

The interplay of teachers' epistemological frames in student learning in corporate entrepreneurship in higher education

Sanna Ilonen, University teacher in entrepreneurship, University of Turku
Jarna Heinonen, Professor of Entrepreneurship, University of Turku

Abstract

This study focuses on the teachers' epistemological frames in student learning in EE. Drawing on the three epistemological frames that teachers exhibit during their teaching – 1) delivering knowledge, 2) guiding knowledge construction, and 3) making space for collaborative and iterative knowledge construction (Chakrin & Campbell, 2022) – we explore how teachers' epistemological frames shape student learning in corporate entrepreneurship and entrepreneurial behaviour in higher education. Our qualitative study focuses on a bachelor's level course on CE and investigates learning reflections of 12 students coming from six different teams, which all provided a team exercise report of their team exercise, CE movement. We found that different students rely on different frames and they may move between the frames during the CE course suggesting the interplay of the frames. Students do not necessarily accept the frames suggested by the teachers. In addition, institutional frame of university teaching in general and/or administration may guide student learning. The best performing teams were able to escape such institutional frames and used the CE movement, i.e. team exercise of the course, as a space for their collaborative and iterative knowledge construction. Our study contributes to research on EE by introducing teachers' epistemological framing to student learning in EE. Furthermore, the study contributes to literature on teachers' epistemological framing as the topic has not been extensively studied in EE which is an interesting context given its experimental nature. Based on the findings of our explorative study we suggest avenues for further research and provide implications for educators and students in EE.

Keywords: framing, corporate entrepreneurship, entrepreneurial behaviour, entrepreneurship education

Introduction

Recent research on entrepreneurship education (EE) has addressed the ways in which students learn in different contexts (Thomassen et al., 2020). EE entails not only in 'for' EE. i.e. for new venture creation and start-ups, but also other types of educational interventions needed to foster entrepreneurial behaviour and innovative activity in organizational setting. Corporate entrepreneurship (CE) refers to entrepreneurial behaviour inside established organisations (Kuratko & Morris, 2018). Focusing beyond venture creation is important as only few students start a company immediately after graduation but many can use entrepreneurial skills and mindset in CE (Harima et al., 2021; Killinberg et al., 2021) when starting their career in some established organisations (Kuratko & Morris, 2018). Therefore, such entrepreneurial skills and mindset need to be addressed and developed in EE (Ilonen, 2020).

Many scholars have agreed that to learn entrepreneurship, one must do entrepreneurship (Neck & Corbett, 2018; Neck et al., 2014). Consequently, practical orientations, such as practice-based approaches, learning-by-doing and experimentation have been introduced and applied in EE to provide real-life learning experiments for students (Hahn et al., 2017; Lackéus, 2013). A clash in academic and practical orientations and traditions makes higher education a complex context for learning entrepreneurship (Blenker et al., 2006; Delanty, 2003) as entrepreneurial, practice-based approaches are not considered to "fit" to traditional education (Pittaway & Thorpe, 2012).

Entrepreneurship teachers apply a variety of approaches to create favourable learning environment and pedagogies for EE (Ilonen, 2021). Similarly, research on science education has addressed how to support learners' engagement in authentic representations of scientific activity in classrooms (Bell et al., 2012; Lehrer & Schauble, 2006). Chakrin & Campbell (2022) explored epistemological framing which shapes the ways in which individuals process what is going on in a particular situation, as it relates to knowledge. Epistemological framing takes place when epistemological frames shape individuals' responses in a situation (Elby & Hammer, 2010). Chakrin and Campbell (2022) identified three related epistemological frames that science teachers exhibited during their teaching: 1) delivering knowledge, 2) guiding knowledge construction, and 3) making space for collaborative and iterative knowledge construction. Although their study enlightens how and in which situations the epistemological frames are activated and shape teachers' teaching it remains unclear how the frames may shape student's learning. EE is a particularly important and relevant context for studying framing in teaching and learning as it uses experimentation and learning-by-doing as approaches to enhance students'

learning in real-life setting which may contradict in traditional approaches used particularly in higher education (Solomon, 2008).

By building on epistemological frames, we aim to understand learning in CE and entrepreneurial behaviour in higher education. We ask: *How teachers' epistemological frames shape student learning in corporate entrepreneurship in a higher education setting?*

We found that different students rely on different frames and they may also move between the frames during the course as stimulated and suggested by different epistemological frames applied by the teachers in various assignments and exercises. Our study demonstrates that the students do not necessarily accept the frames suggested by the teachers and apply other frames accessible for them. In addition, institutional frame of university teaching and/or administration may guide student learning in addition to frames suggested by the teachers. The best performing teams were able to tackle or rather escape such institutional frames and used the CE movement as a space for their collaborative and iterative knowledge construction. Our study contributes to research on EE by introducing teachers' epistemological framing to students' learning. Furthermore, the study contributes to literature on epistemological framing as the topic has not been extensively studied in EE which is an interesting context given its experimental nature.

The paper is structured as follows. First, we provide theoretical background for our study discussing EE in enhancing CE and entrepreneurial behaviour as well as framing and epistemological frames in learning, particularly from the point of view of CE. Then we present the research methodology and data and move on to presenting and discussing our findings. Finally, we conclude by discussing the implications of our study for theory and practice as well as provide suggestions for further research.

Theoretical background

Entrepreneurship education in teaching corporate entrepreneurship

CE is considered of importance for corporate vitality and economic wealth creation (Dess et al., 2003). Its role in enhancing firm's efforts to explore new business opportunities and exploiting current competitive advantages has been widely acknowledged (Urbano et al., 2022). On the other hand, a lack of innovative and entrepreneurial action may lead to failure (Kuratko & Morris, 2018). CE involves the same process of entrepreneurship, i.e. pursuit of opportunities by individuals or groups of individuals in order to create wealth (Ireland et al., 2003) but it takes place within established organisations (see for example Corbett et al., 2013; Urbano et al., 2022).

Given the importance of CE for organizational and economic renewal and growth as well as numerous business students focusing on existing corporations for their initial positions after their graduation, it is justified to examine the domain of CE and how it is approached, taught and more importantly learnt in higher education (see Kuratko & Morris, 2018). Teaching and learning in CE faces similar types of challenges as EE in general, i.e. addressing the entrepreneurial process and how learning of an entrepreneur takes place (Wang & Chung, 2015). Entrepreneurs learn mainly by doing (Cope & Watts, 2000), acting and taking stocks of their behaviours (e.g. Corbett, 2005; Cope, 2011). Focusing on the entrepreneurial process of learning is particularly relevant when the aim is not only to spread knowledge about CE and the (managerial) ways in which CE can be supported in an organization, but also to educate students to behave entrepreneurially at their work and in their life. The question is not only to provide scientific knowledge about the CE, but more importantly to develop an entrepreneurial mindset of the students and foster entrepreneurial behaviour among them. How to encourage students to throw themselves to entrepreneurial process and, thus, make it possible for them to experiment entrepreneurial behaviour in a real-life setting? Applying practice-based approaches and learning-by-doing is particularly challenging in the context of higher education. Therefore, a more in-depth understanding is needed about the ways in which teachers engage their students to learn about CE and support their entrepreneurial behaviour, and how these efforts shape students' learning thereof.

Frames and framing

In order to understand how pedagogy and learning assignments might support students' learning on CE and entrepreneurial behaviour, this study builds on the concept of framing that is used to explain how individuals interpret and understand the world around them through the use of cognitive structures (frames) or frames of reference. At micro level frame is a knowledge structure that guides information processing of an individual (Benner & Tripsas, 2012; March & Simon, 1958). The studies mainly focus on priming effects or accessing

certain cognitive frames. 'Priming' refers to the activation of knowledge schema or a cognitive frame as a knowledge structure at the individual level. It needs to be differentiated from framing in which meanings are constructed and negotiated in and through processes of communication. Consequently, at meso level framing refers to the use of rhetorical devices in communication to support and minimize resistance to a change. (Cornelissen & Werner, 2014).

Framing has progressively expanded in social sciences after it was popularized by Goffman in 1970s. Goffman (1974, 38) suggests that "*we can hardly glance at anything without applying a framework, thereby forming conjectures as to what occurred before and expectations as to what is likely to happen now*". Framing has been used to encompass different linguistic, cognitive and cultural processes in a variety of organizational and institutional settings (Cornelissen & Werner, 2014). Recently, also in entrepreneurship research, there is a growing interest towards framing when attempting to understand how entrepreneurs construct meaning around novel endeavours in an effort to influence audience engagement (Cornelissen & Werner, 2014; Snihur et al., 2022). Framing has also been studied in the context of CE by focusing on how managers may apply different framing techniques when introducing CE initiatives to increase employee participation and to encourage them to behave entrepreneurially (Rigtering et al., 2019), for example. Their study show that different framing interventions may impact both participation in and quality of entrepreneurial behaviour and suggests, thus, that related field experimentations are important for understanding the ways in which CE and entrepreneurial behaviour among employees can be promoted by applying different framing techniques.

Teachers' epistemological frames

Framing is of particular importance in educational settings as it guides on one hand the ways in which students make sense of their learning and on the other hand how teachers instruct and guide the students. Through frames, students form a sense of what information and experience are relevant for conducting assignments and of what to expect of fellow students, educator, and themselves (Scherr & Hammer, 2007). Although frames help to make sense of events and situations, they are criticized to represent rigid data structures that are limiting in events that are out of the ordinary (Wilensky, 1986; Cornelissen & Werner, 2014). Relying on rigid frames can lead to failures particularly in novel and uncertain situations that require flexibility and alternative ways to approach issue at hand (Benner & Tripsas, 2012).

Hammer and Elby (2003) introduced a theoretical framework of teachers' epistemological framing for understanding how teachers and learners think about their experiences. Epistemological framing shapes the ways in which individuals process what is going on in a particular situation, as it relates to knowledge. Epistemological framing takes place when epistemological frames, i.e. a collection or sets of epistemological resources, shape individuals' responses in a situation (Elby & Hammer, 2010). In their study Chakrin and Campbell (2022) investigated the actions and instructional moves of preservice science teachers used during their early teaching episodes. They identified three clearly visible epistemological frames which were exhibited by the teachers.

First, *delivering knowledge -frame* relies on teachers delivering the curricular content to students via a more traditional delivery pedagogy (Stroupe & Windschitl, 2015) and transmission models of instruction (Davis, 1996), such as lecturing. Knowledge is understood as propagated, as disciplinary knowledge possessed by the teacher and to be distributed to learners who do not yet have the knowledge. Reasons for teachers to apply this frame may include positive experiences with delivery pedagogy in the past, need to provide information efficiently, and their uncertainty to move beyond lecture more. Although teachers applied this frame in providing information to student and students canonically accepting the ideas, teachers did not consider the frame to be well-aligned with theories of teaching and learning. (Chakrin & Campbell, 2022.)

Second, *guiding knowledge construction -frame* implies that teachers plan the ways in which they support students in constructing knowledge in specific ways in connection to standards documents. This frame is particularly relevant and unique to science education although not so to authentic scientific activity in which scientists engage. Knowledge is understood as canonically accepted and true or right by the scientific community. Teachers applied this frame according to their pre-planned instructions when they realized that students were stuck or went off track from targeted explanations and canonically correct answers. Teachers, thus, introduce ideas, but no explanations of real-world events and by doing so teachers support students in trying to apply the introduced ideas in meaningful ways. (Chakrin & Campbell, 2022). This frame allows teacher leaving space for students' own reasoning but still provides direct instruction on canonical correctness when needed to guide students' knowledge construction (Russ, 2018; Windschitl et al., 2018).

Third, *making space for collaborative and iterative knowledge construction* -frame relies on students collaboratively and iteratively constructing knowledge in the form of explanations or solutions to problems. Students connect their ideas with newly introduced ideas in a ways that are justified by evidence. Knowledge is understood as constructed in a collaborative, social process of students. In their study Chakrin and Campbell (2022) did not find a specific context in which this particular frame became activated by teachers. However, had teachers been exposed to strong practice-based framework during their studies in the particular context, may help teachers to apply this frame in their teaching. Finally, the identified frames are not exclusive and all frames can play a productive role in teaching and learning when the consequences of each frame are considered within the broader aims of instructional objectives. (Chakrin & Campbell, 2022.)

In our study we build on these three epistemological frames of teachers to understand learning in CE and entrepreneurial behaviour in higher education setting. Next we present the methodology of the study.

Methodology

This qualitative study reports the learning of university students in a bachelor's-level course on CE. It focuses empirically on a student cohort, who completed the course in 2023, altogether 84 students. The students were primarily from business disciplines, including a small number of engineering and exchange students. The students signed research permissions to allow utilization of all their course materials for the research purposes. The course focused on entrepreneurial behaviour in existing organizations (Antoncic & Hisrich, 2003; Åmo & Kolvereid, 2018). The students participated in reading clubs in their teams based on which their task was to accomplish a team exercise "corporate entrepreneurship movement". The reading materials provided understanding of CE and entrepreneurial behaviour as a way of doing things differently, its antecedents and outcomes. Such framing was done to guide and stimulate students' thinking and ideation (cf. guiding knowledge construction). The concrete task given to student groups was to jointly create awareness about the recently established Entrepreneurial Hub of the University and execute a real-life movement around it in an entrepreneurial way. This was done to expose the students to entrepreneurial behavior in a real-life setting and by doing so giving them space for collaborative and iterative knowledge construction on entrepreneurial behaviour. The teachers did not otherwise guide or co-ordinate the task and refrained, thus, from delivering knowledge to the students. The outcomes of organizing the CE movement were presented in a fair in the end of the course to further enhance collaborative knowledge construction between the student teams. In the fair, the students voted for the team, which was able to create the most entrepreneurial "corporate entrepreneurship movement".

The research material is comprised of individual learning reflections and team reports of the students who belonged either to the winning team (4 students), to the team that received lowest outcome in the team exercise (3 students), received highest (2 students) or lowest grades (3 students) based on their individual learning reflections. With such a selection we focus on the best and worst performers both in terms of individual learning and team performance. By doing so we acknowledge that learning in EE is an individual learning experience taking place in and being shaped by the team (see Steira & Steinmo, 2021). This study also relies on students' self-reporting, as we used their reflective learning diaries (10–15 pages each, or 10–15 minutes each video or podcast if recorded) as research material as well as team exercise reports (1–2 pages each) of informant's team. In total, we have 12 informants from 6 teams. Table 1. informs about the students, their team and selection criteria.

Table 1. Informants of the study

Student	Team	Selection criteria
Oliver	Beta	Lowest outcome in the movement/team exercise
Rachel	Beta	Lowest outcome in the movement/team exercise
Tiffany	Beta	Lowest outcome in the movement/team exercise
Liam	Gamma	Highest grades in the individual learning reflection
Roxanne	Delta	Highest grades in the individual learning reflection
Ruth	Epsilon	Lowest grades in the individual learning reflection
Alice	Mu	Lowest grades in the individual learning reflection
Sabrina	Mu	Lowest grades in the individual learning reflection
Emily	Alpha	Winning team of the movement/team exercise
Ian	Alpha	Winning team of the movement/team exercise
Sarah	Alpha	Winning team of the movement/team exercise
Sophie	Alpha	Winning team of the movement/team exercise

The analysis of our research material was carried out in stages, drawing on the steps of thematic analysis set out by Braun and Clarke (2006). First, the learning reflections and team exercise reports were read/listened through, and initial remarks were made. Second, the text/video sections were identified where the students reflected upon their learning and reaction to the course contents and related pedagogies applied and provided by the teachers. Research materials were categorised according to the three epistemological frames identified: delivering knowledge -frame, guiding knowledge construction -frame and making space for collaborative and iterative knowledge construction -frame based on Chakrin and Campbell (2022). The findings thereof are discussed next.

Results

Delivering knowledge -frame

The guiding teaching philosophy of the course is that the teachers refrain from transferring knowledge to the student. In the beginning of the course the teachers presented the learning goals of the course, the course structure, and instructed the aim of the team exercise. The concept of CE was briefly introduced but students were requested to gain further understanding thereof by familiarizing themselves with the reading club materials and having joint discussion thereof. Traditional, teacher-centered approach was, thus, not used in the course, meaning that the students were expected to take an active role in their learning process. In students' minds this seemed to contradict with traditional university teaching, and it caused confusion and even some anxiety among the students. Interestingly, negative feelings were provoked among the students who received highest as well as lowest evaluations. These emotions guided students to use different approaches to the team exercise.

For instance, Sophie, a student who was a member in a winning team, explained that:

"In the beginning of this course, I thought I wasn't innovative enough and found the team exercise very difficult."

Rachel, a student from a team with lowest outcomes from the team exercise, discussed that they did not even think of the possible ideas by themselves as it was so challenging but did go straight to ask "the right answer" from the hub-manager.

"We struggled with coming up with an idea. We thought that it would be the most productive way to approach the task to go to the hub and ask from its manager what they would like to have."

Also, Sabrina, a student who received one of the lowest grades of the learning reflection, and her team, decided to proceed with their team exercise by approaching the hub manager in the hopes of innovative ideas to be executed.

"The contact person from the Hub tried to give us innovative ideas to execute but these were unfortunately way too hard as they were tasks that would have required coding games which is something that as a business student none of us knew how to do."

Oliver, a student who received one of the lowest evaluations of the learning reflection and were part of the team, which received the lowest outcome in the team exercise, had a challenge to get a hold of the course and the topics without traditional lectures guiding his way:

"I wish I had more background information on this topic before I have read this article, that way I might have taken more from that reading club. There were not many learnings from the article unfortunately, neither did our teamwork benefit from it. I found it hard to link this with the existing knowledge in entrepreneurship or intrapreneurship."

All this demonstrates students' uncertainty about the ideas and execution without extra resources. Furthermore, this suggests that students are accustomed to plan and write plans and strategies in university courses whereas they are not used to be required to implement them. An idea of practicing entrepreneurial behavior or CE was considered strange even though the teachers highlighted the importance of acting. However, this type of pedagogy including self-regulation and actions was not considered always purely negative as Sarah describes:

"Considering the teamwork, our teachers didn't give many instructions from the idea generation to implementation. They gave freedom for students to use their entrepreneurial mindset to generate creative ideas execute innovative awareness campaign. For me, if our teachers would

have given tips to awareness program, I don't think I could able to think beyond that. Therefore, providing freedom helps students to utilize their skills and hidden talents to be more innovative."

She thought that specific instructions would have restricted the learning process and thinking already from the beginning of the course, and no innovative solutions would have emerged. Hence, she understood that traditional, teacher-centered approach would not have worked in this type of EE course.

Although teachers consciously avoided applying the delivering knowledge -frame in their teaching or applied it only very thinly by providing course instructions, some student clearly expected teachers to just deliver more knowledge for them to learn. However, the teachers step backwards and pushed students to familiarize themselves with the knowledge on CE and entrepreneurial behavior provided for the reading clubs. This caused confusion and even negative emotions among some students and shaped their learning as well as ideation and execution of a team exercise.

Guiding knowledge construction -frame

Teachers of the course guided knowledge construction by setting the students into teams whom had a task to have three reading club sessions by themselves. The aim of the reading clubs was to provide the students with knowledge on CE and entrepreneurial behaviour but also to facilitate CE movement, i.e. the team exercise.

The students, clearly, utilized the reading clubs differently. The students, who received high marks from their individual learning reflection, clearly pondered topics together and analysed and reassembled reading material in a mature way. For instance, Ian discusses:

"In a reading club, as a team, we came up with these three key drivers of corporate entrepreneurship: company structure that enables corporate entrepreneurship, entrepreneurial company values and entrepreneurial aptitude in employees".

Some of the students, who received high marks from the learning reflection, were able to nicely ponder the articles in a relation to their team exercise and ideas for the CE movement started to emerge already from the first reading club. However, this seemed to require putting extra effort to further familiarize oneself with the topic and searching for extra readings thereof. Sarah describes the process:

"During this reading club, our team members shared about their thoughts on question by referring extra materials, because we thought that given materials do not contain much information about the question. At this reading club 1, we started brainstorming process to generate a creative idea about how to do the awareness campaign."

In addition to the joined knowledge construction, some of the students took it even further and continued to ponder the topics at home after the reading club. The learning reflection guided this type of behaviour. For instance, Sophie shares that:

"One interesting topic that we discussed, was that we have noticed that we like our work more if we have given a possibility from employer to do the work in the way we feel it can be done best. For example, a cleaner who can do the cleaning work in the way that they feel is most efficient. I think intrapreneurship can for that reason also be that you as an employee can do the work the way you want to."

However, some students got stuck in to the course pedagogy and as the teachers were not taking part to the reading clubs by telling "the right answers" they had hard time to connect the articles and the topics to the team exercise. Neither the articles gave "the right, concrete answers" or "a recipe" what to do in a team exercise. Oliver points out:

"Unfortunately, neither of the articles helped much with the teamwork, other than encouraged us to think a little bit more innovative."

It is also interesting, that particularly the students in the low performance teams experienced difficulties to operate as a team although the reading clubs were considered as an interesting experience. Again, these students clearly expected the teachers to provide more exact information and knowledge to guide their exercise and learning. Alice shares that:

"All the reading clubs were quite interesting experiences, firstly even though it was an assignment, I thought it was something quite open ended, so I found quite hard to engage with my other team mates about fulfilling all the requirements."

Students' team reports further demonstrated how some students were expecting a confirmation from the teachers or hub-manager of their initiative before starting to execute the idea. In a way they wanted some third party to accept their initiative as the team report of the Team Gamma points out:

"[a team member] soon reached out to the Hub manager to introduce our idea and as soon as we got the green light we started to plan the execution." (Team Gamma)

This suggests that it was not easy for students to openly ideate the movement and particularly start its execution before they were sure that they were on the right track or that their initiative provided good enough a solution to the challenge. We as teachers wanted to step back and push the students to make their own decisions, and thus to encourage them to trust on the process. However, the hub-manager who was not a teacher himself, followed a more traditional pedagogical approach, perhaps unknowingly, and wanted to provide the pondering students with the "right answers". Therefore, some more unsecure students wanted to lean on his opinion.

Another team ideated several ways to raise awareness of the Hub. They executed a TikTok video, designed flyers and made posts in several social media channels. They likely invested heavily on related activities, and considered critically that they could have done even more to reach out the wider audience:

"Our execution was successful as everything went just as planned... but we could have made a bigger campaign." (Team Delta)

According, as group they did not perform very well despite all their efforts as they did more or less the same in comparison to most of the other groups. As an individual learner Roxanne reflected her learning thereof:

"We did our best and focused on the visuals in our campaign. However, our campaign was not unique, it did not stand out. I would argue that our campaign was somewhere in between of being innovative and noninnovative."

Roxanne realized in her reflection that although they executed their exercise well and did a lot for the movement, it was not good enough to be innovative and show up from the other movements. Roxanne as an individual student scored high in her learning reflection as she had learnt by experience what it implies to be entrepreneurial and was able to reflect their performance and learning based on the knowledge constructed during the course.

Making space for collaborative and iterative knowledge construction -frame

The main emphasis of the course was to push the students to collaboratively learn from the readings and apply the knowledge constructed thereof in their team exercise which was to provide them a possibility to apply their learning in a real-life setting. By providing the students a somewhat safe space to 'taste' entrepreneurial behaviour in ideating and executing the CE movement, the teachers relied on the collaborative and iterative knowledge construction frame.

Students' individual learning reflections showed that they approached the team exercise differently. Some of the students were excited all the way from the beginning and were willing to do their best to compete against the other teams. For instance, Sarah describes that:

"At the beginning, they [the teachers] said that they were going to award the price for the best team. This cause to motivate students and increase their productivity and thus they put their maximum effort to create innovative campaign."

Her team mate Sophie told in her learning reflection how they put remarkable effort to the task and how they as a team turned negative into something positive:

"We wanted more innovative way to really reach students. We had other ideas which seemed great, for example organizing entrepreneurial events at Hub, but many these ideas would have required resources which we didn't have, and their organization would have taken too much time."

Also, students' team reports show that those teams that came up with a more innovative idea, reported having used some time at the beginning for joint brainstorming of different ideas in a group. They listed several optional ideas with which they had started but eventually decided to do something else which they considered to be more unique and differentiate their "movement" from others. The winning team, indeed, refers to "movement" indicating that they wanted to see something happening based on their idea and intervention. Furthermore,

the teams with more innovative or different types of ideas in comparison to the mainstream of social media campaigns, genuinely wanted to show up and do something different:

"We also found that other groups were also making videos so we wanted to come up with something else." (Team Alpha)

"We had many different ideas on how we could market the Hub... our innovative part in this campaign was to do something different than other teams, and this is why we decided to go to the [other campus]..." (Team Mu)

Similarly, another team positioned themselves against other teams, their 'competitors', in ideating their exercise as well highlighted the value added created for the hub:

"When tackling this exercise, the biggest struggle that the team was facing was to come up with something that would set us apart from all the other teams while still bringing tangible value to the Hub..." (Team Gamma)

However, some of the students struggled with creating something innovative as they seemed to get stuck into the inconveniences that made their first idea impossible. As some of the students were looking for a confirmation to their idea, they turned to the hub-manager. Oliver describes that in the end of the process he realised that the hub-manager was the bottle neck for them to execute an innovative idea, while Sophie says that when creating something innovative, one must trust on the teachers' frames and neglect university bureaucracy as it kills innovative activities:

"I do not believe that our project was innovative. But neither do I believe that the exercise itself encouraged innovativeness, since the needs of the Hub were clearly stated and many of the ideas were put down in the beginning by its manager."

"I think that the University allows people to be creative in certain level with entrepreneurship courses, but often it is also very bureaucratic which can easily extinguish the innovative acts that are starting. This was seen with our team exercise as many groups would have wanted to utilize different platforms at the university, but these were often shut down."

Some of the students had realized that during the course and particularly in the execution of the movement, they confronted several types of frames they tried to please. Oliver points out:

"We did not understand fully whom we are doing the project for, the Hub or the course. So, there were two separate "managers" that we tried to please. One was encouraging innovations as much as possible, while the other was focused on more standard things."

In comparison to other teams, the winning team clearly benefitted from identifying and using the strengths of the team members. The complementary of their skills, competences and behaviours was visible in the individual learning reflections as they further discussed how they learned from their team mates and enjoyed the process. Sophie describes that:

"One of our group members is an entrepreneur with an own company and he was very innovative while brainstorming. It was very interesting to have an entrepreneur in our group and he taught me a lot about how to be innovative and believe in own ideas. One of our members was an exchange student from a different culture as well as different major from the rest of us which gave a different perspective to our task."

Emily, on the other hand, points out that course and learning from the team members allowed her to change her mindset and behaviour:

"Entrepreneurship has offered a lot of things to my life. As an introvert character, I was lack with self-confidence during group works. Earlier, I was reluctant to express my ideas in group works. But entrepreneurship has helped me to overcome from my weaknesses. Now I am used to express my ideas and to share my knowledge in group works. In most cases I used to escape from risks. Now, I really like to do innovations."

Successful team work throughout the team exercise were needed to come up with an innovative idea and an execution. Those studied teams whose team performance was not rated high planned but not executed nice projects: came up with a joint idea, divided the execution and reporting as taught in a variety of courses highlighting the plan-execution-assessment-cycle of a well-managed project. However, the innovative element as well as collaborative learning remained vague likely due to them working individually and separately.

"We divided the roles after we had ideated the project we wanted to do. In the beginning everyone was part of the ideation process. In the end everyone contributed to the project report."
(Team Beta)

Furthermore, as their plan never reached the actual execution, namely launching of the website, the initiative remained rather at the planning stage and no impact thereof could be assessed in terms of raising awareness of the Entrepreneurial Hub: *"The website has not been launched, so we cannot measure the traffic."* Following scarce instructions and perhaps even making considerable effort on planning the initiative, does not necessarily make a difference if the actual 'movement' does not take place after all. This highlights the role of doing and action, in addition to ideation and planning, in EE to accomplish something (see Kassean et al., 2015).

Interplay of the frames

Based on the studied individual learning reflections of the students and teams' team reports, the students worked with several competing frames during the course. To start with they did not necessarily accept to apply the frames provided by the teachers. Teachers did not lean on traditional university approach and, thus, attempted to apply more constructivist frames which were hard for some students to accept as they were used to different type of frames during their university studies. These students expected the teachers to simply transfer the knowledge to them and they could not see the point of reading clubs or the team exercise to start with. These students wanted to rely on their pre-existing frame and understanding of university teaching and courses with clear instructions and writing plans (not acting themselves in executing the plan) and knowledge as propagated.

The CE movement, i.e. the team exercise, challenged the students to get rid of their pre-existing frames and pushed them towards a joint knowledge construction. While the teachers stepped back and refused to judge the ongoing process and provide clear responses to students' concerns about the "validity of their idea", for example, some students decided to lean on the Hub manager, who was willing to provide "the right" answers and solutions for the students and some students considered this being more "productive" than relying on the frames of the teachers. The students, thus, created the frame of someone delivering the needed knowledge for them although the teachers consciously avoided applying such frame. For some students the solutions given posed a threshold as they felt they had not the competence needed to execute it. For some students the reading clubs and hub manager's consultancy served, however, as guidance for construction new knowledge on CE and entrepreneurial behaviour as well as for ideating and executing the team exercise, the CE movement. In the end, these students realized that the hub-manager's consultancy prevented them to create anything innovative. In a similar manner, the hub manager and university administration expected the teachers to apply a more traditional university teaching model with clear pre-set instructions and proper co-ordination between the student groups. University administration complained about the students approaching them and asking silly questions whereas the hub manager blamed the teachers on not co-ordinating at all students' initiatives in terms of suggesting different ideas of different groups, for example.

Particularly the performance of the winning team reveals that it is possible for the students to learn on CE and entrepreneurial behaviour through collaborative and iterative knowledge construction. By identifying their complementary capabilities and searching for an idea which genuinely differed from other teams' ideas they managed to come up with an innovative CE movement. Interestingly, the execution of their movement was quite simple, just an approachable, spoken language discussion via Jodel (social media) among the target group (students of the university) which did not require much effort to execute after they came up with the idea. On the other hand, another group which invested great effort and time in executing several related activities, realized that although they worked hard together in executing their ideas, they were not able to attract the audience innovatively. In both teams some students realized this and reflected upon their learning from the team exercise and finally also of the wrap-up session, the fairs, where all the groups presented their movements and outcomes. The reflections demonstrated learning of the CE and entrepreneurial behaviour and some of them even considered having experimented it. Emily from the winning team admits her surprise and learning which demonstrates that it is possible to perform well without extreme effort if one has an innovative idea:

"At the time we selected Jodel as the platform of our awareness program, one of my group members and I felt uncertainty about that idea, because we needed to do a little task for executing our movement. When compared with other groups we did not put much effort for this task."

Furthermore, the students also faced institutional frames of the university administration which did not unconditionally accept their ideas to be implemented. Perhaps students were a bit naïve as they thought that university communication, for example, would immediately let students to design a website for the entrepreneurial hub or create social media accounts for the hub just for the course. Students felt disappointed as their justified ideas did not become executed by administration or as they were not given permission to do it by themselves on behalf of the university. The best performing teams were able to initiate ideas that did not require university resources to be executed but rather relied on students' innovations and execution, i.e. their own CE movement. Finally, the learning reflections of the students from the winning team and other well performing teams demonstrate that these students were able to benefit from the course much more than the students with mediocre ideas. This suggests the power of joint and iterative knowledge construction.

Discussion and conclusion

Our study was to gain more in-depth understanding on learning in CE and entrepreneurial behaviour in higher education, and we asked: *How teachers' epistemological frames shape student learning in corporate entrepreneurship in a higher education setting?* Our study contributes to research on EE by introducing teachers' epistemological framing to student learning in EE. Furthermore, the study contributes to literature on teachers' epistemological framing as the topic has not been extensively studied in EE which is an interesting context given its experimental nature.

Our study demonstrates how different students rely on different frames and how they may also move between the frames during the course as stimulated and suggested by different epistemological frames applied by the teachers in various assignments and exercises. However, the students did not necessarily accept the frames suggested by the teachers. Some students expected a more traditional university teaching and learning approach, delivering knowledge -framework, which was not applied by the teachers at all and therefore students felt anxious and uncomfortable to start with. These students faced and reported high emotional triggering and confusion which may have lead them to the disengagement to the team exercise and learning in general in this type of experiential learning (see Crosina et al., in Press). Given this, such disengagement likely had implications to the team dynamics. From the point of view of learning it would be important to understand how students find ways back from the disengagement zone further engage to the learning process. This opens up new and interesting avenues for future research. Furthermore, our study highlights only some reactions of the students to the teachers' epistemological frames as well as their reflections of the related learning experiences. Further research could also be devoted to gaining more fine-grained knowledge of the learning outcomes particularly as well as on the pre-existing frames of the students, which shape their learning irrespective of and parallel with the teachers' epistemological frames.

Some students were able to accept at least partly and learn on CE and entrepreneurial behaviour via a more constructive approach in knowledge creation applied by the teachers. Related learning experiences were reported based on the reading clubs relying on teachers' frame of guiding knowledge construction and on CE movement pushing students to collaborative and iterative knowledge construction that produced seemingly the most successful outcomes in the studied experiential course. Our findings complement findings of Steira and Steinmo (2021) on the importance of team collaboration and teamwork to persevere through the possible challenges in venture creation. Although their study focused on the process of venture creation, the findings are equally relevant in the CE setting given the similar nature of the entrepreneurial process (see Corbett et al., 2013). Our study suggests that creating and maintaining sound team dynamics in the students groups seems supportive to learning. If the students cannot work innovatively in their teams, they remain executing the course exercise and passing the course independently rather than developing the ideas together and enjoying, thus, possibilities for collaborative and iterative knowledge construction.

Importantly the interplay between the teachers' epistemological frames was visible in students' individual learning reflections and team reports as well as the ways in which students either accepted and accommodated with or denied them. Interestingly, institutional frames of university administration also challenged student learning and moving between the frames. Such frames challenged also us as teachers and facilitators of learning. The best performing teams were able to tackle or rather escape such institutional frames by ideating a CE movement, which was in their own hands and did not require institutional support. Higher education institutional frames here represented traditional top-down approach where knowledge was instructed to the learners rather than constructed by learners (see Lourenço & Jones, 2006). How to integrate competing frames of teachers and stakeholders in entrepreneurship education is another promising future research direction. Such frames likely shape not only student learning but also teachers' approaches to their teaching, i.e. their choice of the epistemological frames to be applied. Given the interplay of frames in student learning, the future

research could also provide in-depth knowledge on supporting student teams moving between the frames. This is highly important as different students learn in different ways.

Our study has clear message for educators. It is worthwhile considering one's own epistemological frames for each course and intervention. However, as the study demonstrates teacher's frames do not necessarily become accepted among the students or they are interpreted differently. Therefore, it is important for a teacher to be prepared for such situations by e.g. highlighting the learning goals and structure of the course and the role of a chosen teaching approach to support the learning targets. On the other hand, students also learn differently and therefore it is recommended to provide different frames during different phases of the course if possible to provide different types of learning opportunities for students. Finally, our recommendation for the students is to be open although critical about a variety of teacher's approaches in EE. To be impactful, EE oftentimes requires experimental learning which may cause anxiety among the students, stakeholders and even teachers themselves. However, learning takes place in the process and one needs to dare to throw oneself into it to be able to gain learning experiences thereof. We wish that our experiments in EE and this explorative study inspires EE teachers to reflect upon their epistemological frames and study the related consequences.

References

- Antonicic, B. and Hisrich, R.D. (2003) Clarifying the intrapreneurship concept, *Journal of Small Business and Enterprise Development*, 10(1), 7–24.
- Bell, P., Bricker, L., Tzou, C., Lee, T. and Van Horne, K. (2012) Exploring the science framework: Engaging learners in scientific practices related to obtaining, evaluating, and communicating information, *Science Scope* 36(3), 17-22.
- Benner, M.J. and Tripsas, M. (2012) The influence of prior industry affiliation on framing in nascent industries: The evolution of digital cameras, *Strategic Management Journal*, 33, 277-302.
- Blenker, P., Dreisler, P., & Kjeldsen, J. (2006) *Entrepreneurship education: the new challenge facing the universities*. Department of Management, Aarhus School of Business.
- Chakrin, J. and Campbell, T. (2022) Preservice science teachers' epistemological framing in their early teaching, *Journal of the Learning Sciences*, 31(4-5), 545-593.
- Cope, J. (2011) Entrepreneurial learning from failure: An interpretative phenomenological analysis, *Journal of Business Venturing*, 26(6), 604-623.
- Cope, J. and Watts, G. (2000) Learning by doing: An exploration of experience, critical incidents and reflection in entrepreneurial learning, *International Journal of Entrepreneurial Behaviour and Research*, 6(3), 104-124.
- Corbett, A.C. (2005) Experiential learning with the process of opportunity identification and exploitation, *Entrepreneurship Theory and Practice*, 29(4), 473-491.
- Corbett, A.D., Covin, J.G., O'Connor, G.C. and Tucci, C.L. (2013) Corporate entrepreneurship: state-of-the-art research and a future research agenda, *Journal of Product Innovation Management*, 30(5), 812-820.
- Cornelissen, J.P. and Werner, M.D. (2014) Putting Framing in Perspective: A Review of Framing and Frame Analysis across the Management and Organizational Literature, *The Academy of Management Annals*, 8(1), 181-235.
- Crosina, E., Frey, E., Corbett, A. and Greenberg, D. (in Press) From Negative Emotions to Entrepreneurial Mindset: A Model of Learning through Experiential Entrepreneurship Education. Academy of Management Learning & Education.
- Delanty, G. (2003) Ideologies of the knowledge society and the cultural contradictions of higher education. *Policy Futures in Education*, 1(1), 71-82.
- Dess, G.G., Ireland, R.D., Zahra, S.A., Floyd, S.W., Janney, J.J., and Lane, P.J. (2003). Emerging issues in corporate entrepreneurship, *Journal of Management*, 29(3), 351–378.
- Elby, A. and Hammer, D. (2010) Epistemological resources and framing: A cognitive framework for helping teachers interpret and respond to their students' epistemologies. In L.D. Bendixen & F.C. Feucht (Eds.) *Personal epistemology in the classroom: Theory, research, and implications for practice*: 409-434, Cambridge University Press.
- Goffman, E. (1974) *Frame analysis: An essay on the organization of experience*. Boston MA: North Eastern University Press.
- Hahn, D., Minola, T., Van Gils, A., & Huybrechts, J. (2017) Entrepreneurial education and learning at universities: exploring multilevel contingencies. *Entrepreneurship & Regional Development*, 29(9-10), 945-974.

- Hammer, D.M. and Elby, A. (2003) Tapping epistemological resources for learning physics, *Journal of the Learning Sciences*, 12(1), 53-90.
- Harima, A., Gießelmann, J., Götsch, V., & Schlichting, L. (2021) Entrepreneurship? Let us do it later: procrastination in the intention–behavior gap of student entrepreneurship. *International Journal of Entrepreneurial Behavior & Research*, 27(5), 1189-1213.
- Ilonen, S. (2020) *Entrepreneurial learning in entrepreneurial education in higher education*. Turun yliopiston julkaisu – Annales Universitatis Turkuensis, Sarja – Ser. E Osa – Tom. 54 Oeconomica, PAINOSALAMA: Turku.
- Ilonen, S. (2021). Creating an entrepreneurial learning environment for entrepreneurship education in HE: The educator's perspective. *Industry and Higher Education*, 35(4), 518-530.
- Ireland, R.D., Hitt, M.A. and Sermon, D.G. (2003) A model of strategic entrepreneurship: The construct and its dimensions, *Journal of Management*, 29(6), 963-989.
- Kassean, H., Vanevenhoven, J., Liguori, E., & Winkel, D. E. (2015) Entrepreneurship education: a need for reflection, real-world experience and action. *International Journal of Entrepreneurial Behavior & Research*, 21(5), 690-708.
- Killingberg, N. M., Kubberød, E., & Blenker, P. (2021) Preparing for a future career through entrepreneurship education: Towards a research agenda. *Industry and Higher Education*, 35(6), 713-724.
- Kuratko, D.F. and Morris, M.H. (2018) Corporate Entrepreneurship: A Critical Challenge for Educators and Reserachrs, *Entrepreneurship Education and Pedagogy*, 1(1), 42-60.
- Lackéus, M. (2013) Developing entrepreneurial competencies. *An action-based approach and classification in entrepreneurial education*, Chalmers University of Technology, Gothenburg.
- Lehrer R. and Schauble, L. (2006) Scientific thinking and scientific literacy. In K.A. Renninger & I.E. Siegel (Eds.) *Handbook of child psychology*, vol 4, 153-196, Wiley.
- Lourenço, F., & Jones, O. (2006) Developing entrepreneurship education: comparing traditional and alternative teaching approaches. *International Journal of Entrepreneurship Education*, 4(1), 111-140.
- March, J.C. and Simon, H.A. (1958) *Organisations*. New York: Wiley.
- Neck, H.M. and Corbett, A.D. (2018) The scholarship of teaching and learning entrepreneurship, *Entrepreneurship Education and Pedagogy*, 1(1), 8-41.
- Neck, H. M., Greene, O. G., & Brush, C. G. (2014). Practice-based entrepreneurship education using actionable theory. *Annals of Entrepreneurship Education and Pedagogy* 2014, 1.
- Pittaway, L. and Thorpe, R. (2012) A framework for entrepreneurial learning: A tribute to Jason Cope, *Entrepreneurship & Regional Development*, 24(9-10), 837-859.
- Rigtering, J.P.C., Weitzel, G.U. and Muehlfeld, K. (2019) Increasing quantity without compromising quality: How managerial framing affects intrapreneurship, *Journal of Business Venturing*, 34, 224-241.
- Russ, R.S. (2018) Chracterizing teacher attention to student thinking: A role for epistemological messages, *Journal of Research in Science Teaching*, 55(1), 94-120.
- Scherr, R.E. and Hammer, D (2009) Student behavior and epistemological framing: Examples from collaborative active-learning activities in physics, *Cognition and Instruction*, 27(2), 147-174.
- Snihur, Y., Thomas, L.D.W., Garud, R. and Phillips, N. (2022) Entrepreneurial Framing: A Literature Review and Future Research Directions, *Entrepreneurship Theory and Practice*, 46(3), 578-606.
- Steira, I. M., & Steinmo, M. (2021) The development of effective new venture teams in venture creation programmes. *International Journal of Entrepreneurial Behavior & Research*, 27(5), 1116-1141.
- Stroupe, D. and Windschitl, M. (2015) Supporting ambitious instruction by beginning teachers with specialized tools and practices. In J. Luft & S. Dubois (Eds.) *Newly hired teachers of science: A better beginning*, 181-196, Sense Publishers.
- Thomassen, M. L., Williams Middleton, K., Ramsgaard, M. B., Neergaard, H., & Warren, L. (2020) Conceptualizing context in entrepreneurship education: a literature review. *International Journal of Entrepreneurial Behavior & Research*, 26(5), 863-886.
- Urbano D., Turro, A., Wright, M. and Zahra, S. (2022) Corporate entrepreneurship: a systematic literature review and future research agenda, *Small Business Economics*, 59, 1541-1565.
- Wang, C.L. and Chung, H. (2015) Entrepreneurial learning in D. Rae & C. Wang (Eds.) *Entrepreneurial learning: New perspectives in research, education and practice*: 11-44. New York, NY: Routledge.
- Wilensky, R. (1986) Points: A theory of the structure of stories in memory. In B. Grosz, K. Jones & B. Webber (Eds.) *Readings in natural language processing*, 459-473, Los Altos, CA: Morgan Kaufmann.
- Windschitl, M. Thompson, J. and Braaten, M. (2018) *Ambitious science teaching*. Harvard Education Press.
- Åmo, B.W. and Kolvereid, L. (2018) Corporate entrepreneurship, in R. Blackburn, D. De Clercq and J. Heinonen (Eds.), *The SAGE Handbook of Small Business and Entrepreneurship*, 259–278, London: Sage.