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STUDENTS' ENTREPRENEURSHIP COMPETENCE DEVELOPMENT DURING ENTREPRENEURSHIP EDUCATION

Master's thesis

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I hereby declare that I have compiled the thesis independently and all works, important standpoints and data by other authors have been properly referenced and the same paper has not been previously presented for grading.
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ABSTRACT

This thesis explores the efficacy of higher education as a suitable environment for students' entrepreneurship competence development. The study includes a sample of 1087 participants, enrolled at various levels of education. The participants participated in a controlled study that was supervised by the faculty of Tallinn University of Technology to evaluate student perceptions about entrepreneurship competence sub-competencies. By recording the responses before and after the study, the data allowed for an analysis of the influence of entrepreneurship education on students' assessments of entrepreneurship competence deveopent during EE.

The study adopts a descriptive approach to evaluate the efficacy of entrepreneurship education in higher education and applies statistical quantitative analysis to derive the results. The results are indicative of a positive influence of entrepreneurship education in higher education and back up the environment imparted by higher education as effective and suitable for students' entrepreneurship competence development.

Keywords: Entrepreneurship education, higher education, entrepreneurship competence, competence development

INTRODUCTION

Entrepreneurship education (EE) has gained immense popularity in the last few decades (Wei *et al.* 2019). Owing to the ever-increasing globalization and the need for innovative solutions, there is an increased pressure to come up with new solutions, new approaches, and new products to fulfill the gaps in the market and contribute to the global economy (Komarkova *et al.* 2015). Entrepreneurship education is greatly concerned with fostering creative skills and cultivating innovative talents with practical value (Wei *et al.* 2019). Entrepreneurship education is one of the major driving forces of future development, and at present, the innovative and development strategies pose new demands for EE (*Ibid*.). It is important to evaluate the environment provided by higher education and see if it is appropriate and suitable for the development of students' entrepreneurship competence (Akhmetshin *et al.* 2019). Hence the research study will proceed to assess if entrepreneurship education in higher education is a suitable environment for students' entrepreneurship competence development.

Most of the current and ongoing research in this field focuses on teaching and constructing an ecosystem where the curriculum aligns with entrepreneurship education and intentions (Wei *et al*. 2019). As the world becomes more progressive, the need for entrepreneurship is higher than ever (Amadi 2020). It calls for entrepreneurship education to provide the students with the right channels and resources and guide them towards their entrepreneurship competence development (Komarkova *et al.* 2015). Building an ecosystem of multiple levels via diverse knowledge and value systems is significant and a need of the hour (Järvi *et al*. 2018). The education experience concerning entrepreneurship is in its infancy stages in many countries (Ustyuzhina 2019). There is an increased focus on entrepreneurship education in the current scientific literature, specifically with reference to personal development (Ndofirepi 2020) critical thinking (Ghafar 2020), problem-solving (Kim *et al.* 2018, 4), and creativity (Yar *et al.* 2008).

Higher education successfully imparts the knowledge and skills necessary for an individual to excel in practical life (Ghina *et al.* 2017). However, given the rising number of enrollments in college and higher education, there are not enough individuals ready to call themselves

entrepreneurs, nor are they ready to dive into entrepreneurship-related activities (*Ibid.*). While higher education imparts the environment that exposes students to entrepreneurial spirit and culture to create intellectual entrepreneurs, it is still uncertain if the higher education environment is suitable for competence development (Paltasingh 2012).

The research problem is a lack of evidence that supports if higher education is suitable for entrepreneurship competence development, which calls for an evaluation higher education environment to be able to comment on students' competence development (Ferreras-Garcia *et al.* 2021).

Modern entrepreneurship education still lacks the necessary framework to teach and equip students with the skills that would ensure successful endeavors in their entrepreneurial journey (Ustyuzhina *et al.* 2019). While there is an increased focus, and inclination towards entrepreneurship, students fail to showcase the necessary skills (Wei *et al.* 2019). EE's theory and practice are still being researched, and numerous higher education programs have launched specific and tailored EE programs, providing the students with space and practical opportunities to develop their skills, ideas, and products before entering the market (*Ibid.*).

To evaluate if the higher education environment is effective, and sufficient for student's entrepreneurship competence development, this research aims to identify the impact of explicit learning experiences in higher education, and will proceed to achieve the following research objectives:

I) Identify and recognize the components which shape the entrepreneurship competence of a student.

II) Evaluate how entrepreneurship education shapes student assessments about entrepreneurship competence.

III) Analyze if explicit learning experience has any impact on student assessments toward entrepreneurship competence

For this, the study will attempt to answer the following research questions:

i) Does entrepreneurship education have an influence on students' assessments of entrepreneurship competence?

ii) How does the self-management and other entrepreneurship competencies relate?

iii) How do explicit learning experiences contribute to student assessments about entrepreneurship competence?

The expected outcomes of this research are a contribution to the research in entrepreneurship competence, specifically within the context of entrepreneurship education. Moreover, the author believes that this research study will add to the existing literature and highlight universities and higher education institutes can inculcate and foster the development of entrepreneurship competence.

The author begins by providing the reader with an introduction to the research topic, research objectives, and the posited research questions. The introduction lays out the research problem, research questions, objectives, and structure of this thesis. This thesis comprises four chapters where Chapter 1 presents the theoretical framework for this thesis, to better understand the context of this research study. Chapter 2 presents the selected approach and research methodology as applied in this study. Chapter 3 presents the results achieved and analysis of the data at hand. Chapter 4 presents the overall findings of this study and concludes by summarizing the study and achievements.

1. LITERATURE REVIEW

This chapter serves as the theoretical framework for this thesis. The author will present a literature review to provide the reader with the necessary knowledge to grasp the ideas as we move forward with this study.

The concept and genesis of entrepreneurship comes from the transformation of an idea or concept into action (Lilleväli, Täks 2017). Ever since the beginning of human civilization, there has been a constant evolution and development that has marked progress in all disciplines and fields of life (Gautam *et al.* 2015). Having the vision to do things smartly, that is, beyond the constraints of resources and rules is what defines entrepreneurship (Hoog, Skoumpopoulou 2019). Hence, it is not just about creating ventures and the value creation process, but it is the essence which extends beyond contemporary times and serves as an agent of change and innovation (Lilleväli, Täks 2017). As a multifaceted phenomenon, entrepreneurship education requires individuals to think outside of the box, take risks and adopt a dogmatic approach to overcome fears and failures (Li, Chao 2010). Only then, individuals can drive the economy towards growth and progress (Saukkonen 2017, 1). In light of this, an entrepreneur is an individual who is capable of transforming ideas into reality through their creativity, risk taking, and innovation alongside their ability to plan and manage the ventures under consideration (Hayes 2021).

Following similar lines, entrepreneurship education may be defined as a process that requires the individual to apply the acquired knowledge, attitude, skills, and the competencies in a professional sphere (Gautam *et al.* 2015). It is important to mention that entrepreneurship extends beyond the limited scope of fostering creativity and self-management, but it is a formal and professional process of learning the key skills and competencies to become independent business entities and lead organizations by utilizing the creative spark (*Ibid.*). Moreover, entrepreneurship education is about creation; to create and nurture an environment that promotes entrepreneurship competencies and competencies alongside entrepreneurial traits like independent thinking, risk taking, valuing diversity and assuming roles as a responsible body are among the key objectives of entrepreneurship education (Hoog, Skoumpopoulou 2019). The primary objective of

entrepreneurship education is to develop students' intention, initiative-taking, skills, attitude, and a knowledge set that caters to all these components (Boldureanu *et al*. 2019). Entrepreneurship requires inner-directedness and the willingness to take the initiative (Küttim *et al.* 2014).

For this, entrepreneurship education focuses on creation to help potential entrepreneurs and entrepreneurial employees identify and pursue opportunities that are not limited to new jobs and startups (Bosma *et al.* 2004). In addition to this, risk taking is another fundamental quality of entrepreneurs and among the core objectives of EE is to prepare individuals to be entrepreneurial employees because the corporate sector is increasingly looking for ways to improve the entrepreneurial behavior of individual employees (Kerr *et al.* 2017). Furthermore, EE tends to benefit the younger lot by enabling them to be self-confident in whatever path they undertake which is why it is referred to as a competency for all (Li, Wu 2019; Zwan, *et al.* 2016). Among the basic characteristics of entrepreneurship education as a discipline, it has been used as a function of innovation (Groenewegen 1993), a function of fostering leadership (Kirby 2004), and an organizational building function (Zahra, *et al.* 2017a, 2017b). It has also been defined as a function of high achievement (Vesper, Gartner 1997), and a function of creation and operation of an enterprise (Zahra *et al.* 2017a, 2017b).

The field of education in the EU has recognized that entrepreneurship and the sense of initiative, are among the core competencies required to succeed in today's world (Komarkova *et al.* 2015). In the last decade, several measures have been taken to incorporate entrepreneurship as a competence via higher education curriculum and vocational training (*Ibid.*). There has been a significant emphasis on entrepreneurship education with reference to personal development which includes a growth mindset, communication, team building, problem-solving and critical thinking, financial literacy, and metacognition (Ustav, Venesaar 2018).

The conceptualization of human capital was put forward by Gary Becker in 1964 (Teixeira 2014) and was further formalized by Mincer in 1974 (Mincer 1974) for an estimation of employee's productivity based on skills, training and experience acquired through education (Lepak, Snell 1999). Generally, human capital is the overall practical experience and education of an individual (Lagakos, *et al.* 2012). However, in specific terms and with reference to entrepreneurship education, human capital is related to the education and experience with a scope of application limited to a particular activity or context (Dimov, Shepherd 2005).

This concept was introduced in entrepreneurship for the estimation of success in entrepreneurship and related activities (Bosma *et al.* 2004). The theory reinforces the idea that human capital enhances individual capabilities to discover and exploit opportunities that might not be apparent to others (Shane, Venkataraman 2000). Still, the fundamental relationship between entrepreneurship and human capital varies in the literature as in some cases, it is a significant relationship (Frese, Fay 2001), but studies have reported a low relationship (Honig, Davidsson 2000).

As posited by the human capital theory**,** human capital is the most critical resource that leads small firms to improve their survival chances significantly (Frese, Fay 2001). Rodriguez & Becker (1994) defines human capital to be different from physical or financial resources. It primarily concerns education, training, technology and etiquette, and it holds that they all contribute to the individual's wellbeing (Rodriguez, Becker 1994). It also refers to knowledge, personal characteristics and social habits as constituents of the human capital because it fosters creativity (*Ibid.*).

Entrepreneurship Education is currently in a transitional state, which is why business schools and higher education are introducing transformative changes at the technological and conceptual levels including introducing new models, new frameworks, and new learning modes like eLearning and entrepreneurship networks (Welsh *et al.* 2016). Some higher education institutes reflect the influx of innovation and entrepreneurship education through their curriculums to diversify the environment to develop attitudes, skills, and competencies (*Ibid.*). The works of Steinberg related to the changes in cognitive behavior and affective development in adolescence (Steinberg 2005).

EE helps students by helping them frame previous entrepreneurial efforts as success or failure and it encourages students to evaluate success and failure by managing self-attribution (Welsh *et al.* 2016). That is, not blaming the environment or personnel for the success or failure of ventures but having the courage to find reasons within the self (*Ibid.*). According to this statement by Wesh (2016) entrepreneurship education boosts confidence, self-efficacy and inculcates a sense of responsibility and consequentialism. Now, the extent to which students can see themselves as entrepreneurs is closely knitted into the fabric of self-perception (Steinberg, 2005). How do they

view themselves? How deep are they into building a self-identity and their self-concept? Hence, it shapes how far they aim and how far they are willing to go (*Ibid.*).

Consistent with the studies conducted in this field, entrepreneurs fail at the initial ventures, and it takes a while for them to hit the jackpot (Hoog, Skoumpopoulou 2019). Here, the notion surrounding failure has to be changed as entrepreneurship education aims to prepare the students to face such instances (Mulder 2017). They must view it as a part of the process, as a part of the change process, which is training them by imparting the necessary experience, only when they view failure as part of the game, as the first attempt, can they break through the cycle of winning at the first try (*Ibid.*).

One model, one curriculum, or one framework might not apply to the unique individuals involved, but instead, the process is distinctive (Boldureanu 2020). EE comes in handy when teaching the specifics in flexibility, adaptability, and resilience, hence enabling the students to be effective agents of creative destruction (Neck *et al.* 2014). As a result, they can be pioneers of new processes and new products (*Ibid.*). In a study (Welsh *et al*. 2016) conducted to evaluate the impact of EE in higher education, the results indicated that it positively impacts the students' personal growth, confidence, and identity development. While one framework or model does not apply to all, motivation exists as a common ground and thread for entrepreneurship successes (Saim *et al.* 2015). For instance, a positive relationship found between economic development and human capital, and the empirical pieces of evidence have been used to justify government subsidies for training and education (Rodriguez, Becker 1994). Thus, entrepreneurship education and the development of competence is not limited to the acquisition of knowledge, but it is linked to the individual's ability to act and respond to situations in an entrepreneurial manner (Lilleväli, Täks 2017). This includes the individual's attitude and behavior which matters more than the theoretical and practical knowledge about how to run a business (*Ibid.*). Through EE, students can build their capacities to aspire higher in life and achieve more which is why the ongoing pandemic has brought a focus on the reimaging of the education sector given that entrepreneurship is a major part of the global economic recovery (Langston 2020). When creative ideas and actions apply to economic purposes, it contributes to bringing in cash-inflows (Yar *et al.* 2008). Hence, countries and organizations with more outstanding human capital are better off in the competitive market and have better chances of accomplishing their goal (Chen, Chang 2010).

As the most flexible form of production that is quick to respond to market needs, EE encourages and supports the timely and structural changes in the economy (Boldureanu 2020). Here, the development of entrepreneurs refers to the development of young individuals to be the carriers of innovative ideas and the authors of techniques as well as technologies (Bendassolli *et al.* 2016). This responsibility further weighs on the individual and requires them to self-manage their knowledge, attitudes, and skills to progress (*Ibid.*). Hence, the more an individual remains true to the ethical principles, and polish their skills of creativity, strategic and critical thinking, independent decision making, and effective communication and negotiation - the more likely it is for them to excel in their chosen entrepreneurial ventures (Alieksieieva *et al.* 2021).

The strategic goal of modern entrepreneurship education is to create individuals with a higher degree of self-sufficiency and creativity that is coupled with innovative thinking (Ndofirepi 2020). Only then the individuals can be better at responding to the current challenges in an adequate manner (*Ibid.*). Having the ability to self-start a venture and be self-sufficient along the way is considerably related to self-management, where the individual's desire and motivation to grow and continue growing are critical factors (Alieksieieva *et al.* 2021). It may involve acquiring new skills, diversifying their existing profiles, actively controlling their emotions and temperament, and being self-aware of their strengths and weaknesses (Li, Chao 2010). Entrepreneurship is considerably associated with the entrepreneur's knowledge, attitude, and skill, and all these can be managed and acquired through consistent efforts towards the goal (Ndofirepi 2020).

1.1. Entrepreneurship competence development

Entrepreneurship competence development is crucial for entrepreneurial action, and previous studies suggest that competence is reflected in interacting with the environment under different circumstances (Johannisson 1991). The ability to produce desired results and mitigate the effects of unwanted events is what highlights the competence (Deist, Winterton 2007). Also, the ability to sense uncertainty and adapt to changes accordingly allows entrepreneurs to become flexible, self-regulated and dynamic, reflecting the highest category of competence achievable (Haynie, Shepherd 2009).

Entrepreneurship competence and entrepreneurship competencies are two terms which are to describe the distinct characteristics of entrepreneurship competence (Sinha *et al.* 2020).

Entrepreneurship competence concerns 'what' people do, whereas entrepreneurship competency focuses on 'how' people do it. Competence and competency may be useful terms for bridging the gap between education and job specifications (Chen, Chang 2010). While there are many theoretical approaches for the conceptualization of competence, Mulder tell that competence is seen as a series of integrated capabilities consisting of clusters of knowledge, skills, and attitudes necessarily conditional for task performance and problem solving and for being able to function effectively in a certain profession, organization, job, role, and situation (Mulder 2018).

Chen *et al.* (2015) explains competence as the ability to successfully meet complex demands in a particular context through the mobilization of psychological prerequisites (including both cognitive and noncognitive aspects). There is an interface between the two where the competent application of knowledge or skills makes one respond to the problems competently (*Ibid.*). Both have three components; skill, attitude, and knowledge (Sinha *et al*. 2020). Continuing the discussion, entrepreneurship competencies refer to an outcome-based approach in entrepreneurship while the main focus remains on actions, performance, and assessment (Mei, Symaco 2020). On the other hand, competencies stick to the attitude-based approach, which primarily focuses on behaviors, personality traits, motivation, or drive (Ustav, Venesaar 2018). Hence, the shared attributes are knowledge, skill, and attitude, contributing to competence and shaping an entrepreneur's core competence in the market field (Linton, Klinton 2019).

For the development of competence, two of the most important and critical investments in human capital are required where education and training are significant components (Rodriguez, Becker 1994). However, while education equips the individual with the necessary knowledge, it also trains them to counter and tackle the challenges faced in life (Langston 2020). They are trained to develop solutions and pull themselves out of the hard times by utilizing their knowledge and skill-sets as they are trained in schools and higher education (Siam *et al.* 2015).

The main difference is that they have the knowledge base to deduce the solution but to what extent they utilize their knowledge or curate solutions depends on their drive, behavior, and attitude towards the problems, varies per individual (*Ibid.*).

Opposing the common notion that entrepreneurs are born, it is more appropriate to say that entrepreneurs are made via consistent efforts, mistakes, and hard work (Arora 2012). Research

(Welsh *et al.* 2011) shows that entrepreneurs exhibit a strong internal locus of control, focus, and the ability to recognize opportunities. It reflects in their behavior and personal characteristics like determination, optimism, and the willingness to innovate (Gautam *et al.* 2015). A high need for success makes individuals set goals, and based on their experiences, they gain additional skills (Welsh *et al.* 2011). Students are in a transitional stage between early adulthood and adolescence, thereby using multiple variables in semantic ways and considering abstract relationships (Steinberg 2005). Hence, the university environment provides firm grounds for the development of entrepreneurship competence (Welsh *et al.* 2011).

The knowledge of the competencies in the market has been now added to the primary education regarding entrepreneurship in all business education systems (Gibb 1996). Senior professors from various backgrounds stand firm that education in every institution should be compatible with the world outside today (Goldsby *et al.* 2021). The gap between skillset and knowledge should be eradicated or else made smaller (Margherita *et al.* 2016). Thus, competency-based education must shape balanced, useful, and ethical graduates to serve society (Mulder *et al.* 2009). The goal for educators should be to formulate a plan focusing on making skill and knowledge compatible and the plan should cater to both academic and societal needs (Wei *et al.* 2019).

The entrepreneurship education should include definition, basics and business opportunities, monitoring, and evaluation to aid their initial stages of learning for beginners (Linton, Klinton 2019). To identify competencies that can be named in entrepreneurship education, different models have been used to facilitate student centered learning, and the approach should be based on design thinking, which refers to students stepping outside of the class and learn through experimentation and interaction (*Ibid.*).

The phenomenon of competency is regarding entrepreneurship selection and education to form new effective patterns for interference (Mojab *et al.* 2011). The point of view that entrepreneurship skills can be developed by focusing on education further stresses that entrepreneur competencies are changeable and accessed conveniently (Ghafar 2020) Internal traits are recognized when motivation and character competencies are taken under consideration (Mojab *et al.* 2011). Some are easier to access some on the other hand, are difficult to be dealt with (*Ibid.*). Different levels of competencies include individuals' characteristics, and these levels are not entirely separated

(Izquierdo, Buyens 2008). It means competencies always contain a single goal, motivation, power, or features that cause moving on and achieving the result (Ndofirepi 2020).

The competency-based approach in entrepreneurship education today, emphasizes how learners can adapt to new environments that are often shadowed by uncertainty and a not-so-constant environment (Mojab *et al.* 2011). In this regard, individuals' need for entrepreneurship and entrepreneurial competencies has been considered one of the main priorities in entrepreneurship education and teaching (Neck, Greene 2014). Specific competencies should be practiced to be comfortable in an uncertain environment (Mulder 2017). The goal of competency-based education must be balanced, useful, and ethical training of graduates to serve society (Mulder *et al.* 2009).

In light of this, entrepreneurship competence refers to the aggregation of all entrepreneurs' necessary skillset, skillset, internal traits, attitude, wisdom, and expertise, including managerial, social-economical, and other various specifications (Mulder 2017; Mulder *et al.* 2009). It is consistent with the qualities of self-management and can be further explained as the ability to manage your workflow and productivity in the workplace (Goldsby *et al.* 2021). A part of developing entrepreneurship competence focuses on self-management in terms of stress and emotion management (Alieksieieva *et al.* 2021).

Without a doubt, the responsibility of the entire venture relies on the shoulders of the entrepreneur, and the pressures at any given point can be enough to detract the progress (*Ibid.*). Entrepreneurship competence, self-management is to be able to take responsibility for oneself, and effective self-management relies on skills like taking the initiative (Neck *et al.* 2021). Taking the initiative refers to self-starting and taking ownership of the responsibilities when responding to challenges without any external prompts (Goldsby *et al.* 2021). It also includes one's resilience, which is the ability to adapt and bounce back if things go wrong. Time management, flexibility in work and work ethic, and assertiveness to ensure their voices are heard constitute self-management competences, which contribute to the overall entrepreneurship competence of the individuals (Neck *et al.* 2021).

It is worth mentioning that self-management practices are consistent with the underlying foundations of self-leadership (Kumar *et al.* 2014). It may include specific behavioral and constructive thought pattern strategies and natural reward strategies to positively influence personal effectiveness and self-management (Goldsby *et al.* 2021). The behavior-focused

strategies attempt to increase the individual's self-awareness to facilitate behavioral management (Kim, *et al.* 2018). The constructive thought strategies focus on dysfunctional thoughts, doubts, mental imagery, and any negativity to be replaced with positive self-talk and self-confidence (Neck *et al.* 2019). Natural reward strategies tend to focus on shaping the thought patterns and habitual ways of thinking to contribute to the performance and have a positive influence (Alieksieieva *et al.* 2021). Only when individuals think positively and believe in themselves can they attain higher levels of entrepreneurship competence, which improves the subjective experience of entrepreneurship (Neck *et al.* 2021).

1.2. The role of higher education

Higher education has recognized the significance and importance of entrepreneurship for economic development (Ghina *et al.* 2017). There has been an increase in the personal development of the students under various entrepreneurship programs (Boldureanu *et al.* 2020). The primary purpose of these entrepreneurship programs is to guide students to apply for related jobs and create jobs (Davey *et al.* 2016).

To achieve better pedagogical value, it is crucial to recognize the goals to develop competence, impart knowledge, and comply with the plans that have been drafted for the future (Linton, Klinton 2019). To clarify these goals and work towards them more effectively, the term competence used interchangeably is introduced, which can help the educators form a better plan and achieve more clarity for the main objectives influence (Alieksieieva *et al.* 2021). It is essential to consider which specific competencies are deemed necessary to entrepreneurship education to form more firm and stealthy programs that can be implemented to aid higher education students in understanding the objective of entrepreneurship more clearly (Neck *et al.* 2014). The clarity in entrepreneurial competencies may support educators to choose content, define learning outcomes, develop the instructional design and appropriate methods for monitoring and evaluation (*Ibid.*).

In 2019, Ustyuzhina conducted a study to evaluate entrepreneurship competences in higher education engaged a total of 700 participants from top Russian universities. Results showed that 53% of the students were not ready to partake in entrepreneurial activities and stated reasons to be lack of knowledge, skills and practical experience (Ustyuzhina 2019). Hence, insufficient

development level of entrepreneurship education, lack of practical skills and lack of necessary practical knowledge were termed as the main reasons for this lack of readiness *(Ibid.).*

The business institutions have been under criticism for incompetent training, and that the guidance and curriculums are not aligned with the market demands (Solomon 2007). The main objection in this regard is that such movements limit the full potential of the students and aspiring entrepreneurs (Welbourne *et al.* 2012). Hence, the objection has been accepted as a challenge and efforts have been made to overcome the shortcomings (Kirby 2004). By developing a competences system, an organization acquires a clear structure and forms of desirable behavior in its operations (Mojab *et al*. 2011). The difference between successful entrepreneurs is shaped by the environment they have been a part of and the experiences they have gained (Boldureanu 2020). Here, higher education can greatly influence the development and evolution of one's entrepreneurship competence (Ghina, *et al.* 2017). It can prove to be an excellent environment for the development and evolution of entrepreneurship competence (Li, Chao 2010). Individuals become familiar with the significance of personal growth, decision-making, and critical thinking during the learning process (Mei, Symaco 2020).

Students who actively engage with the environment, be it the institute or the organization they work for, tend to adapt their ways of accomplishing the task assigned to them (Lozano *et al.* 2012). This is what drives them towards innovation because everything in entrepreneurship starts with the change in perspective that is the way individuals look at situations and events (*Ibid.*). When individuals actively seek new learning experiences, it drives them towards innovation and implementation (Wang *et al.* 2019). Such individuals rely on their observation when it comes to interpreting the problems (*Ibid.*). For instance, students in engineering, computer sciences, and business institutions are introduced to concepts like resource allocation, innovation and collaboration (Blaug 1976).

Higher education has a controlled environment and it gives students a margin to fail as it simply means a lesson learned (Davey *et al.* 2016). Higher education also focuses on competence and the development of related attributes implicitly (Ghina *et al.* 2017). Since entrepreneurship education is influencing the establishment of new business ventures (*Ibid.*), some schools and universities have now introduced specific programs like innovation, entrepreneurship, and a combination of these two fields (Wei *et al*. 2019).

Currently, less than one-fourth of the students in the EU have partook courses related to entrepreneurship (Lilleväli, Täks 2017). The reason stated for this is lack of guidelines concerning teaching methods for competence development as very few institutes include practical experience as mandatory (*Ibid.*). Hence, the learning outcomes are fragmented, resulting in insufficient assessment of EE learning outcomes and competence development (Morselli 2019). Which is why individuals who wish to move in this particular direction, should organize and polish their skills when they are in universities (Ustyuzhina 2019). Moreover, universities can shape the literacy culture by focusing on personal development where critical thinking and problem-solving are critical (Welsh *et al.* 2011). The primary requirement for a successful entrepreneur is to have a growth mindset, metacognition, and autonomous motivation to push through the obstacles and rise above emotional limits (Linton, Klinton 2019). It further requires a practical and systematic approach to counter the challenges and mitigate risks (Langston 2021).

Self-management and managing social situations are important for an entrepreneur as it facilitates and aids the process of venturing, managing and organizing an enterprise (Neck *et al.* 2021). For efficiently and competitively running an enterprise and being an entrepreneurial employee, the realization of goals along with the motivation to continue is crucial (Bendassolli *et al.* 2016). It calls for a systematic and specifically designed curriculum so that students can develop the necessary skills and train themselves in an attempt to prepare themselves for what lies ahead (Hoog, Skoumpopoulou 2019). The modern EE focuses on self-management, and by making entrepreneurship competences explicit, students can make informed decisions and work towards their goals in a much focused manner (Alieksieieva *et al.* 2021.

1.3. Overview of entrepreneurship competence model

One of the measures developed by the European Commission, to support entrepreneurship and related competences in the world of work, education and learning, is the reference framework for Entrepreneurship Competence, also known as the EntreComp.The Entrepreneurship Competence Framework or EntreComp proposes a shared definition of entrepreneurship as a competence. This framework raises a consensus among stakeholders to bridge the gap between education and work. Hence, it acts as a reference to foster entrepreneurship capacity, comprising 3 main interconnected competence areas, ideas and opportunities, resources and into action. Each area has 5 competences which act as sub-areas in entrepreneurship as a competence. Furthermore, it develops 15 competences and proposes a list of 442 learning outcomes that can serve as the basis for learning activities and curricula in this field. The EntreComp framework is still developing, and till now, it has been validated through iterative stakeholder consultations (Margherita *et al*. 2016).

However, the origin of this model dates back to 2006, when a sense of initiative and entrepreneurship was recognized as one of the key competences for all citizens (European Parliament and the Council, 2006) to identify the particular skill-set that makes a successful entrepreneur (Gianiodis, Meek 2019). The entrepreneurship competence model is flexible, and comprehensively lists the core competences which can be developed and applied in all spheres of life to enhance the personal growth of individuals, as entrepreneurial employees or self-employed persons (Margherita *et al.* 2016).

In addition to this, there are many other models of entrepreneurship competence has been developed, one those include Model of Teachable Entrepreneurship Competencies (M-TEC) scale model as example to measure the competencies. This scale consists of 38 items that are related to nine types of competencies (Peschl *et al.* 2021). They are classified into four dimensions; entrepreneurship, management and business, human resources, and interpersonal competencies *(Ibid.*). Various studies have tested this scale, and the results are consistent with the reliability of this scale (Silveyra *et al.* 2021).

Other than EU, other stakeholders were also working to develop entreprenueship competence models and one of those was developed in US, under the department of employment and training administration. This entrepreneurship competency model consists of nine tiers, where the first three are related to the foundation competencies like: 1) personal effectiveness, 2) academic effectiveness, 3) workplace eeffectiveness. Tier 4 is related to technical competencies and tier 5 is related to the entrepreneurial focus areas. Tiers 6 through 9 are representative of the specialization which occurs within specific occupations in an industry, which are: 6) occupation specific knowedge areas, 7) occupation specific technical competencies, 8) occupation specific requirments, 9) management competencies. (Employment… 2021). There are also several approaches for assessing entrepreneurship competence, and different models may follow different approaches for the assessment of entrepreneurship competence (Innove 2016; Margherita *et al*. 2016).

This research thesis follows the Estonian Entrepreneurship Competence model to evaluate the efficacy of higher education as an environment for entrepreneurship competence development (Innove 2016). The primary reason for choosing this is the comprehensiveness of this framework as it includes all the relevant and necessary knowledge, skills, and attitudes important for fresh graduates to become entrepreneurs or entrepreneurial employees after graduation (Trasberg 2021).

Several models and frameworks have been used to evaluate entrepreneurship competences, and researchers have taken different approaches to assessing the specific competencies and the relationship between behaviours, knowledge, and skills (Zdolšek *et al.* 2018). For instance, Chandler, Jansen (1992) evaluated the necessary skills for entrepreneurial action and suggested that the core entrepreneurial competences are representative of the ability to identify entrepreneurship opportunities. Entrepreneurship competences can be learned, and the characteristics of an individual are accessible (Bird 1995). Factors that influence the development of entrepreneurship competence include education, work experience and entrepreneurship experience (*Ibid.*).

It is important to evaluate the environment imparted by higher education, and assess if it is appropriate for the development of entrepreneurship competence basis (Venesaar *et al.* 2018). Reiterating the scope of this research study, it is limited to entrepreneurship competence, that is: opportunity identification, evaluation, and pursuit, along with creating value (Deist, Winterton

2007). In this research study, the author proceeds to assess self-management and its relationship with entrepreneurship competences in general.

However, within the context of Estonia, the entrepreneurship courses have followed the principles of a narrow approach, which means that the courses have been focused on supporting new business ventures and value creation. To meet the gaps in research regarding a consistent framework for adopting or approaching EE throughout higher education, the Estonian Ministry of Education and Research launched a program to justify the entrepreneurship competence model that was designed for the development of entrepreneurship education in Estonia (Küttim *et al.* 2014).

The entrepreneurship competence and sub-competencies were developed based on the definition that entrepreneurship is when individuals act upon the ideas and opportunities and transform them into value for others (Innove 2016). The entrepreneurship competence model used in this study was based on understanding the entrepreneurship process and identifying the competencies required in various phases for opportunity, discovery, and the implementation of ideas basis (Venesaar *et al.* 2018).

For the explanation of the mutual relationships of chosen sub-competencies in the entrepreneurship competence model, the theories from other fields like education, psychology, and entrepreneurship were included, which then served as the theoretical basis. The theoretical basis was combined with the laws of human thinking and the general development and functioning of the human brain. In addition to developing the entrepreneurship competence model, an assessment tool was also developed based on the adopted constructs from earlier studies. The statements in the questionnaire focused on the relationships between sub-competencies, that were divided into four competence areas (*Ibid.*):

i) self-management
ii) solving of social situations
iii) creative thinking
iv) acting upon opportunities

The framework used in this study contributes to the discussion on developing entrepreneurship competence at levels of education in Estonia.

Figure 1. Entrepreneurship Competence Model.
Source: Innove (2016)

This research study also uses this framework (Innove, 2016) to comment on the relationship between entrepreneurship competencies and their development in higher education.

2. RESEARCH METHODOLOGY

This chapter serves to comprehensively explain the research methodology as adopted for this research study. In the first section, the author explains the research design as adopted in this study. Followed by the sample, the data collection instrument and the research procedure that has been utilized. Each aspect of the research methodology has been explained in the subsequent sections to elaborate the methods in detail.

To achieve the research objectives and answer the research question effectively, the following research methodology was adopted. Reiterating the research questions for this research study:
RQ1: Does entrepreneurship education have an influence on students' assessments about entrepreneurship competence?
RQ2: How does the self-management and other entrepreneurship competencies relate?
RQ3: How does explicit learning experiences contribute to student assessments about entrepreneurship competence?

2.1. Research design

This research study adopts a descriptive approach, and focuses on the questions between self management and entrepreneurship competencies. While a quantitative research design may adopt a descriptive or experimental design, this study follows a quantitative research design, and the author utilizes statistical analysis to extract the end results from the data collected. The variables are not controlled, nor manipulated but observed and measured as per the data collected during the study period over the years

2.2. Sample

Sample is a convenient part of the population which allows for inferences to be made regarding the entire population. A good sample includes all the characteristics of the population so that the inferences drawn can be mapped on to the population with efficacy. The survey sample for this research study were students from Tallinn University of Technology. The respondents were students enrolled in Bachelor's and Master's courses related to Introduction to Entrepreneurship (TMJ0130), and Entrepreneurship and Business Planning (TMJ3300). The courses were 16 weeks

compulsory courses, and the students were asked to fill the survey questionnaire at the beginning and at the end of these courses. It was to understand their initial level of understanding and perception concerning Entrepreneurship Education and to measure the impact of the education. Given that this study's primary objective was to underpin students' entrepreneurship competence development in higher education, the students from Tallinn University of Technology were deemed fit, and hence, were recruited as the sample.

Please note that the study was conducted by the faculty of Tallinn University of Technology in two semesters, the fall semester 2019 and spring and fall semesters 2020. The database was provided by the supervisor to the author, for further analysis.

2.3. Instrument

For data collection, a survey questionnaire was used to record students' responses regarding entrepreneurship competencies. The questionnaire served as the main instrument and provided the author with the necessary data needed to extract the results.

In light of this, the author required the data to measure the influence of entrepreneurship education on students' assessments of entrepreneurship competence, and to recognize the relationship between self-management and entrepreneurship competence.

The survey questionnaire was developed for mapping the main areas connected with entrepreneurship behavior and entrepreneurial attitude. The self-assessment provides feedback for the learner as well as for teacher/supervisor on how to make a learning process better for students. The data was used confidentially only for generalizations for the development of teaching on how to support the development of entrepreneurship competence among students.
The sub-competences included the following (Innove 2016):

- Metacognition
- Growth Mindset
- Creativity
- Autonomous motivation
- Problem solving
- Planning

- Ethical thinking and sustainability
- Communication
- Personal initiative
- Cooperation
- Business opportunity
- Business environment
- Financial literacy
- Coping with emotion

The self-assessment is carried out at the beginning and at the end of the course and in entrepreneurship education this is a part of the study process. After the data collection procedure, all competences were evaluated using descriptive statistical tests like descriptive statistics, correlation analysis, and comparative analysis to comprehensively see the trends.

To evaluate higher education as a suitable environment for student's entrepreneurship competence development, the author proceeded by conducting a thorough literature review to understand the context. Following this, the author proceeded to conduct the study among students of Tallinn University of Technology, and participants included students from Bachelor's and Master's courses.

The data collection method was a survey questionnaire to measure sub-competencies in entrepreneurship competence. The data was collected in two main phases.

The initial survey was circulated among students during the initial lecture classes, and the objective was to gather information regarding student's initial perceptions regarding entrepreneurship education.

Following this, for some student's entrepreneurship competence was included in the studies, and was made explicit by using special methodology, while for some students it was not. After the successful implementation of action learning methods, the survey was circulated again after the study to evaluate the impact of higher education as a suitable environment for entrepreneurship competence development.

The gathered data was analyzed in SPSS to answer the research questions effectively. Given that the study spanned over a period of 16 weeks. It provided firm grounds to evaluate the influence of entrepreneurship education on student's assessment about entrepreneurship competence and the impact of explicit learning experiences. Moreover, it provided the necessary data to describe the relationship between self-management and other entrepreneurship competencies.

3. FINDINGS AND DISCUSION

So far, the author has presented the literature review and research methodology as adopted in this study. In this chapter, the author presents the results as retrieved from the data collected. The data was analyzed using SPSS by conducting a series of statistical tests to measure the responses. In this chapter, the author begins by presenting the overall data to give the reader an overview of the findings of this study, followed by specific analysis of the sub-competencies related to self-management. The descriptive statistics, which includes the results related to gender, nationality, education levels and type of studies. Following this, the results for paired sample statistics are presented which indicates the frequency of the responses collected, along with the mean responses, standard error and standard deviation for the sub-competences as mentioned in the previous chapter. Next, the author presents the correlation and comparative analysis to further analyze the dataset and identify any further points of analysis.

3.1 Graphical representation of demographics

There were a total of 1086 respondents (N=1086), in the study and the analysis was done given the two groups; piloting self assessment (n=219) and the traditional EE (684). The main dataset had participants from other groups as well, but that does not lie within the scope of this study.

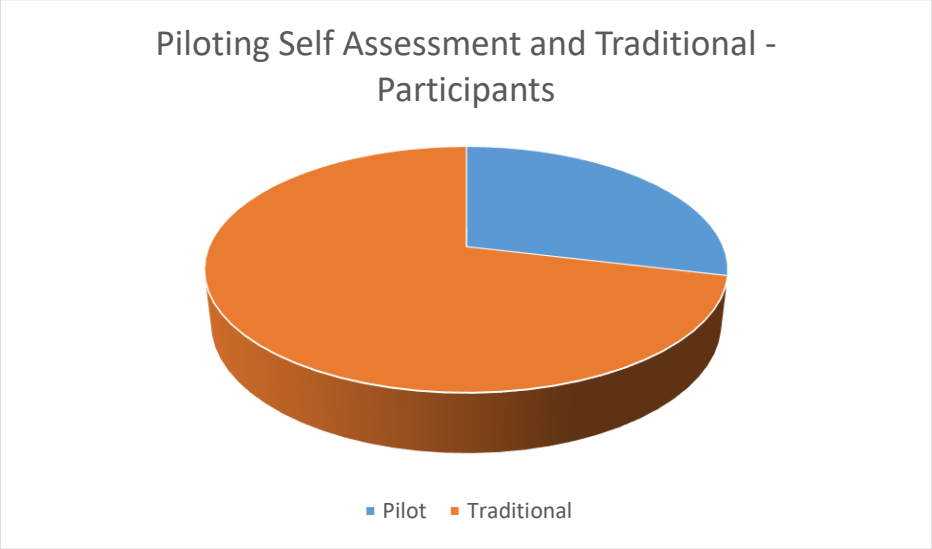

Figure 2. Summary of the participants

Source: Author's calculations based on the Dataset (Excel Graphs; SPSS calculations)

Figure 3 illustrates the grouping of the participants. As mentioned that the overall dataset had a total of 1087 participants, the groups were formed from within the main dataset on the basis of two factors, piloting self assessments and the traditional EE. For the pilot group, the learning experiences were made explicit to see if it has any influence on their assessments about entrepreneurship competence.

The traditional group had participants who continued with the traditional methods, and for them the learning experiences for entrepreneurship competence were not made explicit.

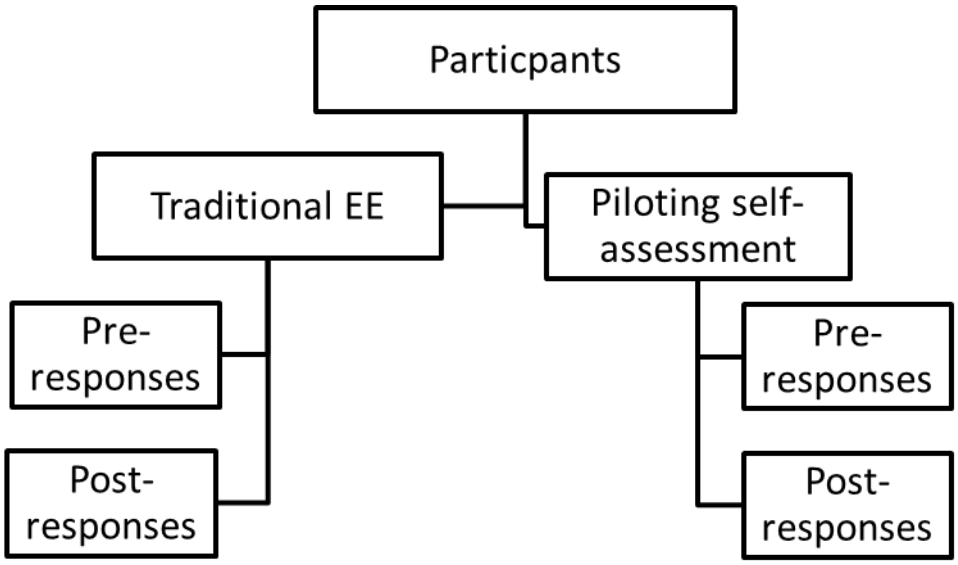

Figure 3. Sub-classification of participants for pilot assessments and traditional EE
Source: Author's cassification of subgroups under consideration

In figure 4, the summary for the education level has been presented where the majority of the participants were from the Master's level, and then Bachelor's level. Only a few participants were from higher education and other.

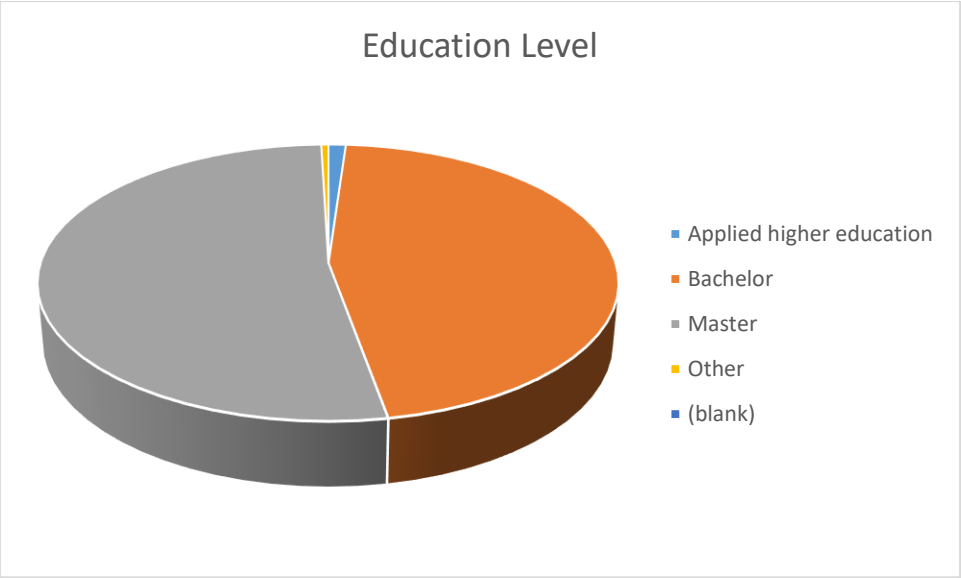

Figure 4. Summary of participants based on education level
Source: Author's cassification of subgroups under consideration

Frequency of education level shows that 12 respondents responded that they have applied for higher education, 500 respondents were studying at bachelor's level, and 570 respondents were studying at master's level, while 5 marked the other category of educational level. Majority of the respondents i.e., 52.4% respondents were studying at master's level, while 46% respondents' educational level is bachelors' program.

These figures present the general representation of the dataset, and presents the summary for the overall data.

3.2. Student's assessments of the entrepreneurship competence

Descriptive statistics is used to summarize the dataset. Here, it was used to derive a summary of the responses to measure the participants' age group, gender, level of education, and nationality. This was to gain insights regarding the sample and measure the demographic statistics generally. Following this, the next task was to analyze the responses. The responses as presented table 1 have been calculated for the entire dataset, and the results help compute student's assessments about entrepreneruship competence based on self-assessments.

Table 1. Students' assessments of the entrepreneurship competence sub-competencies based on self-assessment.

Sub competencies	M	S.D
Metacognition 1	4.09	0.61
Metacognition 2	4.24	0.58
Growth Mindset 1	3.94	0.76
Growth Mindset 2	3.86	0.86
Creativity 1	3.78	0.77
Creativity 2	4.00	0.74
Autonomous motivation 1	3.39	0.50
Autonomous motivation 2	3.45	0.50
Problem solving 1	3.92	0.62
Problem solving 2	4.05	0.59
Planning 1	3.66	0.71
Planning 2	3.80	0.68
Ethical thinking and sustainability 1	3.64	0.67
Ethical thinking and sustainability 2	3.83	0.66
Communication 1	3.94	0.69
Communication 2	4.03	0.67
Personal initiative 1	3.72	0.67
Personal initiative 2	3.85	0.65
Cooperation 1	4.19	0.64
Cooperation 2	4.26	0.64
Business opportunity 1	3.41	0.71
Business opportunity 2	3.65	0.71
Business environment 1	3.61	0.68
Business environment 2	3.91	0.63
Financial literacy 1	4.06	0.70
Financial literacy 2	4.17	0.65
Coping with emotions 1	3.71	0.73
Coping with emotions 2	3.76	0.72
M=Mean; S.D= Standard Deviation; N=1087		

Source: Author's calculations based on the raw dataset (SPSS)

The mean and standard deviation response have been presented for the items as calculated before (e.g. abc1) and after (e.g. abc2) the study. The data was analyzed considering the research objectives and research questions of this study. For this, the competencies as indicated in the table

above were evaluated in-depth. The pairs have items labeled as ‘1’, and ‘2’; where ‘1’ indicates responses as recorded before the study, and ‘2’ indicates responses for the items as recorded after the study. This was to visualize the responses and see if there are any differences; increase or decrease in the mean value to comment on student’s assessments of entrepreneurship competence.

Please note that the responses for Metacognition 1, score an average response of 4.09, while for Metacognition 2, it can be noted at 4.24. Similarly for Growth Mindset, the recorded values are at 3.94 and 3.85 which reflects a slightly negative value. However, Autonomous motivation (3.39 to 3.45) and coping with emotions (3.71 to 3.76), both reflect a positive trend. It shows that sub-competencies such as metacognition, growth mindset, creativity, autonomous motivation,problem-solvingg, planning, Ethical thinking and sustainability, communication, personal initiative, cooperation, business opportunity, business environment, financial literacy, and coping with emotions are improved after the study. However, the difference are minimal, the slight increase in responses are indicative of a positive impact on student’s assessments. This can be further backed by the values for standard deviation which indicate values close of 0.5. A lower standard deviation means that the responses calculated for the participants are clustered around the mean value, and that the average responses as collected for individual competencies are similar for all participants throughout the dataset.

Hence, the means and standard deviations were primarily calculated to measure the influence of EE on student’s assessments of entrepreneurship competence. Based on the values presented above, the influence on student’s assessments can be concluded as very low as the differences between the mean responses are quiet low. The mean difference between metacognition 1 and 2 is 0.15, which is positive and shows that EE has a positive influence on this competence. Likewise, coping with emotions has a mean difference of 0.05, which is positive again. Still, the remaining competences like growth mindset (-0.08), creativity (-0.22), autonomous motivation (-0.06), planning (-0.14), cooperation (-0.11) and financial literacy (0.11), all indicate a negative mean difference. A negative mean difference shows that that the after the study, the responses calculated were lower on these competences indicating a negative influence on student’s assessments of EC, except for metacognition and coping with emotions, which are influenced positively.
Summarizing the findings here, EE does have an influence on student’s assessments of entrepreneurship competence, and it can be concluded that the influence is rather negative.

3.3. Relationship between entrepreneurship competence and self-management

The correlation values determine whether a weak, moderate or strong relationship is present amongst the variables, and the negative and positive signs show the direction of the relationship. The spearman correlations have been calculated between entrepreneurship competence, and sub-competences under self-management. The correlation values denoted by a single *, shows the values significant at p=0.05, whereas the values denoted by **, indicate p=0.01. The values in apendix 2 allows for the conclusion regarding the significance of the relationship present in before and after cases of all pairs of entrepreneurship competence under study, with self-management. The correlation values less than 0.25 indicate a negligible relationship which is why the entrepreneurship competences that had a lower correlation co-efficient were removed so that only the competence that share a relationship are present.

This was to make the results more readable, and more relevant within the context of this study. The correlation values between the range 0.25-0.5 are indicative of a weak to moderate relationship, and the values above 0.5 indicate a moderate to strong relationship, with 1 being the perfect relationship. Hence, based on this, the correlation values higher than 0.35 have been indicated to narrow down the competences that share a considerable relationship with self-management.

Appendix 1 shows the correlation of sub competencies before the study. All dimensions were positively correlated as M1 and GM1 (r=.01 p<.05), CI and GM1 (r=.11, p <.05), AMI and CI (r=.08; p <.05), PS1 and AMI (r=.18; p <.05), P1 and PS1 (r=.52, p<.05), ETS1 and P1 (r=33, p<.05), C1 and ETS (r=.28, p <.05), P1 and C1 (r=.51, p <.05), CO1 and PI1 (r=.38, p<.05), BO1 and CO1 (r=.27, p<.05), BE1 and BO1 (r=.48, p <.05), EL1 and BE1 (r=.36, p<.05) and CE1 and FL1 (r=.26, p<.05), (appendix 1). It reveals that increase in metacognition increase the growth mind, increase in creativity increase the growth mind, increase in autonomous motivation increase the communication, increase in communication increase the ethical thinking and sustainability, increase in planning and increase the communication, increase in cooperation increase in planning, increase in business opportunity and increase in cooperation, increase in business environment increase the business opportunity, increase in ethical thinking and sustainability increase business environment and increase in coping with emotion increase the financial literacy.

All this further indicates that a positive correlation exists between these items, where a slight increase in one item leads to an increased response in the other. For instance, the correlation value for AM1 and M1 is 0.37*, which means that autonomous motivation and metacognition are positively correlated. An increase in autonomous motivation will lead to an increase in metacognition and vice versa.

The same exists for creativity and coping with emotions, 0.32*. The better the individual is able to cope with their emotions, the more creative they can be. All the figures present in appendix 1 allow for concluding the relationship between items that were conducted before the study, and it depicts a clearer picture of how these competences influence and shape student's assessments.

Appendix 2 is showing the correlation of sub competencies after the study. All dimensions were positively correlated as M2 and GM2 (r=.11 p<.05), C2 and GM2 (r=.13, p <.05), AM2 and C2 (r=.13; p <.05), PS2 and AM2 (r=.17; p <.05), P2 and PS2 (r=.55, p<.05), ETS2 and P2 (r=40, p<.05), C2 and ETS2 (r=.33, p <.05), P2 and C2 (r=.54, p <.05), CO2 and PI2 (r=.36, p<.05), BO2 and CO2 (r=.30, p<.05), BE2 and BO2 (r=.56, p <.05), EL2 and BE2 (r=.44, p<.05) and CE2 and FL2 (r=.31, p<.05), (appendix 2). It reveals that increase in metacognition increase the growth mind, increase in creativity increase the growth mind, increase in autonomous motivation increase the communication, increase in communication increase the ethical thinking and sustainability, increase in planning and increase the communication, increase in cooperation increase in planning, increase in business opportunity and increase in cooperation, increase in business environment increase the business opportunity, increase in ethical thinking and sustainability increase business environment and increase in coping with emotion increase the financial literacy.

The results here are much like the ones presented in appendix 1, but these figures are representative of how self-management and entrepreneurship competence relate after the study. Again, the correlation values are positive and indicate that by increasing one competency, we can observe an increase in the other.

Based on the findings presented in appendix 1 and 2, the relationship between self-management and entrepreneurship competence can be underpinned. Self management comprises of four competences that is; growth mindset, autonomous motivation, metacognition and coping with emotions. According to the results, the metacognition is weakly related with all other competences

as seen before and after the study. However, the relationship for the competences before the study can be seen within the range of negligible to weak as the correlation values are between 0-0.25, but after study correlation values are between 0.25-0.35, which is the range for a weak relationship. Hence, metacognition is weakly related with entrepreneurship competence.

Growth mindset and autonomous motivation show no relationship with other competences as all values are less than 0.25. For coping with emotions, a weak relationship can be observed with entrepreneurship competencies.

It highlights that self-management and entrepreneurship competences are weakly related which means that individual target areas, that is individual competences must be targeted for shaping the overall entrepreneurship competence. Relying on the interconnection or interrelationship of the competences might not yield desirable results.

3.4. Group comparison: pilot and traditional

T-tests are done to find the differences between two groups and the value of p calculated through this test allows us to comment if there are any statistically significant differences between the groups. It was done to calculate the differences between the two responses as collected before and after the study. The paired sample test was carried out to compare the differences more thoroughly. The mean response for the traditional group is 3.85, and for the pilot group, it is 3.88. The value of t stat is 1, and the values of p are greater than 0.01. These statistical results indicate that there are no statistically significant differences between the two groups and that the explicit learning experience might not influence students' assessments about entrepreneurship competence.
The results are as follows:

Table 2. Group Comparison: Pilot and Traditional

--	Traditional	Pilot
Mean	3.85	3.88
Variance	0.13	0.11
Observations	684	219
Pooled variance	0.13	
Hypothesized mean difference	0	

df	901	
t Stat	-1.00	
P(T<=t) one-tail	0.15	
t Critical one-tail	1.64	
P(T<=t) two-tail	0.31	
t Critical two-tail	1.96	

Source: Author's calculations based on the raw dataset (SPSS)

Table 3 reveals that in the group of pilot assessment after study the sub competencies such as Metacognition (M=-.12, p<.05), Creativity (M=-.24, p<.05), Problem solving (M=-.16, p<.05), Planning (M=-.17, p<.05), Ethical thinking and sustainability (M=-.21, p<.05), Communication (M=-.09, p<.05), personal initiative (M=-.15, p<.05), Business opportunity (M=-.26, p<.05), Business environment (M=-.29, p<.05) and Financial literacy (M=-.13, p<.05) were improved.

It is rather a detailed overview of the results presented in Table 2, as it draws a comparison between the paired competences as calculated before and after the study. Here, the two tables presented above are to highlight the differences between the two groups and to see if explicit learning experiences have any influences on students' assessments of EE. The results have indicated very minor differences as the recorded mean difference between the two groups is 0.03, and with the p-value greater than 0.01, it can be concluded that the differences between the two groups are significant. It proves that explicit learning experiences have little to no influence on students' assessments.

Table 3. Paired Differences for the Pilot Group

Sub-competencies		Paired Differences					t	Sig. (2-tailed)
		M	S.D	S.E Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Pair 1	M1 - M2	-.12	.67	.04	-.21	-.02	-2.62	.009
Pair 2	GM1-GM2	.02	.78	.05	-.08	.12	.43	.667
Pair 3	C1 - C2	-.24	.66	.04	-.33	-.15	-5.39	.000
Pair 4	AM1 -AM2	-.05	.51	.03	-.12	.01	-1.46	.145
Pair 5	PS1 - PS2	-.16	.52	.03	-.23	-.09	-4.61	.000
Pair 6	P1 - P2	-.17	.63	.04	-.25	-.08	-4.04	.000
Pair 7	ETS1-ETS2	-.21	.63	.04	-.30	-.13	-5.02	.000

Pair 8	C1 - C2	-.09	.54	.03	-.16	-.02	-2.54	.012
Pair 9	PI1 - PI2	-.15	.56	.03	-.22	-.07	-3.91	.000
Pair 10	CO1 - CO2	.02	.62	.04	-.05	.11	.68	.497
Pair 11	BO1 -BO2	-.26	.68	.04	-.35	-.17	-5.69	.000
Pair 12	BE1 –BE2	-.29	.64	.04	-.37	-.20	-6.71	.000
Pair 13	FL1 - FL2	-.13	.56	.03	-.20	-.05	-3.39	.001
Pair 14	CE1 - CE2	-.01	.58	.03	-.09	.06	-.45	.647

Source: Author's calculations based on the raw dataset (SPSS)

Hence, it shows the differences in paired values and allows for the calculation of mean statistical differences as observed before and after the study, specifically for the pilot group. Similar results have been presented in Table 4, that illustrates the responses for the traditional group.

Table 4. Paired Differences for the Traditional Group

Sub-competencies		Paired Differences					t	Sig. (2-tailed)
		M	S.D	S.E Mean	95% Confidence Interval of the Difference			
					Lower	Upper		
Pair 1	M1 - M2	-.19	.65	.02	-.24	-.14	-7.68	.000
Pair 2	GM1 - GM2	.13	.82	.03	.07	.19	4.30	.000
Pair 3	C1 - C2	-.22	.68	.02	-.27	-.17	-8.57	.000
Pair 4	AM1 - AM2	-.07	.59	.02	-.12	-.03	-3.47	.001
Pair 5	PS1 - PS2	-.13	.63	.02	-.17	-.08	-5.39	.000
Pair 6	P1 - P2	-.16	.71	.02	-.22	-.11	-6.16	.000
Pair 7	ETS1 - ETS2	-.17	.72	.02	-.23	-.12	-6.39	.000
Pair 8	C1 - C2	-.10	.60	.02	-.15	-.06	-4.72	.000
Pair 9	PI1 - PI2	-.15	.63	.02	-.20	-.11	-6.56	.000
Pair 10	CO1 - C2	-.13	.69	.02	-.18	-.08	-5.01	.000
Pair 11	BO1 - BO2	-.26	.71	.02	-.32	-.21	-9.80	.000
Pair 12	BE1 - BE1	-.34	.73	.02	-.40	-.29	-12.30	.000
Pair 13	FL1 - FL2	-.12	.64	.02	-.17	-.07	-5.21	.000
Pair 14	CE1 - CE2	-.07	.66	.02	-.12	-.02	-3.13	.002

Source: Author's calculations based on the raw dataset (SPSS)

To cement the results for the self-assessment and traditional EE groups, the figure below draws a comparison between the two groups. Each pair is represented by a different color to give the reader an idea regarding how the pairs acted in two groups. The Growth mindset, cooperation, and business opportunity have received the highest responses.

The results here allow for comparison regarding how explicit learning experiences contribute towards shaping students' assessments about entrepreneurship competence. The table 3 compares the groups; pilot and traditional. Based on the group comparison using a t-test, the results indicate no significant differences which means that explicit learning experiences do not contribute significantly to student's assessments of EC as the responses for the pilot group and the traditional group only indicate a mean difference of 0.03. This further highlights the minimal contribution of explicit learning experiences.

Figure 4 illustrates the responses, and different colors indicate different competences. The responses from the participants clearly indicate that the answers to the survey questionnaire have slightly more variations within the data for the traditional EE group which is a clear demonstration that entrepreneurship education has significant effect on the participants of piloting study in all four major areas such as self-management, managing social situations, creative thinking and finding solutions and acting upon opportunities and ideas. Also, autonomous motivation is lower for the pilot group as compared to traditional EE, and so does the responses for almost all other competences. However, cooperation is seen at a higher place than in the traditional EE group.

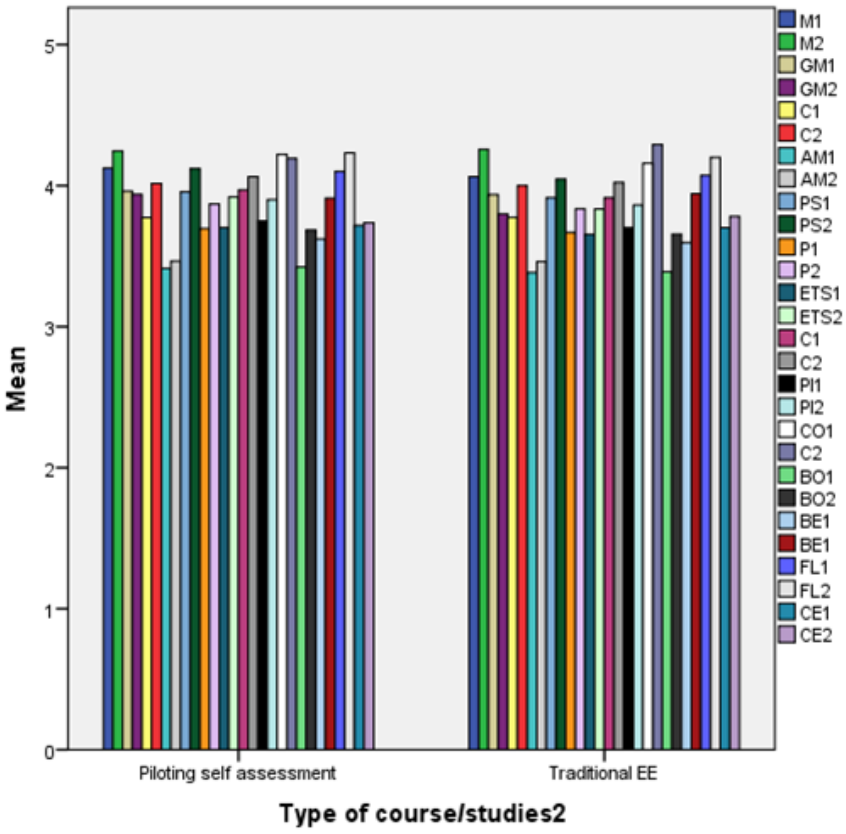

Figure 5. Group comparison: pilot and traditional
Source: Author's calculations based on the raw dataset (SPSS)

It can be deduced here that the student's assessments of entrepreneurship competence are influenced by explicit experiences, and that may decrease the overall perceptions towards EC, except for collaboration. A realistic picture can have this effect, because being aware of what the students are doing and learning provides them with a frontal view of what EC is, and what it requires as compared to the textbook and classroom discussions, that may not allow the students to see and compare themselves in a practical arena.

3.5. Discussion

Proceeding to discuss the overall results, the first research question was: Does entrepreneurship education have an influence on students' assessments about entrepreneurship competence? To answer this question, descriptive statistics were calculated to assess the difference in mean responses before and after the study. After measuring the demographic statistics to categorize the participants, the author calculated the mean and standard deviation of the responses. The total number of participants were 1087, out of which 564 were female and 522 participants were male who belonged to different levels of programs, including bachelors, masters, and higher education.

The main analysis was done for two groups: pilot (n=219) and traditional (n=684). The results indicated an increase in positive responses for metacognition, autonomous motivation, and coping with emotions. However, the responses for growth mindset decreased from 3.94 to 3.85. In light of these results, it can be deduced that entrepreneurship education has a positive influence on students' assessments of entrepreneurship competence. The slightly negative response for a growth mindset can be explained given the practical experiences and the reality of the situations one might face after entering the field of entrepreneurship.

The means and standard deviations were primarily calculated to measure the influence of EE on students' assessments of entrepreneurship competence. The mean difference between competencies was mostly negative. A negative mean difference shows that after the study, the responses calculated were lower on these competencies, indicating a negative influence on students' assessments of EC, except for metacognition and coping with emotions which are

influenced positively. Summarizing the findings here, EE does influence students' assessments of entrepreneurship competence, and it can be concluded that the influence is rather negative.

As one progresses through the entrepreneurship journey, the approach becomes practical which encourages the individuals to evaluate the courses of action and related consequences. This evaluation may limit certain aspects of the business or the entrepreneurial venture and encourage the individuals to take calculated risks – causing the individuals to set goals which is a step-by-step procedure. This contributes to an increase in autonomous motivation as the individuals look forward to their journey as one step at a time, and further have a firm grip on their emotions. Even if they fail to achieve certain goals in the first attempt, they can always try again and get back on track.

Hence the components that shape the entrepreneurship competence of a student can be summarized as autonomous motivation, growth mindset, coping with emotions, personal initiative, metacognition, creativity and social skills. There are more than one component required for developing entrepreneurship competence and each component holds a significant value in shaping the final version that is characteristic of skills, knowledge and attitude.

The second research question was: How does self-management and other entrepreneurship competencies relate? For this, the Spearman correlation was calculated. It retrieves the values for the correlation coefficient, and the value of p which helps quantify the strength of the relationships present. The correlation values for coping with emotions is indicative of a weak-moderate relationship between self-management and entrepreneurship competence.

From these results it can be deduced that metacognition and autonomous motivation are weakly related with self-management, but growth mindset and coping with emotions have a moderate to strong relationship with self-management. It is important for an entrepreneur to have a growth mindset along with the ability to have firm control over their emotions so that it does not cloud their judgment. Metacognition1 (M1) had a correlation value of 0.377 with communication1 and a value of 0.451 with metacognition2 with indicated a weak to moderate relationship, and highlights that the competences are positively correlated. Likewise, growth mindset1 (GM1) had a correlation value of 0.515 with GM2, indicating a moderate relationship at 99% significance. Creativity 1 (C1) was also correlated with M1 (0.377) and C2 (0.606). Furthermore, the

competences after study showed that values for correlation were between 0.3-0.5 for all. This was reflective of a weak-moderate relationship.

Consistent with this, the correlation values for growth mindset were less than 0.25, indicating neglible relationships or that the competences are not related and do not affect each other. Usually a weak relationship means that changing one variable would not effect the other. In simpler words, metacogtion, and coping with emotions may be seen as separate entities and competences that are weakly related, as they have no significant relationship with each other. It can be concluded that there is a negligible relationship between growth mindset and entrepreneurship competence, which is calculated by accounting for all 14 competences.

Having a clear mind and a clear direction to proceed with is the primary requirement for an entrepreneur which can be significantly improved, enhanced, and built during higher education. Each individual has lived through different experiences which shapes the basic judgement and personality, but the duration in which an individual is enrolled at a higher education institute is more or less similar. It can be leveraged to impart practical skills and mental strength by exposing the students to relevant areas of entrepreneurship. The key is to enable individuals to manage their emotions and their vision.

The third research question was: How do explicit learning experiences contribute to student assessments about entrepreneurship competence?

Explicit learning experiences do not contribute positively to student's assessment about entrepreneurship competence. It acts as an intervention and highlights the weak competences at an early age, which can then be developed by making conscious efforts. The results indicated no significant differences which means that explicit learning experiences which means that explicit learning experiences do not contribute significantly to student's assessments of EC as the responses for the pilot group and the traditional group only indicate a mean difference of 0.03. This further highlighted a minimum contribution of explicit learning experiences. Still, without such explicit experiences, the students may not realize their entrepreneurship potential and at later stages, development of such competences can be challenging.

Summarizing the overall findings of this study, it has been found that explicit learning experiences can have an influence of student's assessments about entrepreneurship competence, and it may or may not be positive. As presented in this study, the piloting assessment group did not respond with a higher agreement rate but instead, the responses were very much similar to the traditional EE group. It goes against the author's expectation, but after reflecting on the findings of this study, the author concludes that by making the learning experiences explicit, students are pushed to the front, and they know exactly how the skills, knowledge and attitude will get them further in life. It may even translate to added pressure given a more realistic picture of entrepreneurship since it is not what we see on social media and in newspapers. This very realistic perspective contributes to shaping and influencing student's assessments about EE.

The two groups also showed no statistically significant differences as identified in section 3.4.

4. CONCLUSION

The author has presented the results and findings of this study. The main objective of this study was to evaluate if higher education imparts a suitable environment for the development of students' entrepreneurship competence.

This research study has summarized the findings of an extensive experiment conducted by the faculty of Tallinn University of Technology to evaluate the impact of explicit learning experiences in EE. This study provides significant points of analysis for the assessment of higher education as a suitable environment for students' entrepreneurship competence development. In Chapter 3, the data analysis and results have been provided to elaborate the influence of EE on student assessments as recorded before and after the study. The results indicate a significant improvement in performance and show that students who were subjected to explicit learning experiences and given a chance to learn via practical experiences.

The results presented in this study are indicative of the fact that by introducing the students to entrepreneurship education and making it explicit, the weaker areas of entrepreneurship competence can be highlighted – it starts with self-management as it is strongly related with one's ability to cope with emotions. That is, the individuals can thrive better in a challenging environment and not let failure be the determinant of their overall journey. This sets the foundation for taking initiative and risks, which is critical for an entrepreneur.

The model utilized in this study was the Estonian Entrepreneurship competence model, that is based on the theories of psychology, education and entrepreneurship. It provided the necessary entrepreneurship competencies that were divided into four categories. The main category of interest was self-management, which included metacognition, growth mindset, autonomous motivation and coping with emotions.

With the results presented in Chapter 3, the author has successfully achieved the research objectives as set out in the beginning. Summarizing the findings in this study in light of the research objectives; The primary components which shape entrepreneurship competence of a student is self-management which relates to; growth mindset, autonomous motivation, coping with emotions and metacognition. The results are indicative of a weak to moderate relationship of the competencies with self-management.

Entrepreneurship education shapes student assessments about entrepreneurship competence by preparing them for real world situations. It equips the students with the necessary skills and relevant practical experiences, regardless of what their individual journey and personal experiences have taught them over the years prior to EE.

Analyzing if explicit learning experience has any impact on student assessments toward entrepreneurship competence, it can be deduced that such an intervention can bring significant changes in terms of attitude, skill, and behavior among the students enrolled. Such learning experiences can codify entrepreneurship competences to design appropriate responses when faced with emotions or challenging times.

Given the immense popularity of entrepreneurship competence, it was essential to investigate the role of higher education and the significance of explicit learning experiences in shaping students' assessments about entrepreneurship competence. The rising globalization and the need for innovative solutions push the demand for entrepreneurship, which is why there is an increasing interest in entrepreneurship and entrepreneurship competence, to be specific the primary role of entrepreneurship education is concerned with the creative skills and innovative talents primarily associated with metacognition, coping with emotions, autonomous motivation, growth mindset, and personal initiative. When it comes to building an ecosystem of multiple levels via diverse knowledge and value systems, the education experience concerning entrepreneurship plays a pivotal role.

This study achieved its objectives with reference to the identification and recognition of the components that shape the entrepreneurship competence of a student. It includes key components related to self-management and constructs of entrepreneurship competence. By evaluating how entrepreneurship education shapes student assessments about entrepreneurship competence, the

higher education can plan interventions, and tailor the course content according to the needs of the students to better fill the gaps. Undoubtedly, higher education is a considerable aspect in one's adult life, and while it shapes most of our experiences, the relevant exposure can be utilized to improve student's assessments about entrepreneurship competence.

The analysis of explicit learning experiences has indicated that the impact on student assessments toward entrepreneurship competence is rather minimal. Hence, practical experience may be given to the students at different levels to see if that has any significant influence on the student's assessments.

In conclusion, this study has identified that the entrepreneurship competence of students is shaped by factors that are not limited to skills, attitudes, and knowledge. It further includes the individual's autonomous motivation, growth mindset, ability to cope with emotions, teh courage to take personal initiative, metacognition, creativity, and social skills. Additionally, explicit learning experiences may contribute positively towards student assessment of entrepreneurship competence. Since it acts as an intervention by highlighting the weak competences at an early age. Hence, if students do not realize their entrepreneurship potential early on, it can be difficult to do so in their adulthood, and chances are individuals may never put in the necessary efforts to enhance their abilities. The author concludes that the explicit learning experiences can contribute positively to self-management, in terms of a growth mindset, but other competences like metacognition, coping with emotions and autonomous motivation may not be related significantly. The overall contribution is rather minimal as seen through the results presented.

Every research study works within a scope, and the aims to meet the objectives which narrows down the focus to set and relevant items. While this guides the research study and helps organize and structure the thoughts and emerging insights from the data, it can also pose certain limitations.

A potential limitation of this study can be summarized as the author's understanding of statistical software and technicalities as the up-gradation of these is a continuous process by the makers or service provides it took a while to get familiar with the working of the new versions of software, the details in analysis and the statistical interpretations, however, at the end of this study, this limitation has been overcome as the analysis and interpretations have been presented.

Other than such technical limitations, the author faced no specific limitations over the course of this study, and the results presented here are close to the ideal study the author had in mind.

However, the advancement of the economies and the increasing dependence on entrepreneurship highlights the significance of self-education. Given that entrepreneurship is the ability to respond to situations by providing a solution, future research may investigate the significance of self-education in this regard and, its relationship with one's entrepreneurship ability. By expanding one's knowledge base, or one's skill set and ability to learn new by its own from different sources and experiances in its surroundings is the solutions proposed can be altered positively, hence; a thorough look into the relationship between entrepreneurship competence and self-management with a different target group, and a different database can be a useful contribution to the field of entrepreneurship.

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APPENDICES

Appendix 1. Correlations among sub competencies (Before study)

	M2	GM2	C2	AM2	PS2	P2	ETS2	C2	PI2	C2	BO2	BE1	FL2
GM2	.11*	1											
C2	.36*	.13*	1										
AM2	.15*	-.11*	.13*	1									
PS2	.53*	.09*	.41*	.17*	1								
P2	.35*	.07	.39*	.19*	.55*	1							
ETS2	.31*	.13*	.35*	.14*	.40*	.40*	1						
C2	.32*	.19*	.40*	.12*	.35*	.34*	.33*	1					
PI2	.37*	.10*	.49*	.13*	.46*	.44*	.38*	.54*	1				
C2	.34*	.19*	.31*	.08*	.34*	.30*	.33*	.46*	.36*	1			
BO2	.37*	.06*	.52*	.13*	.48*	.42*	.42*	.39*	.52*	.30*	1		
BE1	.35*	.08*	.44*	.12*	.43*	.42*	.50*	.33*	.45*	.37*	.56*	1	
FL2	.36*	.06*	.28*	.09*	.48*	.47*	.33*	.29*	.36*	.30*	.43*	.44*	1
CM2	.35*	.15*	.37*	.09*	.40*	.38*	.33*	.46*	.42*	.39*	.40*	.37*	.31*

*p < .05

Note:

M=Metacognition; GM= Growth Mind; C=Creativity; AM= Autonomous Motivation; PS=Problem solving; P=Planning; ETS=Ethical thinking and sustainability; C=Communication; PI= personal initiative; CO=Cooperation; BO= Business opportunity; BE=Business environment; FL=Financial literacy; CE= Coping with emotion

Source: Author's calculations based on the raw dataset (SPSS)

Appendix 2. Correlations among sub competencies (After study)

	M2	GM2	C2	AM 2	PS2	P2	ETS2	C2	PI2	C2	BO2	BE1	FL2
GM2	.11*	1											
C2	.36*	.13*	1										
AM2	.15*	-.11*	.13*	1									
PS2	.53*	.09*	.41*	.17*	1								
P2	.35*	.07	.39*	.19*	.55*	1							
ETS2	.31*	.13*	.35*	.14*	.40*	.40*	1						
C2	.32*	.19*	.40*	.12*	.35*	.34*	.33*	1					
PI2	.37*	.10*	.49*	.13*	.46*	.44*	.38*	.54*	1				
C2	.34*	.19*	.31*	.08*	.34*	.30*	.33*	.46*	.36*	1			
BO2	.37*	.06*	.52*	.13*	.48*	.42*	.42*	.39*	.52*	.30*	1		
BE1	.35*	.08*	.44*	.12*	.43*	.42*	.50*	.33*	.45*	.37*	.56*	1	
FL2	.36*	.06*	.28*	.09*	.48*	.47*	.33*	.29*	.36*	.30*	.43*	.44*	1
CM2	.35*	.15*	.37*	.09*	.40*	.38*	.33*	.46*	.42*	.39*	.40*	.37*	.31*

*p < .05

Note:

M=Metacognition; GM= Growth Mind; C=Creativity; AM= Autonomous Motivation; PS=Problem solving; P=Planning; ETS=Ethical thinking and sustainability; C=Communication; PI= personal initiative; CO=Cooperation; BO= Business opportunity; BE=Business environment; FL=Financial literacy; CE= Coping with emotion

Source: Author's calculations based on the raw dataset (SPSS)

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