was discussed throughout the process with my co-authors, Roger Sørheim and Ela Sjølie.

Paper III developed from the discovery of a phenomenon, the many conflicts in student entrepreneurial teams, and how they seemed to develop differently in short-term and long-term teams. A discovery that enabled the application of my and my co-author's datasets to challenge, rethink and illustrate existing theory (Alvesson & Kärreman, 2007). The analysis process started out by coding the interviews, as well as individual and group reflections with reference to existing theory and definitions of conflicts (De Dreu and Gelfand, 2008) and conflict types (i.e., process, relationship and task conflicts) (Jehn, 1997). Although the observations were not coded, they were essential for interpreting the students' statements. In addition, we analysed conflict management approaches by the student teams' responses to conflicts, informed by conflict management theory (e.g. Marks, 2001; Rahim, 2002). When conflict management theory did not "fit" the data, we opened up to rethink how conflict management was approached in this context (Alvesson & Kärreman, 2007) and found new ways of labelling the students' responses to conflicts. Next, these data were systematized in timelines and we wrote narratives for each team describing their conflicts and how they

reacted. These narratives were used for a within-group analysis (i.e., short-term and long-term groups. We then performed the overall analysis, searching for similarities and differences between the two groups of teams. Finally, we highlighted the differences and discussed and contextualized this new knowledge in relation to previous studies. Although described here as a step-by-step procedure, in reality it involves constantly moving back and forth between data, theory and previous analysis. In this paper, both authors contributed equally to the analysis.

In Paper IV, the interviews were analysed by identifying liminal aspects of the students' learning process using the identifiers of liminality acknowledged in the literature (Muhr et al., 2019). These identifiers included confusion, uncertainty, ambiguity, frustrations, multiple identity positions, feeling out of control and identity struggle (Beech, 2011; Czarniawska & Mazza, 2003). Just as important were the identifiers with positive connotations that emerged from the open liminal space, including hope, opportunities, creativity and transformation (Borg & Söderlund, 2015). Although the interviews, conducted at two different times during the VCP, were the main source of data, the observations, the four students' reflection papers and group reflections added important information for constructing the narratives. What I considered to be the most significant liminal experiences in the students' learning journey were then presented as the students' narrative of being "in between", which according to Riessman (2008), is constructed jointly by the researcher and the research participants. Therefore, what is analysed and presented in the paper are certain parts of the student learning process, in this case aiming to illuminate student transformations *through* entrepreneurship from the liminality perspective. This paper is single-authored. However, the analysis was discussed with my supervisors.

3.7 Research Quality

Research quality deals with the question of why the readers of this thesis should believe what is being written. However, what labels to apply when assessing the research quality is much debated among quality method scholars (Merriam & Tisdell, 2015). Lincoln and & Guba (1985) argue that naturalistic quality criteria are more adequate in qualitative research than the traditional criteria in quantitative research, i.e. validity, reliability and objectivity. In my experience, reviewers may still use some of the same

criteria for both qualitative and quantitative methods, e.g. to what degree the study can be replicated. I position myself as a social constructionist and believe that the role of the researcher in qualitative research is too central for a study to be replicated. For instance, Tracy (2013, p.229) describes why replication can be problematic for this thesis, which explores learning processes:

> Because socially constructed understandings are always in progress and necessarily partial, even if the study were repeated (by the same researcher, in the same manner in the same context, and with the same participants), the context and participants would have necessarily transformed over time - through ageing, learning, or moving on.

Pratt et al. (2020, p.1) even argue that the ‘‘replication crisis’’ in experimental social psychology is “spilling over to qualitative research in unhelpful and potentially even dangerous ways”. They suggest applying criteria suitable for qualitative research, such as those presented by Lincoln and Guba (1985): credibility, dependability, confirmability and transferability. I find these criteria suitable and useful for considering the quality of this thesis and below I elaborate on each one of them.

Credibility deals with the degree to which the researcher has given voice to the different constructions of reality found in the data and is assessed by those studied, in my case the students (Pratt et al., 2020; Lincoln & Guba, 1985). First, I have applied *triangulation* (Denzin, 1978) through the use of 1) multiple methods (i.e., observations, interviews, as well as individual and group reflections), 2) multiple sources of data (i.e. process data, team and individual data and follow-up interviews), and 3) multiple researchers (i.e. two or three researchers in three of the papers and all papers discussed with supervisors), which I believe has increased the credibility of my studies. Second, persistent field observations in several rounds enabled an “insider perspective” of the students' learning environment (e.g., described in section 3.5.3 on observations). In addition, a dialogue with the field, in which students from the same context but from new cohorts showed a high degree of identification, also strengthens the credibility of the present research (Lincoln & Guba, 1985).

Dependability should not, as discussed above, be considered through quantitative replication logic, but rather by being transparent about the different steps and considerations in the research process (Lincoln & Guba, 1985). Dependability (or reliability) deals with the consistency between the research objectives, the methods applied and the findings. The aim of this chapter is to be transparent about the different steps in the research process, in terms of research design, methods and data analysis. In the various papers, I have provided examples of quotations from the students to enable the reader to evaluate the rigour of the analysis (Charmaz, 2014).

Confirmability is a characteristic of the data, not the investigator (Pratt et al., 2020) and relates to whether the findings are shaped by the research participants and not biased (Lincoln & Guba, 1985). The reflexive journal that I have written throughout the whole research process has helped me to sort out my own biases and assumptions when interacting with the research field and data material. Moreover, in all phases of the data analysis I discussed the findings and potential biases with my co-authors and supervisors.

In this regard, I want to make a brief statement about my links to the research contexts of this thesis. Experts in Teamwork (EiT) has been an important part of my working life since 2006, where I have had different roles. In 2017, I was granted leave from my position to do a PhD in Engage, of which EiT is a part. In the first study, where I was also the teacher, I regarded myself as an *insider.* In subsection 3.8 below, I will discuss my role as an educator and researcher in EiT. Before I entered the VCP context, I was relatively unfamiliar with the NTNU School of Entrepreneurship. In these studies, I would therefore regard myself as an *outsider*, although the programme is located at my home university. I had, however, visited NSE a few times through my role in EiT.

Transferability is concerned with the extent to which the findings of one study can be applied to other situations (Merriam & Tisdell, 2016) and following a pragmatist inquiry, if the findings can be useful for practitioners and academics. This thesis aims to understand the phenomenon of learning challenges in action-based EE and through such understanding, provide knowledge that can be applied in other, similar contexts. However, it was not an aim to find a general truth about learning processes for entrepreneurship students (i.e., generalizability of findings). Lincoln and Guba (1985)

suggest that sufficient descriptive data is necessary to make transferability possible. Transferability also mirrors how we can think of every study and situation as theoretically being an example of something else (Merriam & Tisdell, 2016). That is what learning is about, what we experience in one situation that can be transferred to similar situations in life.

The exploratory fieldwork over one semester provided rich process data that enable thick descriptions (Geertz, 1973), which strengthens the transferability of this research (Lincoln & Guba, 1985). For instance, in Paper IV, I chose to present the narratives of only four students. These detailed descriptions of the various learning journeys and experiences of the four students can resonate with others in different contexts and potentially enable them to apply the findings to their own (learning) situation. Furthermore, Papers II and III include rich descriptions of the context and the research participants.

The data material for this thesis was collected within the context of the same university (NTNU). This enabled collection of rich, qualitative data over one semester. However, it can also constitute a limitation in terms of transferability. Universities are organized in different ways and the students, teachers and education policies are influenced by social, cultural and economic factors that probably affect the types of challenges and how these are perceived.

3.8 Ethical Judgments

The papers in this thesis follow core ethical procedures when conducting research regarding anonymity, confidentiality and informed consent. The two studies (pilot and main study) have been approved by the Norwegian Centre for Research Data (NSD). All participants were informed about the purpose and use of data prior to the study and were allowed to withdraw at any time. All participants gave their written consent. The participants and teams have been anonymised. Here, I will focus on situations where I considered ethical aspects other than these “standard procedures” (Guillemin & Gillam, 2004).

Paper 1 is based on process reports from students in EiT, where I was an educator. Before the course started, I assumed that these students' learning experiences could be relevant to my research question and at the end of the course, I asked for their permission to use the written reflection reports (exam) for research purposes, clearly stating that their consent would have no implications for their grades. I believe the research would be more interesting if I could include my observations during the course and group interviews. However, it was an ethical decision to leave this out due to my limited knowledge of action research and the fact that simultaneously taking on the roles of researcher and educator could disturb my focus as an educator, be confusing for the students and in a worst case scenario, hamper the their learning.

Papers II, III and IV are primarily based on the data set from one semester of feasibility studies. Although all 36 students gave their consent at the beginning of the data collection, I again asked each team to confirm that they had no objections to me being present in the room while they were working and if I could take notes. I clarified that they could, at any point, say that they would prefer not to be observed. That happened on one occasion when a student said she would like to do the group reflection without being observed but that I could record the conversation. I repeated and clarified my role as a researcher when students asked for my perspectives and advice during the feasibility study.

Before each interview I repeated their rights as research participants. An essential part of ethics in research is to consider the potential consequences the research might have for the research participants (Kvale, 1996). As discussed above, I have done my best to eliminate potential negative consequences of this research, for instance, for their learning. If any, the research seemed to have positive consequences for the participants. In particular, the students interviewed expressed gratitude because the questions helped them to reflect more deeply and it felt good to talk openly about their challenging experiences.

My position as a PhD is in Engage – Centre for Engaged Education Through Entrepreneurship, and the practice, research and knowledge of my colleagues have naturally influenced my perspectives on entrepreneurship education. The centre's vision is to "increase the number of students with entrepreneurial skills and the mindset to

become change agents for the better" (Engage). The underlying assumption is that learning through entrepreneurship is the best way of achieving this goal. Thus, in my research, I have been attentive to keeping a critical eye on learning through entrepreneurship to ensure that I communicate students' experiences and meanings, - also those which are negative and critical.

4.0 Summary of Appended Research Papers

The four appended research papers in this thesis address the research questions presented in the introduction. This chapter summarises the papers and their findings will be further discussed in Chapter 5.

4.1 Paper I: In liminality: Interdisciplinary Teams Learning Through Challenges

Introduction

The first paper in this thesis introduces liminality as a theoretical concept to analyze student teams' learning through challenges. Pedagogical approaches that introduce students to real-world problems, collaboration with stakeholders and interdisciplinary teamwork expose students to uncertainty and complexity, similar to challenges employees encounter in today's working life. Thus, learning to manage such an environment is a key qualification that better prepares the students for working life. Hence, students need to experience and manage uncertainty and complexity as part of their education (Kassean et al., 2015; Penaluna & Penaluna, 2015; Trilling & Fadel, 2009). Real-world challenges that are encountered as a team add another level of complexity and little attention has been given to understanding *team processes* in challenging situations in the context of higher education (Borrego et al., 2013; Näykki et al., 2017).

However, such a learning environment presents learning challenges that often are experienced as personally and emotionally demanding, where the students do not have a script to follow. Experiencing challenges can have a negative impact, which may reduce motivation to continue learning, or a positive impact, which provides mastery experiences that are significant for learning (Kiley, 2009; Meyer & Land, 2006). In this paper, we argue that the outcome depends on how the student teams handle being in *liminality*, being "stuck" and not knowing how to continue. Thus, this study aims to apply liminality as a theoretical lens to explore and discuss how challenges, accompanied by frustrations and confusion, can enable learning.

Theoretical Background

Liminality, meaning a boundary or a threshold, is in this paper applied to address the challenging experiences when the student teams got stuck and the students felt frustrated or confused. In these situations, the students are forced to change the way they view things without knowing how to do so. Liminality has originally been used to describe rites of passage across cultures (Van Gennep, 1960) and later to explore troublesome learning as part of the threshold concept (Meyer & Land, 2003). In this paper, liminality is applied at team level, which represents a novel approach.

Method

To explore the concept of liminality, this paper presents the narratives of two interdisciplinary student teams. The students were taking part in a Master's degree course, where the main goal is to develop interdisciplinary teamwork skills by working together in teams for three weeks to identify problems and generate new ideas with external stakeholders. At the end, the student teams write a process report based on daily individual and group reflections on the experiences in the course. The four situations in the narratives are drawn from the process report. A flow model of the experience of liminal space suggested by White et al. (2016) was adapted to team level and applied to analyse four situations where the teams became stuck as well as the processes involved in becoming unstuck.

Findings

The four situations where the teams became stuck made the students feel frustrated and they did not know how to proceed. However, three of the situations followed different patterns. Three aspects are highlighted in the discussion: 1) Christine is an example of a mature student, comfortable in a liminal situation, who was able to initiate a shift in the team from focusing on the feeling of failure to the opportunity to be creative. 2) A mastery experience of "getting unstuck" strengthens team relationships and the ability to deal with new challenges. Such experiences can potentially lead to transformed understandings. 3) Superficial handling, the process of going from stuck to unstuck, can make the team dynamics follow the same pattern later, resulting in new experiences of being stuck. Furthermore, the four situations illustrate that team diversity may cause challenges for the students. However, student variations in coping with liminality can facilitate the process of becoming unstuck.

Contribution

The paper introduces liminality as a concept that can enhance understanding and learning from challenges that emerges when interdisciplinary teams work on solving real-world problems. Liminality has previously been applied at individual and organizational levels. This study offers a novel perspective by exploring liminality at team level and discussing how teams can go from being "stuck" to "unstuck". We suggest that liminality can enhance learning by 1) teachers using the concept as a tool for observing team dynamics, 2) reminding teachers of the value of challenges for learning and 3) normalizing students' feelings of frustration and confusion in challenging learning processes.

4.2 Paper II: From Chaos to Learning – How Students Learn from Challenges in Action-Based Entrepreneurship Education

Introduction

The use of authentic and team-based learning pedagogies is increasing, such as the action-based approach in EE. This approach exposes students to real-world problems, uncertainty, complexity and ambiguity (Kassean et al., 2015; Rasmussen & Sørheim, 2006). In such a context, the students must cope with various challenges, which they often find emotionally demanding (e.g. Arpiainen et al., 2013; Lackéus, 2014). The learning literature (e.g. Vygotsky, 1978) suggests that learners should be pushed outside their comfort zone, but how far can we stretch students' learning zone? There is an ongoing discussion on the potential negative consequences of experiential and action-based learning (e.g., Shepherd, 2019; Wright et al., 2022) and students' level of maturity to deal with a challenging and student-centred learning environment. However, we know little about how students actually experience the various challenges they encounter and how they deal with them. Therefore, this inductive study aims to explore 1) How students experience challenges in action-based EE and 2) How they cope with these challenges in their learning process.

Theoretical Background

Action-based EE builds on experiential learning theory (Kolb, 1984) and the value of active, personal and direct experiences. In this paper a sub concept of Kolb's theory is introduced, which emphasizes the social and contextual dimensions of learning, i.e.,

conversational learning and conversational space. The conversational space includes the physical, temporal and emotional space of talking and being together (Baker, 2010) and connects the two modes of reflection and action in that students can share and learn from their different experiences and views. The paper also elaborates on the emotional dimension of entrepreneurship that is triggered through exposure to the uncertainty, complexity and ambiguity inherent in the entrepreneurial process. This paper aims to contribute to the debate on how such a challenging learning environment can be facilitated to provide experiences that support learning in positive ways.

Method

Due to a lack of knowledge on how students cope with various challenges, especially over time, we designed an exploratory field study where real-time data from 36 students during the first semester of a VCP was collected. The data consisted of several sources: observations, individual reflections, group reflections, reflection papers and interviews. Data were further analysed through two cycles of coding, first process coding and then emotional coding (Saldaña, 2016).

Findings

The main findings of this study are that there is a difference between how students cope with task-, team- and individual challenges. Task challenges were very demanding at the beginning but became manageable fairly quickly as the students gained more experience in approaching the task. On the other hand, team- and in particular individual challenges were experienced as more emotionally intense as they touched upon earlier negative experiences as well as deeper and more personal issues, and these challenges took more time to overcome.

Furthermore, we found that the individual issues were often hidden, i.e. they were not part of the conversations among the students or between the students and teachers. In contrast, task issues were normalized by the faculty and were part of the everyday conversation, hence the students were open to observing, reflecting and learning from each other. Students' experiences of feeling included/excluded, being accepted/not being good enough and strong feelings of a sense of belonging and not belonging show that to the students, this programme is highly authentic and personal.

Contribution

This paper contributes to the discussion on how students learn in action-based learning approaches by showing when and how students create coping mechanisms in complex learning situations (Frederiksen & Tanggaard, 2023). The study challenges learning theories (e.g., Vygotsky, 1978) in that students' learning zones can be stretched quite far as long as they have support to fail, reflect and have time to try again several times. Furthermore, the findings reveal that in contrast to the literature describing action-based EE as "*close* to reality, the students experience the VCP as highly authentic. The paper suggests that team- and individual challenges in an action-based learning approach can easily be overlooked and that students need support from teachers and peers to bring these types of challenge into their conversational space to better enable learning. In practical terms, we argue that normalizing chaos and uncertainty is a good approach to supporting students to cope with team and individual challenges as part of action-based learning.

4.3 Paper III: Time Matters: An Exploration of How Conflict Processes Develop in Short-Term and Long-Term Entrepreneurial Student Teams

Introduction

Teamwork is an integral part of EE and used to increase students' learning of entrepreneurship theory and practice *as well as* the development of essential teamwork skills needed in the entrepreneurial process (Warhuus et al., 2017). Entrepreneurial student teams (ESTs) tend to develop a strong emotional connection to their work (Steira & Steinmo, 2021) and deal with complex tasks under conditions of uncertainty, which can make tensions between team members and conflicts likely to arise/, which can increase the likelihood of conflicts and tensions/disagreements between team members. Conflicts can enhance creativity and innovation in the ESTs. However, they can also hinder learning, motivation and venture performance (Butler and Williams-Middleton, 2014; Näykki et al., 2014). Conflict management processes can mitigate negative effects of conflicts and enhance teams' learning satisfaction and performance (Chen et al., 2017; Khan et al., 2015). However, little is known about how ESTs deal with conflicts. Additionally, in EE teamwork is used for short and long learning processes. In general, there are few studies that have examined how the teams' time frame influences conflict processes in teams. Thus, this paper aims to increase

knowledge about ESTs' conflict processes by exploring: 1) How does time frame influence team conflicts in ESTs? and 2) How does time frame influence how ESTs manage team conflicts?

Theoretical background

Team conflicts are often categorized as related to task, process or relations (Jehn, 1997). In short, task conflicts concern the content and outcome of the task at hand, process conflicts refer to disagreements on how to solve the task, whereas relational conflicts concern differences in team members' personalities, norms and values (Behfar et al., 2011; Jehn, 2008). Although many studies have investigated these three conflict types, we know little about how the teams' timeframe influences the type of conflicts and how they develop. Conflict management can be defined as either pre-emptive (before conflicts occur) or reactive (discussing the conflict and engaging in problem-solving) (Marks, 2001; Rahim, 2002). Furthermore, previous research has been concerned with conflict management styles at the individual level, while we know little about how entrepreneurial teams manage conflicts and also how time influences conflict management.

Method

This study emerged from the data of two other studies in the same context. Team conflicts seemed to be a major concern for the students in both data sets. Process data allowed us to explore the development of conflicts before tensions emerged and through the whole process of conflict management. We could also explore differences between teams that worked for a short period (5 days) conducting a feasibility study, and teams that aimed to develop a new venture together (indefinable length). Although there are several differences between the two types of teams other than length (e.g. self-selected or assigned, task, team size etc.), we argue that we have the necessary data to make a meaningful comparison of the two teams. We followed an abductive logic of inquiry when analysing and comparing the data the extant literature on conflict types and conflict management as well as concepts that emerged inductively from the data. In the end we were searching for similarities and differences *within* short- and long-term teams followed by a similar exploration *between* short- and long term teams.

Findings

We found differences between the short-term and long-term teams in terms of how prominent the types of conflict were and when they occurred. Both type of teams had task conflict, while short-term teams had more relational conflicts and long-term teams more process conflicts. Overall, we found five main conflict management approaches, where short-term teams mostly avoided conflicts and tried to continue working by solving the problem. On the other hand, the long-term teams did make an effort to prevent conflicts, in addition to experimenting and resolving the problem (i.e., the root of the conflict).

Contribution

The paper discusses how the temporariness of teamwork enables different paths for managing conflicts. The findings suggest that research on team-based learning effectiveness can be advanced by considering the time frame for collaboration, as it shapes team dynamics, which also has implications for student learning. This paper contributes to the literature by showing how the temporariness of teamwork enabled different paths for conflict management in the ESTs. Furthermore, we identified three new conflict management approaches in this context: experimenting, solving the situation and resolving the problem. Moreover, we suggest that how a particular conflict ends is not the end of the story, but will be part of the team's history and future dynamic, labelled the "team's conflict learning loop". If the team can effectively solve root conflicts, its members may feel more confident about managing disputes, thus making it easier to engage in discussions when there are diverging opinions. Short-term teams, on the other hand, must balance between avoiding conflicts to focus on tasks and resolving disagreements to ensure good team relations and performance.

4.4 Paper IV: Transformation in the Liminal Space 'In Between' Student and Entrepreneur

Introduction

Entrepreneurship education (EE) is expected to be transformational in the sense that students undergo a change from being students to also considering themselves as entrepreneurs (Nielsen & Gartner, 2017). This paper aims to contribute to the discussion on transformative learning in EE by drawing on the concept of liminality. Kakouris &

Liargovas (2021) propose that learning *through* entrepreneurship which provides students with direct experience of the entrepreneurial process and real-world problems, is inherently transformational. Other scholars emphasize the potential transformational character of emotional events (Lackéus, 2014), exposing students to uncertainty and risk-taking (Arpiainen & Kurczewska, 2017) and specific teaching techniques like pedagogical nudging (Neergaard et al., 2021). However, we know little about how entrepreneurship students experience transformational learning when being in "the thick of it". Thus, this paper aims to explore the question *How do students cope and learn from being in the liminal space "in between" student and entrepreneur?*

In the learning "through" mode the learning is organized as a collaborative effort, often in teams. The positive effect of peer learning is reflected in the EE literature (e.g. Donnellon et al., 2014), however, so are the demanding aspects of teamwork (e.g. González-López et al., 2019). In the concept of liminality, the *communitas*, others who are undergoing the same transitions, provides an essential support when being in liminality. To explore the role of communitas in this context, the second research question is *"What role do peers play in the students' liminal process*"?

Theoretical framework

The concept of liminality represents the notion of being "in between" student and entrepreneur. Being in liminality often has negative connotations, triggering a state of uncertainty, ambiguity and feelings of frustration and confusion. However, in the entrepreneurship literature, some positive features have been emphasized, such as the open space of not knowing when being in between also contains the possibility for new opportunities (Henfridsson & Yoo, 2014) and identity play, which fosters agency, creativity and heightened reflexivity (Kelly & McAdam, 2022b). Based on the paradox of both belonging and not belonging experienced by mobile workers and uncertainty and opportunities that co-exist in the liminal phase, Borg and Söderlund (2015a) propose that individuals can develop *liminality competence* by understanding the value of being in between. In the paper, I explore how students deal with the in-betweenness and the inherent challenges, including uncertainty and ambiguity, in the entrepreneurial learning process.

Method

The paper applies a narrative approach where the process of becoming entrepreneurial is explored through the concept of liminality. Four student narratives are constructed based on process data (including interviews) from their first semester at a VCP and an interview at the end of the programme. The four students were chosen because of the variation in the liminal experiences and diversity in terms of background, gender and personality. The data were analysed by identifying liminal aspects (positive and negative) of the students' learning processes.

Findings

The student narratives are discussed by emphasizing the two main issues experienced when being in between; integrating who they were (competencies and previous experiences) and grasping where they are going (the notion of becoming entrepreneurial). The students found different ways to cope with liminality: seeing failure as learning opportunities, "being both", i.e., juggling between the role as a student and the role as an entrepreneur depending on what seemed most favourable for learning, and emphasising opportunities in challenging situations.

Co-learners were a vital part of the students' liminal process. First, because of the positive feedback that made the students see and appreciate their own qualities, but also through negative feedback as these experiences triggered reflections about previous experiences and their qualities and needs in future teams.

Contribution

The study conceptualizes learning *through* entrepreneurship as a liminal process and illustrates how a "liminal capacity" – an openness to engage in liminal experiences when being "in-between" can support the development of liminality competence. Thus, the paper extends previous literature by suggesting that liminality competence includes the ability to learn in a demanding context characterized by uncertainty, ambiguity and complexity. Furthermore, it suggests that transformational learning is stimulated by positive feedback and support from peers but also by reflection that is triggered by negative and troublesome team experiences.

5.0 Discussion

In this chapter, I will discuss the thesis's overall research question: *How do students learn through action-based entrepreneurship education?* The exploration is based on process data focusing on student experiences and theoretical perspectives on learning, in particular, experiential learning theory and the concept of liminality. I will also analyse the overall findings of this thesis and discuss them in greater depth through the following sub-questions:

1) What are the particular learning challenges in action-based EE and how do students experience and cope with these challenges? (Papers I, II, III and IV)
2) What underlying learning dynamics and scaffolding promote student learning through challenges? (Papers I, II, III and IV)
3) How can the concept of liminality provide new perspectives on how students learn in action-based EE? (Primarily Papers I and IV)

5.1 What are the Particular Learning Challenges in Action-Based EE and How Do Students Experience and Cope with these Challenges?

This thesis examines student learning through exploring *learning challenges* as a phenomenon in action-based EE. In the introduction, I define learning challenges as emotionally demanding experiences related to the entrepreneurial process characterized by complexity, ambiguity and uncertainty. Based on the literature presented in Chapter 2 and the findings in the appended papers, I suggest extending this definition. Hence, learning challenges, as a phenomenon in action-based EE, can be conceptualized as emotionally demanding experiences related to the *entrepreneurial process* characterised by uncertainty, ambiguity and complexity, derived from the *task* of solving real-world problems and teamwork as a *learning structure*. These challenges emerge in a *learning environment* where students are introduced to new roles related to student-centred learning. Consequently, these learning challenges make it both cognitively and emotionally demanding for students, who must find ways of coping with them. Below I will further illuminate some aspects of how this thesis contributes to extending the understanding of learning challenges in action-based EE.

Previous studies show that learning challenges in action-based EE, including uncertainty and ambiguity, interactions with the outside world, open-ended tasks and teamwork experiences, can result in emotional upheaval among students (e.g. Arpiainen & Kurczewska, 2017; Lackéus, 2014; Pittaway & Cope, 2007b). This thesis reveals how the features of action-based EE create learning challenges that are interrelated and that it is the co-existence that often leads to emotionally demanding experiences. This interrelation is exemplified in Paper II through task-, team-, and personal challenges. Furthermore, Papers I and III provide several examples of conflicts. These conflicts typically emerge from real-world problems leading to uncertainty due to conflicting information from external stakeholders that can also be interpreted in different ways, in addition to the complexity that is naturally inherent in such authentic problems. Real-world problems combined with a student-centred learning approach make the learning situation more open-ended and student-driven (Aadland, 2019). The findings in Papers I and III suggest that when students are personally responsible for their learning process and have the freedom to work with projects and ideas that are personally relevant, it puts extra pressure on the team dynamic, which can lead to conflicts.

In Papers II and IV, another consequence of an action-based approach and its inherent characteristics is emphasized, indicating students' experiences of the learning situation. The students do not experience the VCP as a "simulation of reality" or mimicking but as highly real and authentic (Aadland & Aaboen, 2020), even stimulating existential experiences. These perceptions become visible through student experiences of feeling included, acknowledged and having a sense of belonging as well as more negative feelings of being excluded, not good enough and not feeling at home. These are basic human experiences but ones that are not normally discussed as part of higher education pedagogy. In the EE literature, scholars point to the transformational character of EE (e.g. Kakouris & Liargovas, 2021) and entrepreneurship as existential learning (Neergaard & Robinson, 2021). Papers II and IV provide examples of student experiences that acknowledge the authentic nature of an action-based learning approach. Although the students do not take economic risks in the same way as real entrepreneurs, these papers show that they certainly take emotional risks by being personally invested and emotionally exposed in the learning process. In addition, the findings suggest that the totality and interrelations of learning challenges that students encounter in learning *through* entrepreneurship have their own characteristics in that they are highly

authentic, which separates this approach from the broad category of experiential learning. Thus, this thesis adds to the critique of considering experiential learning monolithically (Wright et al., 2022). Exposing students to authentic learning challenges requires skilful scaffolding, which will be further discussed in 5.2 and 5.3.

Previous studies suggest that student-centred learning approaches lead to more variation in student learning based on the different experiences students encounter (Haneberg & Aadland, 2020). Through a process study approach, this thesis also demonstrates variances in how students experience the learning challenges they encounter and how they cope with them. Considering this variance, an important finding is that over time the students develop the ability to find ways of coping with the various challenges and reflect upon their experiences. This is, for instance, illustrated by conflict management approaches, as shown in Paper III, and liminal strategies, as presented in Paper IV. This is interesting because, as shown in Paper II, the students are challenged at the outer boundary of their development zone (Vygotsky, 1978). Hence, this finding feeds into the discussion on student maturity (e.g. Hägg & Kurczewska, 2019), indicating that the students have the ability to find their own ways of coping with challenges without having a recipe or instruction from educators. However, other methods of scaffolding were needed, which I will elaborate on next.

5.2. What Underlying Learning Dynamics and Scaffolding Promote Student Learning Through Challenges?

Experiential learning theory (Kolb, 1984) holds that knowledge is created through the transformation of experience and is widely applied to understand how entrepreneurs learn (Wang & Chugh, 2014). After all, entrepreneurship is about taking action under conditions of uncertainty, hence the ability to learn from these experiences is crucial to develop in the entrepreneurial role (Cope, 2005). However, Kolb's learning cycle (1984) has also been much criticized (see section 2.3.1 for details), among other things, for ignoring the dynamic, social and emotional nature of entrepreneurial learning. As these dimensions are found to be central dynamics for student learning in the appended papers, I suggest a new model (see Figure 1) where these missing structures and dynamics are taken into account. The model and the further discussions aim to add to the underdeveloped literature on *how* students learn *through* entrepreneurship.

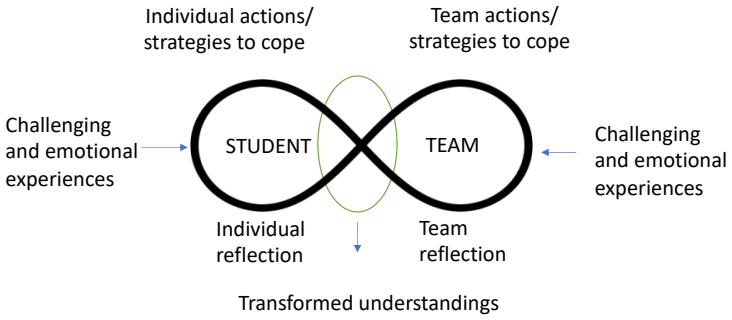

Figure 1 Student learning process in action-based EE

This model with the *lemniskat* (loop) in the middle, highlights the fact that the students learn through a number of cycles, where they encounter challenging and emotionally demanding experiences as individuals and as part of a team. These challenges require the students to reflect and find ways, or more systematic strategies, to cope with them. The loop allows for the learning modes to transfer in more dynamic ways. Sometimes from experiences to actions and then to reflection, and on other occasions in the order of experience, reflection and action. For instance, findings in Papers II, III and IV suggest that the students were likely to start with a critical experience and, through reflection, develop coping strategies, or as observed at the beginning of the programme, go directly to coping without reflecting in a substantial manner. Furthermore, the loop has two "eyes", indicating that these learning processes occur both at the individual and at the team level.

This learning on two levels is an important contribution of this thesis. The middle of the learning loop has a circle to emphasize that the continuous interactions between co-learners stimulate transformational learning in this context. For instance, Paper IV emphasizes that both positive and negative team experiences support the development of new understandings. Negative feedback and experiences may challenge existing perspectives or ways of being that had previously been taken for granted, whereas

positive feedback helped reinforce ways of acting that ultimately served to shape the students' entrepreneurial being. The feedback from co-learners appears valuable because the students work closely under a great deal of pressure, which makes visible both strengths and weaknesses. They become vulnerable to each other. This enables deeper and more authentic levels of reflection (Rogers, 1961). Additionally, the relationship between the students can be described as transactive, not simply interactive (Itin, 1999), implying that the individual student brings her/his learning through experiences, actions and reflections to the student team and vice versa. Thus, it suggests that the exchange between the individual and team level is the main source of (transformational) learning in this context. This way of understanding student learning has implications for how to teach, which I will come return to in section 5.4.

The learning loop illustrates another important matter found in Papers II, III and IV. The formation of new understandings and actual transformed understandings of the entrepreneurial process and themselves in an entrepreneurial role takes time and emerges from several rounds of challenging experiences. The importance of having several opportunities to act and to fail without severe consequences is crucial for these novice entrepreneurs. In Paper II, process data show that in the beginning, the students experience almost everything as chaotic and uncertain, but over time they gain a sense of mastery from organizing some of the chaotic elements (e.g. dealing with complex and diverging information). Coping with state uncertainty, in Millikens's (1987) terms dealing with "what is happening out there" (McMullen & Shepherd, 2006), seems, therefore, to be learned after several rounds of acting and failure. Although effect uncertainty (how will it impact me?) and response uncertainty (what am I going to do about it?) (McMullen & Shepherd, 2014; Millikens, 1987), may be more difficult to control, after several loops the students also seem to be more accustomed to taking action under conditions of uncertainty, experiencing that taking action leads to new situations and opportunities as observed by Hatt and Jarman (2021). Paper III on conflicts provides, in this case, an interesting perspective on time, where the short-term teams were found to apply different conflict management strategies than the long-term teams. In contrast to the short-term teams, the long-term teams knew they had several opportunities to act and fail as a team, but as conflicts can have severe consequences in the event of failure, the long-term teams put more effort into preventing conflicts and dealing with the root of the problem. This is illustrated by the conflict learning loop,

where effective strategies for dealing with disagreements can positively feed back to the team dynamics.

However, in a complex learning environment the students will not necessarily succeed, even after several attempts. As shown in Papers I and III, conflicts may not be solved adequately and the students may experience unexpected setbacks in performance, as illustrated in Papers II and IV. Reflection is essential for learning from these cases. After facing a critical event, Brookfield (1987) proposes self-examination of the situation and reflecting together with others who share the same (or a similar) experience. For many students, reflection with their co-learners was demanding in the early phase of the learning process. However, after a short time, task challenges became part of the conversational space (Baker et al., 2005), whereas the more personal challenges required more time to share. Normalization of failures, as emphasized in the literature (e.g. Cope, 2011; Lattacher & Wdowiak, 2020; Souakri et al., 2023) seems to open the conversational space in terms of task failures. Paper II points to the potential for educators to also normalize challenges related to team and individual issues, which according the findings, include the most emotionally demanding experiences.

To sum up, this thesis suggests that the student learning process in action-based EE includes the modes of the experiential learning cycle (Kolb, 1984) but that it is far more dynamic, going in loops instead of cycles. Furthermore, the modes simultaneously oscillate between the student and the team. Whereas section 5.1 emphasizes *what* needs scaffolding (i.e., emotional learning challenges), section 5.2. deals with *how* scaffolding can be implemented (i.e., interactions between co-learners, time and several rounds of trial, failure and reflection).

5.3 How Can the Concept of Liminality Provide New Understanding of How Students Learn in Action-Based EE?

This thesis suggests that learning through entrepreneurship pushes students into liminality. The original liminality literature stemming from social anthropology defines liminality as being *betwixt and between* (Turner, 1967). This notion has been further developed in the learning literature exemplified by the threshold concept, where liminality describes the learner on the threshold of a new understanding, - a space where

the learner can easily become "stuck" (Meyer & Land, 2006). In the first paper, this latter notion of liminality is applied to understand team processes when being challenged and explore more specifically the process of being stuck to becoming unstuck. Liminality is here applied at team level, that, to our knowledge, is a new perspective in the liminality literature.

The findings from Papers II and III show, however, that in a challenging learning environment where students create their own venture, the whole learning process can be seen as a liminal process. Hence, in Paper IV, the concept of liminality is applied to explore the student's learning processes in the transition to becoming entrepreneurial. The students are challenged by new expectations of their role as students, through challenging team dynamics, including conflicts, real-world problems and lastly, the core challenge of EE; to act under conditions of uncertainty. The students feel uncertain and not in control. However, the vulnerability in the liminal space opens up for new ways of thinking and acting.

This thesis suggests that developing liminality competence is a way of enabling transformational learning in entrepreneurship. Borg and Söderlund (2015a; 2015b) found that individuals with high liminality competence both thrive under liminal conditions and use the possibilities that liminality offers, as it represents uncertainty but also opportunities. Based on the findings provided by the explorative and processual approach applied in this thesis, I suggest that there is an essential step on the way to developing liminality competence, which is that the students are able to remain open[5] to experiences, and thus learning, when being in liminality. I label this as developing *liminal capacity*. To learn, the students need to engage in the learning process and deal with the various challenges they encounter, often getting stuck and coping with negative aspects of liminality in terms of uncertainty and ambiguity, frustration and (identity) confusion. As being in the liminal space often feels uncomfortable, the natural impulse is to find a way out, leaving liminality behind (Meyer et al., 2008). However, such an exit also deprives the student of the possibilities for transformed understanding as a result of overcoming learning challenges.

[5] This expression was introduced by co-author Marte Konstad in a conference paper, which later resulted in Paper I.

Liminal capacity can thus stimulate change in students' attitudes in that challenging experiences of uncertainty, confusion and frustration can be a rich source of learning. As shown in the student narratives in Paper IV, a liminal capacity opens up new opportunities and promotes creativity to find new ideas and ways of acting. Thus, developing a liminal capacity is the first step towards liminality competence, where students not only deal with but also initiate change.

5.4 Facilitating Learning Through Challenges in Action-Based EE

As described in section 2.2.2, there is an ongoing discussion among EE scholars regarding student maturity, level of proficiency and, subsequently, their need for guidance and scaffolding. For instance, Neck and Corbett (2018) propose moving towards self-directed learning, where students are more self-driven in dealing with learning challenges. On the other hand, Hägg and Kurczewska (2020a) note that novice students who have not yet acquired the ability to engage in reflective thinking will most likely struggle to engage in self-directed learning activities with little support and instructions from teachers. One of the core questions in this debate is what type and how much scaffolding students need in order to learn.

The present thesis adds a new perspective to this discussion related to action-based EE, which places heavy emphasis on collaborative learning and activities (Rasmussen & Sørheim, 2006). As discussed above in section 5.2., collaborative learning facilitates a transactive point in between co-learners that enables transformative learning (see Figure 1). Essential scaffolding in action-based EE can, therefore, be enabled by co-learner interactions. Hägg and Kurczewska (2020a) posit that it is a gradual process that prepares students to deal with uncertainty and later makes them even more comfortable when facing uncertain entrepreneurial situations. When this learning process is not a lonely journey but experienced side-by-side with co-learners it can provide a proper scaffolding to motivate students to engage in the learning challenges. However, as shown in the appended papers and previous literature, team members do not only provide support and new perspectives; teamwork can also lead to conflicts and co-learner interactions can give rise to negative experiences. To enable learning in such a complex context, the educator must, therefore, create a learning environment that finds a balance between challenge and support.

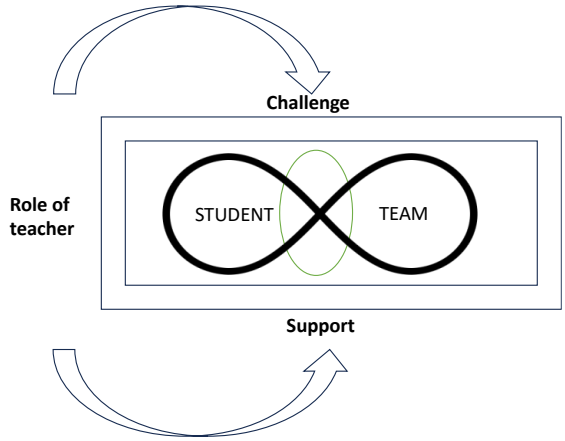

Figure 2 Educator's role in action-based EE

Figure 2, therefore, illustrates the need for the educator to balance between exposing students to challenges, while simultaneously providing support to contain the demanding learning process. Although instrumental structures are important for supporting students (e.g. time to reflect individually and in teams), emotional support, in line with findings in the study by Klyver et al. (2018), seems most essential. The educator must be able to contain (Bion, 1961) students' emotional responses and struggles. However, in terms of available time and resources it is not realistic for the educator to provide such support on an individual basis. Therefore, the educator should instead emphasize strengthening the quality of the relationship between co-learners and facilitate a learning environment that promotes collective learning and development instead of individually-oriented performance and competition. This will strengthen the notion that students regard each other as the most important source of support, feedback, knowledge exchange, reflection and ultimately, of learning.

Following the argument that the "golden space" for learning is the transactions between co-learners, another implication is that the educator should not necessarily be focused on aiming for "perfect" team dynamics and performance but rather facilitate learning through students' reflections on their actions. It underlines the importance of the *process* in learning, where the students reflect on their experiences of coping with learning challenges (and potential failures) in ways that make them better equipped to deal with

similar challenges in the future. In this perspective, conflicts and negative experiences can be a source of learning. However, such learning will more likely develop if the students have a feeling of being at home in their learning environment and a basic trust in their co-learners.

6.0 Conclusion and Implications

This dissertation has investigated in depth how students learn *through* entrepreneurship, a topic that is underdeveloped in the field of EE. The overall question is explored through the four appended papers that aim to provide knowledge by focusing on student processes and development over time. Paper I, a pilot study, introduces the concept of liminality and explores how student teams go from being stuck to becoming unstuck. Paper II explores the phenomenon of learning challenges and how students experience and cope with the various challenges they encounter in action-based EE. Paper III examines a well-known learning challenge at team level, namely conflicts, and how short-term and long-term teams manage various conflicts. Lastly, Paper IV explores the liminal process of four students in a VCP and the role of co-learners in their transformational process. The cover essay consolidates the four papers and provides a conceptual and theoretical background for discussing the paper's findings. This discussion emphasizes the main contributions of the thesis, which are summarised below.

This thesis does not suggest throwing students into deep water, hoping for the best and that they will learn to swim eventually. Nor does it propose structuring and guiding the students step by step in the best possible way through the entrepreneurial process. Instead, it recommends exposing students to learning challenges, to real-world problems and uncertainty based on the principles of student-centred learning, i.e., providing an authentic and hands-on learning environment. As a consequence of being complex and filled with uncertainty and ambiguity, it is emotionally demanding. Therefore, sufficient support must be provided by creating a culture that values co-learners and by allowing enough time and several opportunities to fail and to reflect.

6.1. Theoretical Implications

The thesis has important implications for the literature on entrepreneurial learning and entrepreneurship education. First, based on the empirical findings of the process studies in this thesis and in line with previous critiques of experiential learning theory (Kolb, 1984), this thesis suggests a loop model to illustrate central aspects of how students learn in action-based EE (see Figure 1). This model shows that student entrepreneurial learning is a continuous and "messy" process, moving back and forth between learning

challenges, team and individual reflections, as well as actions, emphasising that this dynamic movement often begins with an emotionally demanding experience. Furthermore, the loop serves to illustrate the importance of time and making students aware that they have several opportunities to try and fail. Moreover, the model acknowledges the social part of learning (and the entrepreneurial process) and that it is the transactive nature of interactions between co-learners that stimulate students' transformed understandings of the subject matter and also of themselves. The central role of co-learners in an action-based learning environment is emphasized and adds a new perspective to the discussion on the level of scaffolding needed in a complex and challenging learning environment.

Second, this thesis contributes to the EE literature by showing how learning *through* entrepreneurship pushes students into liminality, where they must deal with uncertainty, ambiguity and confusion of being in a position of not knowing but still needing to act. I argue for the relevance of liminality competence, originally from the organizational literature, in this context and further suggest that "liminal capacity" constitutes an essential step to developing this competence. The concept of liminality and its way of thinking about uncertainty is suggested as a relevant perspective to explore student learning in action-based learning settings.

Lastly, this thesis feeds back to the liminality literature by integrating two streams of liminality literature, one from social anthropology, later adapted in the organizational and entrepreneurship literature, and one from the field of education, where liminality is regarded as part of threshold concepts. Methodologically, I suggest applying liminality at team level and analysing (learning) processes when teams go from being stuck to becoming unstuck. Lastly, I suggest the term "liminal capacity" as a way of describing the willingness to engage in uncomfortable and uncertain states of not knowing, (related to what has previously been described as a "fight-response" (Berg et al., 2016)).

6.2 Implications for Teaching and Learning Entrepreneurship

The core practical implications of this thesis are elaborated on in subsections 5.2 and 5.4 and suggest that to enhance learning in this context, the educator should find a balance between exposing students to learning challenges and supporting them by

providing a safe space for exploration and failure. I argue that such support is best provided through strengthening the quality of relationships between co-learners and facilitating a learning environment that promotes collective learning and development instead of individually-oriented performance and competition. This can be implemented from the very beginning by creating a culture that values students sharing with and supporting each other and by providing frequent and low-threshold structures (preferably in small groups) that make it less frightening to make mistakes, disagree with others and openly reflect on learning challenges.

According to van de Pol et al. (2010), the presentation of the reasons why something is worth learning can scaffold student affect. Thus, introducing the concept of liminality and how this open, uncertain and often uncomfortable space can provide opportunities for creativity, while new ways of thinking and being can motivate students to bear uncertainty in such challenging situations. Liminality can further provide a language that makes an uncertain and ambiguous setting more tangible and renders demanding emotional experiences easier to share with fellow students because of having a common language.

Lastly, this thesis offers implications for policymakers in higher education by suggesting that action-based learning approaches that expose students to learning challenges and liminal spaces should be emphasized if the goal is to promote transformational and deep learning among students. Such programmes and courses will probably need more resources, in terms of faculty and time, than more traditional learning approaches. However, such resources are required for scaffolding learning that enables students to be reflective actors with the ability to deal with complexity, uncertainty and initiate change.

6.3 Implications for Further Research

This thesis responds to a call to extend knowledge on how students learn in EE and, more specifically, what works and what does not work in experiential learning approaches, where learning through entrepreneurship is an example. The thesis shows that process data enable theory development on, for instance, the underlying dynamics of learning among student entrepreneurs. Thus, the thesis offers suggestions for what

works in this context. A suggestion for further research is to study how the findings of this thesis apply to experiential and action-based approaches in other (national) contexts. In addition, there is a need for process studies in other contexts to develop more knowledge on how experiential learning approaches, which include demanding learning challenges, should be designed. Individual factors, for instance, previous experience and motivation, will likely influence how students learn in challenging settings (Pintrich & Schunk, 2002; Politis, 2005a). Moreover, this thesis is mainly based on data from one semester (although Papers III and IV include data from the whole VCP). Hence, process studies that explore student learning throughout an EE programme - and perhaps also follow students after graduation, will probably provide new and interesting insights into student entrepreneurial learning. Furthermore, a relevant avenue for further research would be to design mixed-method studies that can discuss the specific outcome of a programme/course in relation to the learning processes leading to these outcomes.

Lastly, this thesis indicates that the concept of liminality is helpful in a context where learners deal with uncertainty. The notion of uncertainty as part of liminality can be further explored on a conceptual level but also through empirical studies. An example could be to further draw on the notion of liminality competence (Borg & Söderlund, 2015a; 2015b) and liminal capacity (as suggested in this thesis) and explore if these are useful concepts in scaffolding student learning through challenges.

6.4 Concluding Reflections

Based on the findings in this thesis, I suggest exposing students to learning challenges – and supporting them in finding ways of coping in collaboration with their co-learners. At the end of this cover essay, I want to emphasize the wider context of student learning. There is an increasing individualization in society that naturally influences the field of (higher) education, where it materializes through a focus on individual performance and achievement, as well as measurement of students' skills and knowledge. Knowledge is also increasingly measured against the immediate usefulness of its content, often without a critical reflection regarding for what or why. These shifts can increase student motivation towards achieving good results but not necessarily engaging in troublesome and time-consuming collaborative learning processes.

Consequently, the type of learning advocated by this thesis can in itself be a challenge to facilitate. At the same time, I argue that the development of reflective and collaborative skills in complex and challenging situations is as important as ever.

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PART II:
APPENDED RESEARCH PAPERS

CONTENTS APPENDED RESEARCH PAPERS

Paper I: In liminality: Interdisciplinary Teams Learning Through Challenges
Sigrid Westad Brandshaug and Ela Sjølie
Status: Published

Brandshaug, S.W., & Sjølie, E. (2021). In liminality: Interdisciplinary teams learning through challenges. *Higher Education, Skills and Work-Based Learning*, *11*(2), 406-419.

Paper II: From Chaos to Learning – How Students Learn from Challenges in Action-based Entrepreneurship Education
Sigrid Westad Brandshaug, Roger Sørheim and Ela Sjølie

Status: Submitted to an international peer reviewed journal.

Paper III: Time Matters: An Exploration of How Conflict Processes Develop in Short-term and Long-Term Entrepreneurial Student Teams
Sigrid Westad Brandshaug and Iselin Mauseth Steira

Status: Under review by the journal Education and Training.

Paper IV: Transformation in the Liminal Space 'In Between' Student and Entrepreneur
Sigrid Westad Brandshaug

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Research Paper I:

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Sigrid Westad Brandshaug
Ela Sjølie

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Sigrid Westad Brandshaug
Roger Sørheim
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Sigrid Westad Brandshaug
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Transformation in the liminal space 'in between' student and entrepreneur

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ABSTRACT

This paper builds on the literature on transformative learning in entrepreneurship education by drawing on the concept of liminality. Scholars have argued that entrepreneurship education should provide experiences that challenge students to think differently about their skills and abilities while developing entrepreneurial attitudes that render them capable of coping with rapid societal changes. The study takes a narrative approach to an in-depth exploration of students' liminal processes in a venture-creation programme: How do the students cope with and learn from being in the liminal space 'in between' student and entrepreneur? The findings suggest that students find different ways of coping with liminality and that peers play a vital role in students' transformational processes by providing feedback and stimulating reflection. By exploring the 'black box' of student learning processes in entrepreneurship education, this study contributes to the literature on transformational learning and how individuals become entrepreneurial. Moreover, this paper builds on the literature by suggesting how learning *through* entrepreneurship can help develop liminality competence.

1. Introduction

Entrepreneurship education (EE) is expected to be transformational in the sense that individuals undergo a change from being students to viewing themselves as entrepreneurs (Nielsen & Gartner, 2017). To facilitate this process, Neergaard et al. (2021) argued that EE must provide experiences that challenge students to think differently about their skills, abilities and experiences, thereby changing their mindset from merely seeing obstacles to perceiving possibilities for themselves in the future. Kakouris and Liargovas (2021) proposed that learning *through* entrepreneurship by engaging in the entrepreneurial process and real-world problems provides experiences that are inherently transformational. This learning approach develops entrepreneurial attitudes (vs. knowledge and skills) that make participants capable of coping with rapid societal changes. The *through* mode is a process-based and experiential approach of which uncertainty and ambiguity are significant parts (Pittaway & Cope, 2007).

Previous research has recognized and examined EE's transformative potential, facilitated by different methods and approaches. For instance, Lackéus (2014) found links between emotional events and the formation of entrepreneurial identity, and Donnellon et al. (2014) suggested that engagement in creating a new business helps students become entrepreneurial. Arpiainen and Kurczewska (2017) proposed that it is possible to develop competencies related to risk-taking and coping with uncertainty through education, thereby emphasising EE's transformative nature. Recently, Klapper and Fayolle (2023) suggested a transformational framework for sustainable EE by emphasising factors such as authentic problems, dialogue between learners and meaningful learning that involves

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heart, body and mind. Furthermore, Neergaard et al. (2021) found that pedagogical nudging techniques, which encourage students to consider other possible behaviours, can provide a transformative learning environment in which students reflect on and become more aware of their qualities. As the literature indicates, studies have pointed towards the transformational character of learning *through* entrepreneurship (e.g., Arpiainen & Kurczewska, 2017; Kakouris & Liargovas, 2021; Neergaard et al., 2021). Simultaneously, we know that experiential and action-oriented learning environments can be highly emotional and demanding for students (González-López et al., 2019; Lackéus, 2014). Entrepreneurial endeavours are not always successful and can include negative aspects that students engaging in the entrepreneurial process may experience[1] (Shepherd, 2019; De Sordi et al., 2022). To date, relatively little extant research has examined EE's *through* mode of learning, how students learn by doing and how they experience being in the 'thick of it'. To obtain a deeper understanding of student transformational learning, these processes must be explored in depth over time by employing perspectives that acknowledge different vital dimensions of human change and learning.

The concept of *liminality* (Turner, 1967; Van Gennep, 1909/1960) has received increased attention in management and entrepreneurship studies because of its capacity to capture the social, emotional and temporary elements of the transformational process (Söderlund & Borg, 2018). Liminality, meaning 'threshold' or 'border', originally was a concept from anthropology related to analysing rites of passage within tribal sociocultural systems (Van Gennep, 1960). As Thomassen (2015) described it, 'Simply put, liminality is about how human beings, in their various social and cultural contexts, deal with change' (p. 40). Liminality is a phase of uncertainty and ambiguity, as well as creativity and transformation, that also characterises the *through* mode in EE. This paper aims to build on extant knowledge about student transformative learning in EE by drawing on the concept of liminality. To this end, the first research question is: *How do students cope and learn from being in the liminal space 'in between' student and entrepreneur?*

Moreover, in the *through* mode, learning is organised as a collaborative effort, often in teams. The main arguments are that collaboration increases learning about specific entrepreneurship content (cf. Vygotsky, 1978) and that teams reflect the reality of how most entrepreneurs are organised (Karlsson & Nowell, 2021). Therefore, peer influence in learning-by-doing situations is emphasised in the EE literature (Donnellon et al., 2014; Fauchald et al., 2022; Rasmussen & Sørheim, 2006). Although collaborative learning methods can exert a positive effect on student well-being by reducing perceptions of isolation and lack of support (Mali et al., 2023), several studies in the EE context point to teamwork as being demanding for students (González-López et al., 2019; Pazos et al., 2022; Pittaway & Cope, 2007). Rose et al. (2019) even suggested that teamwork constitutes its own liminal space in EE. In the liminality concept, peer relations are described through the idea of *communitas*, which provides essential support for the individual undergoing the liminal transition (Turner, 1969). However, few extant studies have examined the role and significance of communitas. Thus, this paper's second question is: *What role do peers play in students' liminal process?* Here, *peers* refer to fellow students in a course or programme, on a team or in the wider entrepreneurial community in which students engage in a learning process.

The phrase 'betwixt and between' originates from Turner (1967) and concerns capturing liminality's essence because the present study's entrepreneurship students were viewed as being in between the roles of student and entrepreneur. The research questions were explored through students' narratives based on real-time data and interviews. The narratives entail each student's learning processes during an action-based two-year venture-creation programme (VCP) in which the students worked in teams to develop their own businesses (Rasmussen & Sørheim, 2006). Thus, these students experienced the 'double expectations' of being both university students and student entrepreneurs (Gaggiotti et al., 2020; Haneberg et al., 2022). Furthermore, in a VCP, most learning activities are team-based; thus, this context can offer valuable insights into peers' role in the transformational process.

For clarity, the terms *transformational* and *transformative* processes are applied in the present paper to describe potential outcomes of students' learning in liminality. These terms are related to transformative learning, which Illeris (2014) defined as 'changes in the learners' identity' (p. 573). Thus, potential changes in the students' perspectives are not only cognitive, but also include all dimensions of mental activity and exclude less-critical learning (Illeris, 2014). The term *entrepreneur* refers to individuals who can act entrepreneurially, and the terms *entrepreneur* and *entrepreneurial* will be used interchangeably in the text.

The present paper makes two main contributions to the literature. First, by exploring the 'black box' of student learning processes in the *through* mode, it contributes to the literature on transformational learning in EE and how individuals become entrepreneurial. Second, this paper builds on the literature by suggesting how learning *through* entrepreneurship can help develop liminality competence. Furthermore, this novel perspective on entrepreneurship students being 'in between' offers both practical implications and questions for further research.

2. Theoretical framework

2.1. Being 'in between' and the liminality concept

In the present paper's context, liminality refers to the transformational process of students being 'in between' students and entrepreneurs. Turner (1969) viewed liminality as having three characteristics: a transformation of state; a changing of status and oscillation between old and new understandings. Liminality describes the transition process and state of being that a person making the transition experiences (Van Gennep, 1960). Through liminality, this person is in an 'in-between' place that bridges 'what is' and 'what

[1] In the present study, I defined the students in the VCP as being in liminality per se because they were all 'in between' in the sense that they entered the programme with student status, and they all expected to develop entrepreneurial competencies through the VCP and become entrepreneurial. This concept application differs from Van Gennep's (1960) original use in that the students do not necessarily reach the incorporation phase, in which they obtain full status as entrepreneurs.

can or will be' – the old and the new. In the present study's case, the students were *no longer* engineering/social science/business students while also *not yet* entrepreneurs—or as Turner (1974) put it, 'neither here nor there, betwixt and between all fixed points of classification' (p. 232).

Through its characterisations, liminality emphasises the temporal dimension, the subjective emotional experience and the social dimensions of a transformation process (Meyer & Land, 2006; Rattray, 2016; Söderlund & Borg, 2018). First, the *temporal* dimension is associated with three phases, as Van Gennep (1960) put forth initially, in which the individual experiences 1) a separation from one's existing environment, routines and status; 2) a liminal phase or transition in which learning emerges; and 3) an incorporation phase into a new status and role in society.[1]

Second, liminality is a phase of uncertainty and ambiguity (Garsten, 1999) that represents a subjective *emotional* component of experiencing doubt, frustration, confusion and anxiety. Simultaneously, liminality also entails hope, potentiality, opportunities, creativity and transformation (Beech, 2011; Garcia-Lorenzo et al., 2018; Ibarra & Obodaru, 2016). However, the limbo of having no specific status provides possibilities for playfulness and new ways of doing things. Turner (1979) describes it as 'a time of enchantment when anything might, even should, happen' (p. 465).

Third, social guidance is another central aspect of liminality, as described by Turner (1967), in the form of *communitas*, comprising others going through the same liminal passage. An equivalent to the communitas described in traditional rituals are peers in an education programme that provides social support and a point of comparison to help shape a student's self-understanding (Ibarra & Obodaru, 2016). Felten (2016) pointed further to the importance of developing confidence from a sense of belonging in threshold crossing. In this respect, the entrepreneurial student team can function as a 'home' for the student's transformation process. However, previous studies on EE often have examined the team level in learning (e.g., Karlsson & Nowell, 2021; Steira & Steinmo, 2021) or the individual level (e.g., Neergaard et al., 2021) without paying enough attention to the interaction between these two levels, which communitas represents.

Scholars have argued that crossing the liminal space can lead to acquiring skills and knowledge, as well as elicit a change in self-perception (Meyer & Land, 2006) and how the learner views, feels about and experiences the world (Rattray, 2016). Thus, the liminal space triggers new ways of thinking and practising, thereby replacing old ways (Meyer & Land, 2005). As Conroy and O'Leary-Kelly (2014) suggested, the liminal space can engage individuals in sensemaking and emotional regulation to determine who they used to be, who they are, whom they are becoming and whom they would like to become. They argued further that the liminal process involves cognitive and emotional processing regarding loss and restoration orientation. In the context of EE students, this is a question of whether they must let go of their identities as engineer/social science/business students to create a new identity as entrepreneurs.

The literature has acknowledged that learners are very different in terms of liminal experiences; thus, what is transformative for Person A may not be for Person B (Heading & Loughlin, 2018). Some students may become 'stuck' when facing one type of challenge, while others may find it stimulating and motivational (Brandshaug & Sjølie, 2021), or resist entering the liminal phase in the first place (Meyer & Land, 2006). Thus, the liminality phase is different for all students, and each student's trajectory from being a student to viewing themselves as entrepreneurs is different.

2.2. Liminality in entrepreneurship

The notion of liminality has been applied often in organisational literature to explore 'liminality at work' (e.g., Beech, 2011; Garsten, 1999; Tempest & Starkey, 2004), such as mobility project workers' experiences (e.g., Borg & Söderlund, 2015a; 2015b). Beech (2011) argued that liminality provides a way of thinking about the 'more longitudinal experience of ambiguity and in-betweenness within a changeful context' (p. 288). In the entrepreneurship literature, liminality has offered a lens through which to explore the challenges, dilemmas and opportunities that entrepreneurs experience in various settings, including institutional entrepreneurs (Henfridsson & Yoo, 2014), academic entrepreneurs (Hayter et al., 2021), women digital entrepreneurs (Kelly & McAdam, 2022), entrepreneurs running an online home-based business (Di Domenico et al., 2014) and necessity entrepreneurs (Garcia-Lorenzo et al., 2018). It is common in the organisational and entrepreneurship literature for liminal experience to trigger a paradox of both belonging and not belonging (e.g., Borg and Söderlund, 2015b; Kelly & McAdam, 2022), which captures the very notion of being 'in between'.

Being in liminality often has negative connotations, but in the entrepreneurship literature, the more positive features tend to be emphasised, e.g., how opportunities can exist side by side with current trajectories (Henfridsson & Yoo, 2014), how necessity entrepreneurs creatively deal with the entrepreneurial process (Garcia-Lorenzo et al., 2018) and how the liminal space triggers identity play that fosters agency, heightened reflexivity and creativity (Kelly & McAdam, 2022). Liminality's paradoxical notion, which Jeremiah et al. (2020) described as 'fuelled by opportunity, but clouded in uncertainty and ambiguity' (p. 1), is close to the reality of entrepreneurship, the very essence of which is to act on opportunities under conditions of uncertainty (e.g., Sarasvathy, 2008). However, although the ideal approach is to act, this is certainly demanding, particularly for novice entrepreneurial students.

2.3. Liminality competence

Borg and Söderlund (2015a, b) have suggested, through their empirical studies on mobile workers, that individuals have varying 'liminality competence' levels. They have referred to previous studies that found individuals with higher liminality competence levels perceive liminality as a positive element of work, e.g., through increased freedom (Garsten, 1999) and by taking advantage of learning opportunities (Tempest & Starkey, 2004). Liminality competence depends on how individuals perceive the work they perform, and individuals with high liminality competence both thrive under liminal conditions and use the possibilities that liminality offers (Borg &

Söderlund, 2015a, b). Borg and Söderlund (2015b) proposed that liminality competence can be developed by understanding the value of in-betweenness, embracing the insider-outsider role and translating liminal experience through reflexivity. Pantic-Dragisic and Borg (2018) suggested further that it is possible to develop a higher liminality competence level through formal training and by promoting activities that go beyond the one-sided focus on particular knowledge, skills and abilities, and emphasising how individuals perceive being in liminal positions. Entrepreneurship scholars also have discussed liminality competence (e.g., Chen et al., 2021; Hayter et al., 2021); however, the development of liminality competence has not been explored in EE research yet.

To sum up, liminality has been suggested in the literature as a valuable concept with which to explore transitions and experiences of being 'in between', both in the context of mobile workers and in various entrepreneurial settings. In this paper, I propose that liminality can capture the complexity of students' transformational processes, thereby adding new and essential insights to the EE literature. We know little about how students deal with the challenges, paradoxes, uncertainty and ambiguity in education approaches that are expected to be transformational. The present study applies liminality to explore student narratives in depth regarding their subjective emotional experiences of ambiguity and uncertainty in their learning processes.

3. Methods

3.1. Study context and case selection

Given the scarcity of research on transformational learning in EE and on attempts to understand these processes as a liminal phase, this paper applied an exploratory narrative approach and is part of a larger research project that explores students' learning experiences in action-based EE. The project aims to develop knowledge on how students manage and learn from the challenges they encounter in an action-based learning context. With the aim of exploring the process of becoming entrepreneurial, i.e., how students cope and learn as part of communitas in the liminal phase, it was necessary to go in depth into some students' subjective emotional experiences. Thus, 4 of the 36 students who participated in the project were chosen for an in-depth analysis. The four students were selected based on two main criteria: 1) Their liminal experiences participating in the same programme varied and 2) they had diversity in terms of disciplinary background, gender and personality.

In this particular VCP, the students were expected to learn by practising entrepreneurship, so the programme was well-suited for observing EE's potential transformational power as it takes place. In the first semester, the students conducted feasibility studies in teams as the main activity. A feasibility study is a preliminary exploration of an idea's business potential to identify or discard the idea as a possible start-up. This process was repeated five times during the semester. The teams' composition, as well as the origin of the business ideas that the teams evaluated, differed every time. In the subsequent three semesters, the main basis for entrepreneurial learning was the start-up, which the students developed from one of the ideas from feasibility studies. Both the task of conducting a feasibility study and the venture-creation process entailed considerable uncertainty and ambiguity (Haneberg & Aadland, 2020).

3.2. Data collection

I observed 36 students from August–December 2019 during their first semester of the VCP, when they worked in different teams conducting feasibility studies. At the end of the semester, the four selected students were interviewed about their experiences and what they viewed as critical events. Prior to the interviews, each student drew a timeline, and during the interviews, they elaborated on the 'ups and downs' they had encountered. In April 2021, during their fourth and final semester, the students were interviewed once more, this time about their experiences creating their own ventures and the critical events for them in this process. The conversations again focussed on their pre-drawn timelines. Furthermore, they could comment on their perspectives from the first interview. The students also were asked to reflect on their learning from the first semester through the last semester. An overview of the data collection is provided in Table 1.

3.3. Narrative approach and data analysis

The present study employed a narrative approach, telling four students' stories. There were several reasons for choosing a narrative strategy. First, narratives are well-suited to address the complexities and subtleties of students' learning experiences by illustrating the temporal notion of experience and recognising that one's understanding of people and events changes (Mertova & Webster, 2007), as the present study aimed to illuminate. Narratives also can provide a holistic conception of an issue and illustrate how it is addressed in

Table 1
Data collection.

Data collection	Description
Observation	Teams were observed while working on the feasibility study. Detailed notes were taken. The four students were observed on three different teams during the first semester.
Group reflections	Open sharing (evaluation and feedback) after each feasibility study; recorded and transcribed; duration: 45–80 min. Relevant to this study are what the four students shared with their team and the feedback they received from their peers.
Interview 1	End of the first semester. Semi-structured interviews on critical events; duration: 50–75 min; recorded and transcribed.
Interview 2	End of the final semester. Critical events, team experiences, and reflections on learning; duration: 55–80 min; recorded and transcribed.

practice. Few narratives can provide 'thick descriptions' (Geertz, 1973), and a high degree of authenticity that cannot be achieved with large samples (Golden-Biddle & Locke, 1993). This makes the narrative approach particularly appropriate for studying learning processes, particularly critical learning events (Mertova & Webster, 2007).

Second, as Jeremiah et al. (2020) noted, 'liminality is present long before the onset of change; researching liminality is, therefore, about examining the spaces before, during and after change occurs' (p. 7). Thus, process research that employs a narrative strategy can help illuminate the 'whole story' to provide a more coherent understanding of the liminal experience (e.g., Beech, 2011; Borg and Söderlund, 2015b; Muhr et al., 2019). Third, a narrative is viewed as a credible source of knowledge for theory-building in entrepreneurship research (Larty & Hamilton, 2011). Entrepreneurial identity has been highlighted as a particularly fruitful area for narrative research, as a strong link appears to exist between how entrepreneurs tell their life stories and how they run their businesses (Johansson, 2004). Thus, novice entrepreneurs' 'life stories' from the VCP could offer insights from the beginning of their potential transformation into entrepreneurs by identifying different motivations and 'critical events' that constitute their emerging stories. As Johansson (2004) nicely put it, 'We are in the middle of our stories and do not yet know what the end will be' (p. 275).

The narratives were constructed mainly based on the interviews, during which the students reflected on their challenging experiences and learning, in addition to group reflections. However, observations were important in providing a better understanding of students' liminal experiences in terms of context and their peers' role. The empirical data from the interviews and team reflections were loaded into NVivo 12 data analysis software, then analysed by identifying liminal aspects of the students' learning processes using liminality identifiers discussed in the literature (Muhr et al., 2019), including confusion, uncertainty, ambiguity, frustration, multiple identity positions, feeling out of control and identity struggles (e.g., Beech, 2011; Czarniawska & Mazza, 2003). Likewise, students' experiences related to hope, potentiality, opportunities, creativity and transformation were analysed to identify potential ways of coping with liminality (Borg & Söderlund, 2015a).

As Riessman (2008) noted, the researcher and research participant jointly construct the narrative and meaning, and what events are viewed as meaningful. What is presented below is only part of the students' stories, emphasising what I, as the author, viewed as the most important in exploring the study's aim.

4. Students' narratives

In this section, I present the liminal experiences identified in the four students' analyses. Although the students encountered several challenges during the two-year programme, some experiences seemed particularly important in their process of becoming entrepreneurs. Peer relations were central to all four narratives.

4.1. Helen

Helen, a female student with an education background in social sciences and economics, was hard-working and enjoyed tackling practical and open-ended problems. Thus, engaging in an entrepreneurial process came naturally to her. Based on earlier negative experiences of being excluded and bullied, Helen expected team relations to be the most challenging part of being a VCP student. Unfortunately, in her first team experience, she had a conflict with a teammate, M, and her negative expectations were confirmed. They simply could not communicate with each other, as Helen felt that M would neither listen to her views and suggestions, nor trust the information she had gathered. She felt that M, as an engineer, looked down on her for being educated at a 'simple college university': '*I felt stupid and, simply, a little useless. (….) So, I thought that if this is how a feasibility study is, then I do not want to be part of this*'. At that point, Helen considered quitting the whole programme.

In Feasibility Study 4, two months later, Helen experienced more strife with team members. This time, the students were assigned to teams of 8–10 people to test highly technical ideas at CERN. Helen did not find the idea or the team itself very motivating, and her frustration peaked when she offered to help some team members who were struggling with writing the report. They rejected her offer, and as in Feasibility Study 1, she felt useless and left a team meeting angry. Some team members went after her, told her it was a misunderstanding, and invited her to contribute. She then put significant effort into writing the report, which the other team members greatly appreciated. Looking back on that week, she viewed Feasibility Study 4 as the most valuable in terms of learning. '*Nothing motivated me, but I learned to keep going, even though everything was crap*'.

Interestingly, Helen reflected on a substantial change in how she experienced team challenges from Feasibility Studies 1 to 4. She felt that she was not good enough on the first team and considered quitting the programme. In Feasibility Study 4, she felt that she was good enough, but the others did not see it. '*Initially, I questioned whether I could be in a programme with engineers. I would be looked down on for the whole semester. However, by Feasibility Study 4, I had learned that I have quite a lot to offer, but it was frustrating that it was not used*'.

In the second semester, Helen was motivated to start working on her business idea, and she was pleased that several of her peers wanted to join her team. Although the start-up idea had been developing for two years, Helen could not build a stable start-up team during this period, with team members joining, then leaving often. At two points in the programme, she was the only start-up team member left. Several factors contributed to the heavy turnover: the COVID-19 pandemic, changes in the business idea and team members having different ambitions and preferences. Furthermore, Helen became frustrated because she could not find someone with whom she had a 'perfect fit'. The same pattern as in the first semester was repeating itself: On several occasions, Helen tried to do most of the work herself.

However, during this same period, Helen had a positive team experience outside the VCP as an 'employee' of an established start-up company. There, she found what she had been missing on the VCP teams: people with the same hard-working mentality and an

environment where she could be creative and curious, and have fun—with 'stupid' questions appreciated. In Helen's view, the start-up was an absolute dream team, and she appreciated the opportunities and responsibilities that the team leader gave her and how the team included her. However, working on her own start-up while working in the established start-up *and* writing a thesis turned out to be too demanding in terms of work hours, and at one point, she became physically and mentally burned out. However, she said that she would never regret joining another start-up company. '*To try and fail is very motivating to me because I can potentially learn a lot. There is value in it*'.

4.1.1. Helen's reflections on her liminal process

During the first semester, Helen realised that she enjoyed challenges related to business ideas. When other team members wanted to pivot and find another idea, she refused to give up. She found it exciting to look for ways to get around problems and was able to engage the people around her in this creative process. As she gained more entrepreneurial experience through the programme and while working with different people, she began to understand that her work capacity and mentality were somewhat unique, having a set of attributes that she could use to create something new. Her experiences during the two-year period changed how she viewed herself: '*I see very few limitations in myself compared with before. I probably thought more often that I was not good enough or intelligent enough, but now, I think the opposite. So, I have gained a lot more self-confidence to try*'. Before she entered the VCP, she wanted to start a business, but needed to believe that she had the tools to do it. By the end of the programme, she realised that she could use her qualities to develop ideas into a business. Because she felt confident in these qualities, she could start looking for people who complemented her. At the end of the programme, Helen saw few limitations in what she could achieve in the future and also felt that this transformation put some pressure on her to achieve something in the future.

Helen emphasised team members and peers' role as critical factors in changing how she viewed herself and her qualities. Her peers' positive feedback made her feel valuable: '*It's, in a way, a kind of confirmation from others that I have not received before*'. This confirmation made her realise that her qualities were somewhat unique and that this was not just an assumption in her head. Simultaneously, team relations were still the most challenging part of the entrepreneurial process. Based on feedback from others and her reflections, she wondered whether one source of her team problems was her fear of depending on others: '*Because people are, in the end, more unpredictable than an idea and a technology, which you can twist and turn*'. However, the varying team experiences made her realise that she must find the courage to look for team members whom she would view as irreplaceable—people she could not manage without. At the end of the programme, she was both motivated and optimistic that she would find such people soon.

4.2. Susan

Susan, a female student with a background in social sciences, had experience as a leader within student organisations before entering the VCP. However, in the programme, she took on the role of a 'flexible team member', preferring to be more in the background. Susan experienced a challenging start as a VCP student. In the first feasibility study, she had no idea where to begin, what to do or how she could be a helpful resource on the team. Furthermore, one team member took on a dominant leadership role, which made Susan reluctant to take the initiative. She felt useless and lost, and doubted herself. Therefore, Susan Googled information on her computer instead of asking other team members for information and help. In the group reflection at the end of the week, she openly shared that she felt overwhelmed during the first weeks of the VCP. '*I feel like I have lost a little bit of myself. I am feeling like, "Susan, this is not you" '*.

On her own, and as a parallel process, she also was thinking a lot about the role of an entrepreneurship student. Initially, her picture of the 'preferred student' in the programme was that of an extroverted man with an engineering background who was motivated to start a business for economic reasons. At the beginning of the first semester, this idea guided her observations, which confirmed her assumptions. As a relatively introverted woman with a background in social sciences and ambitions to create societal value, she asked herself whether she could fit in as a student in this programme and as an entrepreneur. She said she felt like she was in a class with 30 copies of Petter Stordalen, a successful and highly extroverted Norwegian entrepreneur, and felt that she could not identify with this role. However, after working with other people in the first feasibility study, she realised that the programme comprised different types of people. It made her think that the faculty at the VCP wanted different types of people and that there was no 'one answer' to how you should perform as an entrepreneurial student. She started to change how she approached her role as a student in the programme and had a 'pep talk' with herself, saying, '*I must make this work. I am going to fix this*'.

Her team members on various teams acknowledged her efforts and development, and gave her positive and specific feedback that encouraged her to take a more active role and take more initiative. At the end of the first semester, she said, '*I feel I know much better what I am good at now*'. Furthermore, the experience of being on different teams helped her change her approach from trying to adapt and needing to be more confident to searching actively for team members with whom she could thrive. For Susan, the most valuable learning experience from conducting the five feasibility studies on different teams was getting to know herself better and who she was on a team. '*Now, I know who I can collaborate with quite well, and that is 'down-to-earth' people, not those aiming to become millionaires. I want to work with people who will listen to me and who can see me as a competent team member*'.

Susan was satisfied with her start-up team. Although it was not personal qualities, but rather shared interest in the business idea that brought the three team members together, they found that they had formed an effective team. Susan was the creative person who saw opportunities, the second team member was the critical voice interested in numbers, and the last member was a doer and diplomat who helped the other two understand each other better. In the beginning, Susan found it challenging that they had pretty different working styles and ways of thinking, but she appreciated that they all were humble and could listen to each other. It helped her become more confident in her competence as a non-engineer. The team was motivated to work on the start-up and made significant progress.

However, after three months, the COVID-19 pandemic made testing and further developing their product idea impossible because it was a sustainable solution for big festivals. They kept working to find different approaches, but failed and had to end the business after five months, which saddened Susan.

To continue playing a role in the innovation community, Susan applied for part-time positions in different student organisations, but did not land any. She was very disappointed because, unlike how she had felt as a new student in the VCP, she viewed herself as competent and felt that she had what it took to 'make things happen'. Eventually, she landed a position as a business developer at a newly established company, but found it challenging to be thrown into the position without much training. However, she realised that her experience with the VCP had made her competent in managing uncertainty and quickly understanding different markets. Because many of the ideas were highly technical, she confirmed that her background in the social sciences was crucial in bringing new and relevant perspectives into the business development process.

4.2.1. Susan's reflections on her liminal process

Susan's positive experiences applying her entrepreneurial skills and attitudes in a context outside the VCP was a vital confirmation for her: *'Now I know that this has been the proper education'*. The experience of having to end the start-up she had put so much effort into, made her think that the start-up world was not for her and she could not picture herself starting a business again. However, she was eager to use her entrepreneurial competence at other organisations. Susan felt much more self-confidence at the end of the programme. From feeling neither like a social science student (because of her initial doubts about relevance in this context) nor like an entrepreneur (because of her perceptions of entrepreneurs as being extroverted male engineers), in the end, she felt like she could integrate her education background into the entrepreneurial role, thereby being 'both/and'. Susan was able to focus on her strengths, rather than her weaknesses, and was more willing to try new things. This change started during the first semester, when she decided to take on a role for which she had no qualifications. Her attitude was that the VCP was a place to learn, and she aimed to try different team roles and experiment with different ways to solve problems.

4.3. Peter

Peter, a male student with a disciplinary background in engineering and economics, described himself as rational and calm. He experienced ups and downs, but none of his experiences was very emotional or difficult to manage personally. The only exception might have been the first feasibility study, in which he was on a team in which one team member assumed an informal leadership role that Peter found problematic. This member's attitudes and behaviours led to misunderstandings, and he felt that other team members did not dare raise their voices. This dynamic caused conflicts and a lack of shared competence in the team, which Peter viewed as unfavourable to the team's learning process and results. He felt excluded in a way he never had experienced before. This experience gave him a new perspective on how to lead a group, emphasising the importance of being inclusive and committed.

Overall, Peter focussed on creating effective team dynamics on his teams. For the rest of the semester, he worked to include and motivate all team members to participate and use their competencies. Peter felt that the teamwork had improved throughout the first semester. With Feasibility Study 5, he found that a highly diverse group of five people from different backgrounds could share different opinions and views on problems, products and solutions effectively. Unlike Feasibility Study 1, in which he felt like giving up at one point at the end of the semester because of the dominating group leader, Peter felt that he could contribute to a healthy team dynamic. He found that improved team dynamics made the work feel more rewarding and increased work quality.

At the end of the VCP, the start-up looked very promising. It had been a long process, and during the year and a half of working on it, they had changed their initial business idea and the market they planned to target. Peter experienced many ups and downs during this period. The most challenging time was when they were waiting for support from a technology-transfer service and felt that they had waited in vain because the company did not offer what they had promised. It took a significant amount of time and energy, and was frustrating for the team members, but Peter saw no reason to give up. Instead, it pushed him to go 'all in' in his role as chief technology officer (CTO), and during the following summer holiday, he invested time and money to learn machine learning from scratch. It was a tough summer, but he viewed this competence would add value to the start-up. It also changed how he perceived his role as CTO. At that point, he felt that he had grown into the role. Simultaneously, his ambitions for the start-up increased, and he believed that their business idea could succeed.

The situation with the technology transfer office was one of several examples of times when the team experienced being stuck and not knowing what to do. To remain motivated, Peter remembered that the start-up was, after all, an academic course project, and that the goal was to maximise learning outcomes. This helped him not to take setbacks personally, but rather view them as learning experiences. Furthermore, because they continued to work despite the hurdles, they experienced their ideas becoming relevant again several times.

4.3.1. Peter's reflections on his liminal process

Because of their diverse backgrounds, building a shared understanding among team members regarding both problems and solutions was challenging for the feasibility and start-up teams. Therefore, Peter implemented structures that helped them, as a team, regularly share their understanding of the idea and check their assumptions about what others were doing and why. However, Peter was very pleased with his team and how they used their strengths and competencies. Peter thought of himself as a specialist, pushing the technology forward. Peter did not view the challenges that he experienced as personally demanding, and found the experience of facing hurdles to be the most valuable: *'Of the ups and downs, I have learned that you always find a solution to the downs. That is perhaps the biggest lesson I have learned: You just have to keep looking, and something comes up. Then most of the problems can be solved'*. At the end of

the VCP, Peter was motivated to continue working with the start-up. If it failed, he planned to try again. He thought that, with all his new experience, developing something would go much faster the second time.

4.4. Jimmy

Jimmy, a male student, described himself as a minority in the VCP because he was older than most of the other students, had a social science background and was not motivated by technology or profit. Furthermore, he was driven by intrinsic motivation, while he initially perceived most of his peers to be driven by achieving results, rather than learning. Jimmy struggled during the programme to find his 'home' and peers with whom he could work. '*It is probably a bit self-inflicted, but I don't feel like an integrated part of the class …. I feel more like on the outside* (….)' He said the VCP was his first experience feeling like he did not belong.

Jimmy had a very explicit and specific motivation for becoming an entrepreneurship student. He wanted to learn the business development tools necessary to create the organisation he had dreamed of for eight years. Almost all his education efforts in the previous few years were part of a plan to fulfil that dream, but his learning experiences in the VCP were different from what he expected. He struggled to find his role, integrate his disciplinary competence and motivate his team members to share his passion for learning and reflection. In the first semester, he worked hard to find an idea he could be passionate about and a team he believed in. Unfortunately, at the end of the semester, the ideas he liked did not qualify for business development, and the two peers he wanted to collaborate with found other teams. This was a paradox in many ways, as he was very clear from the start that he valued team relations highly. However, he received some negative feedback from one of the team members that he greatly appreciated, forcing him to reflect on his role: '*He said that I often listen, but respond as if I did not because it is so important for me to share my point of view. I think that is very true*'.

During the two years of the VCP, Jimmy functioned as an instigator, challenging his peers and the faculty's decisions and approaches. His motivation was to improve the learning environment, which he felt was too focussed on results (at the expense of process) and narrow economic values (at the expense of societal values). He was very clear about his motivation for becoming an entrepreneur: to increase quality of life. Jimmy described a meeting with one of the educators as a turning point, when he finally got the message: '*Jimmy, I do not know what to do with you because you do not fit in anywhere*'. However, the educator also said Jimmy should do what was essential for him and, thus, agreed that he could start developing his dream. For Jimmy, this was an opportunity to put all his effort into developing the idea he was deeply passionate about. Thus, at the end of the first semester, he was filled with doubt and uncertainty about his role in the class and whether he would feel even more excluded, while still filled with hope and expectations for the chance to work on his idea. Jimmy said that to walk alone, he had to have self-confidence: '*I must say that I chose this because I believe in it, and that is enough*'.

Jimmy pointed to an event during the second semester as being of importance. During a plenary meeting with the whole programme and faculty, a peer from the second-year cohort spotlighted Jimmy as an excellent and inspiring example of someone who finds motivation in things other than profit and that faculty and students should give such ideas higher priority. For Jimmy, this statement meant a lot, and during the third semester, he had a much better attitude. '*I do not know if it is because I feel more confident in who I am, what is important for me and what my project is, but I actually feel closer to the mainstream at this time*'. Throughout the programme, he worked independently, with little contact with his peers, but he maintained his self-confidence and belief in the value of developing his project.

4.4.1. Jimmy's reflections on his liminal process

In reflecting on what he learned from the VCP, Jimmy emphasised that he now has a better understanding of how to develop an organisation and that the market decides what is good information and a good idea, not him. Although this is foundational knowledge for an entrepreneur, it is not transformational in terms of how he views himself. Jimmy thought that feeling like an outsider made him grow because he had to think more about what was essential to him and why—and be able to communicate and justify his ideas to others who might think differently. He felt that his opinions were held to a higher standard, making him more conscious of his own assumptions and the value of testing this line of argumentation on others. He did not mention other ways that 'others' had been important. Although Jimmy still was critical of the programme when he departed, and was a bit sad about not finding his 'home', he still had confidence and hope for the future to achieve his long-held dreams.

5. Analysis and discussion

This paper view student learning *through* entrepreneurship as a liminal process. The study explores in depth how students cope with and learn from being in the liminal space 'in between' student and entrepreneur, along with what role peers play in students' transformational processes. The narratives reveal liminal experiences related to the challenges and opportunities that students encounter when they are 'in between' student and entrepreneur. Such an understanding of transitioning between roles is common in the liminality literature (e.g., Borg & Söderlund, 2014; Hayter et al., 2021). However, the narratives also suggest that this particular context, learning *through* entrepreneurship, triggers another type of liminal experience related to taking part in a complex learning environment 'filled with uncertainty'. These liminal experiences are discussed in this section based on the students' narratives. I then provide examples of how students cope with the liminal phase before discussing their peers' role. Finally, I suggest what liminality competence can imply in EE.

5.1. 'In between' student and entrepreneur

The narratives illustrate two main issues of being between student and entrepreneur: the challenge of *integrating* what they were (i.e., previous competencies and experiences as an engineering/business/social science student) and the challenge of getting a notion of where they are heading (i.e., what does it mean to be an entrepreneur). First, as Van Gennep (1960) described it, the liminal phase starts when the individual separates from the old status and state of being. In contrast to previous studies on entrepreneurship, in which individuals at some point choose to pursue an entrepreneurial career (e.g., Garcia-Lorenzo et al., 2020; Kelly & McAdam, 2022), the present study's students all were placed in the position of being 'in between' when starting at the VCP – both physically, as they separated from their old peers and education communities, and mentally because the VCP introduced a new way of thinking and acting compared with their core disciplines.

The four narratives illustrate very different experiences of being 'in between' the roles of a student and entrepreneur, which is in line with the literature that has explored liminality among students (e.g., Brandshaug & Sjølie, 2021; Heading & Loughlin, 2018; Meyer et al., 2008). However, common among all four students was the feeling of not being acknowledged for their competence and perspectives in a new and complex learning environment. These experiences made them feel lost, useless, excluded or like outsiders. The findings resonate with the literature describing identity struggles in liminality (e.g., Beech, 2011; Czarniawska & Mazza, 2003). Peter's liminal experience was brief because its origin was a conflict with a team member on his first team, where he felt excluded. This experience hit him hard, and for the rest of the programme, he put extra effort into creating team environments in which inclusion and integration of each member's competencies were prioritised. For Susan and Helen, the feeling of not being acknowledged was a highly emotional and turbulent experience for the first semester of the VCP before they found their roles and ways to contribute later.

Jimmy's narrative was a paradox because he had a clear understanding of his 'preliminary state' when he entered the programme, how his competence could be useful in the entrepreneurial context, and what skills and knowledge he lacked. He also had an explicit motivation to participate in the programme and knew what it meant for him to be entrepreneurial. However, Jimmy struggled to find ways to integrate his disciplinary competencies and find room for his understanding of being an entrepreneur within the programme. He seemed open and relaxed about engaging in a liminal process in a complex learning environment, but regarding his academic background and perception of societal value, he felt like a minority. He did not find a 'safe home' to use as a foundation in which to integrate his competencies and values. Instead, he assumed an oppositional role.

Previous studies have indicated that the liminal experience can trigger a paradox of both belonging and not belonging (e.g., Borg and Söderlund, 2015b; Kelly & McAdam, 2022). Although the other students had a feeling of not belonging at the beginning of the programme, after some time, they found ways to belong. However, Jimmy never found his 'home'. His initial perceptions of himself in the roles of student and entrepreneur did not change much. Perhaps he was not open to fully engaging in the liminal process, thereby blocking his ability to transform. Jimmy's initial motivation was to learn specific entrepreneurial skills and knowledge, but a liminal experience also includes the risk of changing self-perceptions and how 'we view, feel about and experience the world' (Rattray, 2016, p. 67). Such a liminal space is certainly a vulnerable place to enter if a long-held dream is deeply rooted in self-perceptions and worldviews that already have been reflected upon and evaluated thoroughly, as in Jimmy's case.

In contrast to the original descriptions of liminality as a rite of passage (Van Gennep, 1960), the students did not obtain the status of entrepreneur when they left the VCP. Instead of having a formal status or role, the incorporation included the students' understanding of themselves as entrepreneurs. Susan's narrative provides an excellent example of this process, in which she initially had a typical liminal experience of being confused and lost, 'not knowing who I am' (Kiley & Wisker, 2009). At the beginning of the programme, she felt like she was neither the social science student she knew, nor the novice entrepreneur she was expected to be. For Susan, a critical moment in her liminal experience was becoming aware of her thoughts about what an entrepreneur is. During the first semester, she rejected the stereotypical idea of an entrepreneur as a typical heroic (extrovert) masculine figure. She practised some form of mimicry to adjust to what she thought was expected of her (Kiley & Wisker, 2009). However, through several experiences on different teams and in various contexts, and through her coping in liminality, she found evidence that her competence was valuable. Over time, she managed to integrate competencies from her disciplinary background, personal qualities and the skills and mindset she learned from entrepreneurial activities, creating a new self-conception of being entrepreneurial. Her liminal experience illustrates how students' learning processes can relate to forming alternative entrepreneurial identities (Hytti & Heinonen, 2013). Overall, the student narratives illustrate how their understanding of what it means to be an entrepreneur (or entrepreneurial) opened up to being broader, more nuanced and more personal and authentic (Byrne & Shantz, 2023).

5.2. Coping and learning in liminality

After some time, the four students found ways to cope with being 'in between'. This process started early in the programme with personal reflections and 'pep talks' with themselves. Although all four students initially experienced the negative aspects of liminality, they did not give up or use 'flight strategies', as previous studies found (Berg et al., 2016), but rather tried to boost their self-confidence. The narratives illustrate that over time, they found the learning situation to be an opportunity to learn and experiment with new roles and actions. As Helen put it, their experiences made them see the value of failing. This way of thinking about challenging situations was not new to them, but was developed further by how the educators communicated learning in this *through* mode (Haneberg & Aadland, 2020; Pittaway & Cope, 2007).

Peter's narrative also provides an example that, although the students worked on developing a business, his aim was to learn. He used the status of 'being in between' as an opportunity to have multiple identities, as found in previous entrepreneurship and management literature (e.g., Czarniawska & Mazza, 2003; Nielsen & Gartner, 2017). In this position, he could benefit from both positions.

During challenging periods, he viewed himself as a student in a learning situation and that whatever happened with the start-up, he would learn something valuable for later entrepreneurial efforts. This attitude made it easier for him to handle periods when the team got 'stuck' (Ellsworth, 1997; Meyer & Land, 2005) and to keep working on the start-up because a new opportunity suddenly could develop as their concept emerged. Peter's narrative supports previous studies suggesting that some individuals acknowledge being 'in between' and take advantage of it (Borg & Söderlund, 2015a; Tempest & Starkey, 2004). Ibarra and Obodaru (2016) noted that being 'both' is better than being 'neither' when undergoing liminality; thus, the student narratives demonstrate how being 'in between' can be a challenge when feeling 'neither' like a student nor an entrepreneur, as well as an opportunity when feeling 'both'.

Furthermore, the narratives illustrate several examples of the students' ability to stay open to new opportunities or actively search for new opportunities when in liminality. For instance, Susan did not give up searching for a position in the innovation ecosystem when her start-up failed, and Peter took courses in machine learning when their collaboration with the technology transfer office sputtered. They perceived learning as a process and demonstrated an attitude that if one door closes, another opens. For example, the meeting with the faculty was challenging for Jimmy, an outsider who had no team and had to work alone. However, through this meeting, he confirmed that he should follow his passion and work on his ideas. These examples demonstrate the duality in the liminal experiences of frustration and confusion on one hand, and hope and opportunities on the other (Beech, 2011; Ibarra & Obodaru, 2016). After having some challenging experiences in the VCP, the students seemed to have developed liminality competence to manage the negative aspects of being in liminality and turn these into opportunities. These liminal experiences illustrated EE's overall aim very well, in line with Neergaard et al. (2021), enabling students to change their mindset from merely seeing obstacles to perceiving possibilities for themselves in the future.

5.3. The role of peers

Peers were a vital part of the students' transformational processes, providing social support and a point of comparison that helped shape the students' self-understanding (Ibarra & Obodaru, 2016). Comparisons with others on different teams made them view their qualities and strengths more distinctly, and the positive feedback they received was vital for building self-confidence. Support from peers undergoing the same liminal phase was essential to the critical liminal experiences during the VCP. For Susan and Helen, the feedback they received in the alternative arenas outside the VCP was also important to confirm their initial beliefs that they had something to offer in an entrepreneurial setting. Thus, these narratives demonstrate the importance of peers in other arenas. We can draw from the narratives that it is essential for support, in terms of feedback, to be personal and specific, as well as provide a feeling of mastery.

Interestingly, negative experiences with their 'core peers' (i.e., team members) were also an essential part of the students' liminal experience—and, thus, learning—because the more negative aspects of being in liminality triggered a need for reflection among the students. These troublesome experiences helped shape their self-understanding by stimulating reflection about who they were regarding their values, motivations and needs. Helen's narrative illustrated this, as she had experienced several troublesome experiences with fellow team members, which made her reflect on past experiences and her typical behavioural patterns. This exemplifies how experiences with peers can push students into liminality and what has been pointed out as a uniquely intense period of development that could yield insights into both past and future experiences (Thomassen, 2015; Van Gennep, 1960). Through her reflections and over time, Helen came to acknowledge that although it felt emotionally demanding and frightening because of her past experiences, the next unavoidable step in succeeding as an entrepreneur was to find team members whom she felt were irreplaceable and to become an interdependent entrepreneurial team. In this respect, her experiences and reflections on team (and peer) relations added valuable insights for creating effective entrepreneurial teams in the future (Brattström, 2019; Harper, 2008).

The value in terms of reflection and self-understanding based on negative experiences with peers adds new empirical insights to previous studies that emphasise the importance of a team for learning (Lackéus, 2013; Pittaway & Cope, 2007) and of being in a community with other learners that provides feedback and a supportive environment (Donnellon et al., 2014; Howorth et al., 2012; Mali et al., 2023). Moreover, Jimmy's narrative illustrates that the absence of 'core peers' removes vital communitas while in liminality. Thus, the absence of such communitas might inhibit transformational learning.

5.4. Developing liminality competence

Borg and Söderlund (2015b) proposed that liminality competence can be developed by understanding the value of in-betweenness. The students in this study were not mainly concerned with balancing academic demands and new venture creation, in line with Gaggiotti et al. (2020), but rather with the feeling of losing their previous identity as an engineer/social science/business student and not properly grasping their new identity as an entrepreneur. However, after some time, they integrated their disciplinary competence into the entrepreneurial process and felt more comfortable finding a more authentic way of acting entrepreneurially in terms of motivation, values and roles. I suggest that this transformation is related to their competence in dealing with a liminal learning environment. Thus, in this context, liminality competence is also an ability to act, experiment with and discover opportunities in a complex learning environment filled with uncertainties and ambiguities. The liminal experience, as such, can provide students with an attitude for dealing with complexities, uncertainties and ambiguities, providing a complementary competence to the knowledge and skills needed to be a successful entrepreneur. Mastering such liminal experiences enhances students' self-confidence in acting entrepreneurially, but liminality competence is not restricted to the entrepreneurial process, but in a broader sense also can help deal with change, as Thomassen (2015) noted.

6. Conclusion and implications

Scholars have pointed to EE's transformational potential to provide a setting in which students can experiment and learn to discover who they are and who they can become (Neergaard et al., 2021). The present study explored the transformational process of student learning in EE, which can be conceptualised as being in liminality, i.e., 'in between' the role of student and entrepreneur. The study has taken an in-depth student perspective over time to better understand students' transformational experiences in EE, which can be emotional, highly personal and developmental. The four students' narratives illustrate very different journeys through liminality, even though they participated in the same programme. The differences are in line with Land et al. (2005), who suggested that (the process of) learning is best described as a root branching out in all directions with multiple points of entry and exit. However, some similarities were found on an overarching level regarding how the students coped with being in between. All four narratives revealed an overall motivation to learn through failure and to remain open to new opportunities during the liminality phase. Transformational learning is enabled through reflecting on values, needs and goals, as generated by positive feedback from peers *and* negative and troublesome team experiences.

This study conceptualises learning *through* entrepreneurship as a liminal process. The narratives indicate how a 'liminal capacity' – an openness to liminal experiences when being 'in between' – can develop liminality competence (e.g., Pantic-Dragisic & Borg, 2018) in this context. Furthermore, this study builds on the literature by suggesting that liminality competence also entails the ability to learn in a demanding context. It describes an ability to go from the negative aspects of liminality that, in many ways, characterise the entrepreneurship context (uncertainty, ambiguity, confusion and identity struggle) and turn them into opportunities, hope and transformational learning experiences.

In practical terms, a learning-*through* approach exposes students to liminal situations. Liminality competence cannot be developed by observing others, but must be learned through personal experience and a feeling of mastering coping with liminality. Furthermore, this study suggests that supporting and challenging communitas and a sense of belonging are essential to developing a willingness to engage deeply in a liminal learning process. These insights has important practical implications. First, they illustrate the importance of facilitating a safe learning environment that enables student reflection on how they perceive themselves in the role of an entrepreneur, as well as experiments on how their competencies can be relevant in the entrepreneurial process. Second, peer relations are essential and can be emphasised in several ways; therefore, educators should acknowledge the potential for learning in the ecosystem outside of education programmes and provide opportunities for collaborative experiences on several different teams. Notably, negative team experiences facilitated reflection and learning because positive team experiences and acknowledgement by peers followed them. Third, Jimmy's narrative illustrates that a lack of 'home' and communitas can hamper learning. One reason in this case may have been misalignment between the programme and the student's goals. Thus, it is important to explore students' motivation before they enter nontraditional education programmes, of which learning *through* entrepreneurship is an example.

Finally, thinking about challenging entrepreneurial learning processes through the lens of liminality, as presented in this paper, can scaffold student learning. Teachers can present the concept of liminality explicitly, including the importance of supportive communitas, to motivate peer learning. Liminal thinking also can be emphasised by presenting uncertainty, ambiguity and (identity) confusion (cf. negative aspects of liminality) as points of departure to identify new opportunities and new ways of seeing the world and one's own competence levels (cf. positive aspects of liminality). Thus, demanding learning experiences can enhance the ability (cf. liminality competence) to deal with core challenges in the entrepreneurial world.

This paper's results offer several directions for future research to address some of the present study's limitations. The narrative approach provides authentic descriptions that can resonate with readers, offer new perspectives and suggest new practices related to student transformational learning. However, in Weick's (1979) terms, narratives are less focussed on simplicity and generality (Langley, 1999). Thus, more specifically, the low number of participants included in this paper is a limitation that calls for further research to apply the findings as a basis for designing a quantitative study that allows for a broader sample of students. Finally, this study has illustrated some complexities in the role of peers in student learning, but future studies can explore in-depth relationship qualities further that help develop liminality competence.

CRediT authorship contribution statement

Sigrid Westad Brandshaug: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Writing – original draft, Writing – review & editing.

Data availability

Data will be made available on request.

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Appendices

Interview I (December 2019)

INTRO: 1) Research purpose 2) Procedures regarding research ethics 3) About the interview (e.g. *your* experience) 4) Questions?
Interview guide:

1. Challenges.
a. Can I see the timeline? How was it draw it?
b. Can you elaborate on what you have drawn?
c. Can you draw a new line that says how you experienced the challenges? (Ex: very frustrated/confused by a small challenge, unproblematic with a big one).
d. Start with the most demanding challenge.
i. What happened?
ii. How did you experience it? What did you feel? What did you think?
iii. How did the team deal with the challenges?
iv. Which actions by individuals in the team would you say were central to the situation? (As a contribution to solving/ not changing/aggravation).

v. Looking back: What types of challenges have been most demanding for you/for the team to deal with? Has it changed along the way?
If what I perceived as a challenging situation during observation is not mentioned, check it out!

2. Professional competence.
a. How has it been to connect what you have done in the feasibility studies to your professional competence from previous studies?

b. Do you have any tools/methods/ways to think from your field of expertise that have been helpful in the challenges you have encountered?

3. Group process
a. How would you describe the dynamics of the various teams you worked in?

b. What would you say were your most important contributions to the team?

c. What role did you take in the various teams? (From Benne & Sheats (1948)

If what I have seen during observation is not mentioned, check out!

e. Which team did you enjoy the most? What causes it? (Hackman: Effective teams)
f. In which team were you most satisfied with the result? What causes it?
g. In which team would you say you learned the most? What causes it?

4. Learning
a. When you look back on the semester with feasibility studies. What is the most important thing you have learned? (Academic, about working in a group, personal) Use timeline.

b. What experiences would you like to highlight that have contributed to this learning? Use timeline.

c. Which frameworks/tools/guidance from the faculty, if any, have been important? Use timeline.

5. Ability to handle challenges
a. Has your experience of challenges changed during this semester? If so, how? Examples.

6. Closure
a. Is there anything else you would like to add or elaborate on?
b. Is there something that you think was not made clear enough earlier in the interview?
c. Is there anything you would like to say about which I have not

Interview II – April 2021

INTRO Repeating research purpose 2) Repeating procedures regarding research ethics 3) About the interview (e.g. virtual interview: sound, etc. 4) Questions?

Interview guide

1. We spoke after the feasibility studies in December 2019. How have you been since the last time?
2. Are you in a startup now? What do you/your team work on?
3. Timeline as a starting point.
a. How was it to fill in?
b. What have been critical events for you and possibly your team after the feasibility studies?
c. What challenges have you experienced? (Ups/Downs).
d. Possibly comment on the timeline. What has contributed to it looking like this?
4. In the interview in December 2019, you talked about x (Brief summary of key points/challenges from the first interview). How do you see this today? /How do you experience this today? If it has changed, do you have any thoughts on what contributed to the change?
5. Which experiences from the feasibility studies have been useful in working with startups?
6. What role have you taken in the teams you have been a part of after the feasibility studies?
7. What roles have been more challenging for you?
8. How would you say that the teams you have been a part of have influenced you and what you have learned at ES?
9. Are there any individuals who have been central to you in your learning process?
10. If you think back to yourself in August 2019, when you started at NSE, and today. What is the most important thing you have learned? (Personal and professional).
11. Closure
Is there anything else you would like to add or elaborate on?

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