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Defining Metacompetencies for Entrepreneurship Education

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TTÜ PRESS

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Declaration:
Hereby I declare that this doctoral thesis, my original investigation and achievement, submitted for the doctoral degree at Tallinn University of Technology has not been submitted for doctoral or equivalent academic degree.

Sirje Ustav

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Metapädevuste määratlemine ettevõtlusõppes

SIRJE USTAV

TTÜ KIRJASTUS

Contents

List of Publications

The list of author's publications, on the basis of which the thesis has been prepared:

I Ustav, S. & Venesaar, U. (2013). The assessment of student metacompetencies in the context of entrepreneurship education. Periodical of Entrepreneurship Education. Vol. 1, 108–127.

II Ustav, S. (2016). How Entrepreneurship Education Can be Developed Knowing the Power of Metacognition. *Research in Economics and Business: Central and Eastern Europe,* Vol. 8, Nr. 2, 85–107.

III Ustav, S. (2018). Exploring the Gaps of Metacompetencies Between Entrepreneurs and Students. *Journal of Enterprising Behaviour*. Vol. 26, Nr. 2, pp. 155–183. DOI: 10.1142/S0218495818500061.

IV Ustav, S. & Venesaar, U. (2018). Bridging Metacompetencies and Entrepreneurship Education. *Education+Training*, Vol. 60, Issue 7/8, pp. 674–695. DOI: 10.1108/ET-08-2017-0117.

Author's Contribution to the Publications

Contribution to the papers in this thesis are:

I This paper focuses on individual differences of metacompetencies and aims to develop an assessment instrument. Designing the study, building the theoretical framework, formulating the research questions, carrying out the data collection and conducting the analysis, while writing the paper as the main author.

II This paper seeks for individual differences of metacognition and knowing the power of metacognition, how to develop entrepreneurship education. Designing the study, carrying out empirical study and interviews with sample of students, conducting the analysis, and writing the paper as the main author.

III This paper interviews practicing entrepreneurs to compare the differences with earlier data from students'. As the author, compiling theoretical overview and designing the study, carrying out the interviews and conducting the analysis, finally discussing the results and establishing future research recommendations.

IV This paper follows students' development, and metacompetencies throughout the semester, looking for connections between metacompetencies and outcomes of entrepreneurship education. As main author, developing a theoretical framework, also empirical study was carried out, and data analysed. Writing the paper as the main author.

Introduction

The employment of graduates is becoming an increasingly prominent economic and social problem and has attracted extensive attention from researchers, who suggest that entrepreneurship education (EE) has a positive influence on entrepreneurial behaviour and employment performance (e.g., Li & Liu, 2011; Martin et al., 2013). A recent empirical study demonstrated that EE programmes provide value both by helping to enable business start-ups and by supporting other career paths through the entrepreneurial knowledge and skill sets graduates acquire during their specialised studies (e.g., Jones, et al., 2017). This has given an impetus to the development of concepts and measures of interpersonal and intrapersonal competencies, which has led to discoveries suggesting strong relationships between academic performance and certain behaviours and habits of mind (Dries & Pepermans, 2007; Pintrich, 2002; Schraw, 1998; Weinert, 2001), competencies that predict success in both school and work settings (Pellegrino & Hilton, 2012). To prepare young people for economic and social changes, it is therefore urgent to focus on individuals' abilities to turn ideas into action through personal qualities and skills, to achieve challenging objectives and to better seize opportunities (European Commission, 2008). Thus, significant effort should be put into researching the models and content of EE as there is a great difference in the meaning and importance given to EE between experts (Fayolle, 2018; Kurczewska et al., 2017; Li & Liu, 2011).

The entrepreneurial learning process relies heavily on the process of entrepreneurship as a sequence of opportunity discovery, evaluation and implementation that involves individuals' active participation in value and business creation (Nielsen et al., 2012, Shane, 2003, Shane & Venkataraman, 2000). Defining entrepreneurship determines a starting point for both the content and purpose of learning as well as the teaching methods and evaluation of EE (Mwasalviba, 2010). Jones and Matlay (2011) pointed to this, critically stating that EE is becoming too oriented towards identifying and executing business opportunities. In entrepreneurship, intention and opportunity recognition belong to pre-establishment phase and are directly connected to establishing a business. Programmes focusing on this narrow and very specific (though important) phase aiming to increase entrepreneurial activity, do not offer any knowledge of or glimpses into the daily process of entrepreneurship to the learner in their everyday- and working life, to support better management in the chosen field (Blenker et al., 2008). Previous research has shown that it is necessary to introduce EE methods that support the personal development of learners, such as creativity, problem solving and planning skills and other competencies supporting entrepreneurial behaviour (Karimi et al., 2014).

The research on multi-dimensional frameworks of competence has established a holistic competence model that covers cognitive, functional and social competencies, while metacompetency is presented as an overarching input that facilitates the acquisition of output competencies, such as cognitive, functional and social dimensions (Le Deist & Wintherton, 2005). Higher order competencies (Baczyriska et al., 2016) or metacompetencies, have been recently incorporated into competence models. These express a framework for defining the skills and knowledge requirements of an occupation. Metacompetencies represent a collection of the requisite skills and the combination of these that jointly define successful job performance (Baczyriska et al., 2016). After McClelland's (1973) competency modelling, the use of competencies to describe the characteristics necessary for effective performance has become increasingly

popular. Since the 1990s, in an effort to develop a competency classification system that characterized the successful manager, the term metacompetency appeared in a variety of conceptualisations in management competence research (e.g., Reynolds & Snell, 1988; Pedler et al., 1994; Buckley et al., 2005). In educational fields, only a few studies are available that consider metacompetencies, such as in the field of social work education (Bogo et al., 2013). EE is perhaps different because it does not focus so much on knowledge but rather on an awareness of entrepreneurial life and practical process, attitudes and interests that direct potential intention towards entrepreneurial action.

Entrepreneurs think and behave in ways that are unique (Corbett et al., 2018) and organisation's capabilities cannot be developed without developing a person's entrepreneurial spirit (Man et al., 2008). To do so, it is recommended to look for metacognition, which has been proposed as an entrepreneurial way of thinking (Mitchell et al., 2005). Originating from educational psychology, metacognition is defined as thinking about one's own thinking process such as study skills, memory capabilities, and the ability to monitor learning (Flavell, 1979) there is, however, little evidence available about the development of students' metacognitive abilities in the field of EE. Research on the full concept of metacompetencies based on a theoretical overview appears to be poor, especially in regard to empirical research. Researchers keep asking how do these enterprising individuals think and act in a productive way (Corbett et al., 2018) and suggest that entrepreneurship research on the cognition, attitudes and behaviours of entrepreneurs still has untapped potential to provide transformative insights into important economic factors.

There is an ongoing need to better understand the linkages between entrepreneurs' emotions, revolutionary thinking and entrepreneurial action (Corbett et al., 2018). Emotions play a significant role in the process of opportunity identification (Shepherd & Patzelt, 2018) and interact with entrepreneurial decisions and actions (Cardon et al., 2012). Together with motivation (Hytti et al., 2010), emotions are key drivers for learning in EE (Kurczewska et al., 2017; Kyrö, 2008), but studies in these areas are scarce, particularly regarding the development of entrepreneurial skills, attributes and behaviours (Kirby, 2004; Phan et al., 2002).

Knowing that competencies, in contrast to personality traits (Brandstätter, 2011), are dimensions of individual differences that are open to training, education and change, scholars have expanded this understanding to the concept of metacognition (Batha & Carroll, 2007; Rahman et al., 2010). This, however, has only been suggested for EE (Mitchell et al., 2007) and has not been expanded to or proposed for metacompetencies. Moreover, research has established that some relatively easy interventions can positively shape students' adoption of entrepreneurial competencies and performance (Dweck et al., 2014; Fayolle & Gailly, 2015; Mitchell et al., 2005; Yeager et al., 2013). At present, EE focusses on the entrepreneurial person who takes responsibility for his or her own future to create a desired reality (Ruohotie & Koiranen, 2000). A later literature review (Nabi et al., 2016) suggested that the impact of EE programmes on attitudes and behaviour is equivocal, and studies on affect (emotions involved in EE) are scarce, as are studies specifying even minimal pedagogical intervention in detail. The work of the aforementioned scholars invites the development of new approaches that go deeper into entrepreneurial cognition and make more inquiries into the entrepreneurial intent-behaviour link. This is supported by recommendations to draw on theories of cognition, emotion and action (Cardon et al., 2012) to understand the connections between thinking, feeling and doing. The need for research on metacompetencies to

serve EE has also been acknowledged (Lackeus, 2012), inviting the development of more contemporary approaches.

This all points to a tripartite model consisting of cognition, affection and conation, which serves as the foundation of this research. The model originates from the work of Rosenberg and Hovland from 1960 and reached towards the assessment of these constructs (Robinson et al., 1991). In 1990s, the model was exploited by Snow (1996) and colleagues to differentiate affection and conation from cognition. For instance, self-regulation, defined as voluntary action management, seems to have become the overarching conative concept (Snow et al., 1996). However, research for long time considered metacompetencies only as a component in a variety of conceptualisations (Ustav & Venesaar, 2018). In EE setting, metacompetencies were first discussed by Kyrö et al. (2011), who followed the tripartite model of cognition, conation and affection and investigated the interaction at a *meta*-level. In parallel to the development of the research in this thesis, Kurczewska et al. (2017) also investigated and advocated for the interplay of cognition, conation and affection in a framework of reflective practice, which also indicates to the confusion around these three constructs in research. They claimed the enhancement of all three metacompetencies is very important in entrepreneurial learning. Even when the theoretical foundation of metacompetencies follows some general understanding, the application and disposition of metacompetencies in EE are completely unexplored (Lackéus, 2013). So, it can be concluded that metacompetencies have been found to be powerful enhancers of basic skills, competencies and promoters of entrepreneurial action but have been conceptualised in a variety of ways with only a few attempts to apply them in EE.

Therefore, the overarching aim of this thesis is to further define the concept of metacompetencies within the domain of EE. For a better understanding of the content of metacompetencies, an assessment tool was developed based on the tripartite construct of metacognition, metaconation and meta-affection and tested among students. The results of the students were compared to a sample of entrepreneurs.

Previous research on the application of the tripartite construct of metacompetencies in EE by Kyrö et al. (2011), the influence of conation on the results of EE by Kurczewska (2013) as well as research on the multiple-way of interplay between cognition, conation and affection (ibid.) have had a great value in bringing the new EE concept into discussion and evaluating how to advance entrepreneurial learning.

This thesis addresses the indicated problems and recommendations, taking an integrative approach to the well-developed literature of educational and social psychology and developments in EE to further develop the concept of metacompetencies within the domain of EE as well as to fill the gap between assessment and practical educational instructions. The research uses iterative but methodologically variable studies to establish empirically grounded knowledge about metacompetencies in the context of EE. The research process involves the exploration and definition of metacompetencies and their components and assessment.

Based on these objectives, this thesis proposes the following research questions:

1. How to define metacompetencies in the context of EE?
2. How to assess metacompetencies?
3. What is the connection between metacompetencies and EE?

The current research is based on a tripartite model of cognition, conation and affection (Snow et al., 1996), which was introduced at a meta-level in the EE context by Kyrö et al. (2011). It is also a continuation of the research made by Ling (2013) whose dissertation focussed on assessment development and took a metacognitive approach in EE. Supporting the call for more creative approaches (Cardon et al., 2012) to explore the multidimensional phenomena of metacompetencies in the field of entrepreneurship, this thesis applied multiple methods to explore, assess, explain and validate the research. To explore the concept on a theoretical basis, a phenomenological approach was applied. Coding procedures were used to turn the qualitative material into measurable units. For an initial explanation of the results, in-depth interviews with students were used, which were also used later for a comparative study with entrepreneurs. Validation and reliability measures were calculated.

Derived from the research questions and process the theoretical contribution to the literature, concluding separate studies or articles includes further development of the concept of metacompetencies (and explaining different statements of metacompetencies) in the context of EE based on students' expressions in different educational settings and using different groups (students and entrepreneurs; Articles 1–4). The thesis contributes to develop an assessment tool for measuring metacompetencies by adding meta-affection and metaconation components. The tool was empirically tested (Article 1). As a result of the use of assessment tool, the interrelation between metacognition, metaconation and meta-affection was confirmed (Articles 1, 4). The connection between metacompetencies and EE demonstrated the impact of interventions on changes in students' attitudes, motivation, emotions, interest and intentions towards entrepreneurship (Article 4).

A practical contribution of the thesis addressed to entrepreneurship educators relies on the operationalisation of the theoretical contribution and involves a presentation of the tools and methods for course design that considers individual and collective activities focussed on the most underdeveloped metacognitive abilities of students for comprehensive development (e.g., discussion and sharing experiences, reflection) in the context of EE (Article 2). This thesis suggested recommendations for the course programmes for the development of metacompetencies that highlight specific aspects of metacompetencies that are in a need of special attention and intervention (Article 3, 4).

Further the research concludes with a brief summarisation of the core content of the research papers that the thesis draws upon:

- Article 1 draws on previous studies, explores the full concept of metacompetencies and develops a new tool for the assessment of students' metacompetencies. Samples of students were differentiated using the tool based on their metacompetencies. This article demonstrates the interrelation between metacognition, meta-affection and metaconation.
- Article 2 aims for a deeper investigation of metacognition, which is already been discussed in the entrepreneurship domain, and an assessment instrument is tested in prior studies. The paper adds an empirical exploration and explains students' differences in metacognitive awareness and abilities. Based on the results of the analysis, specific instructions were designed for interventions that enable the enhancement of metacognition.
- In Article 3, metacompetencies were empirically assessed among practicing entrepreneurs' for the first time. The results of the comparison of metacompetencies between entrepreneurs and the previous student sample

are used to identify the gaps between the two sample groups in order to provide recommendations for EE.

- Article 4 follows students' metacompetencies throughout the full-term entrepreneurship course designed to enhance students' metacompetencies through intervention, embedded in the content of the course and in parallel changes in their attitudes and intentions. Metacompetencies appear to be a solid concept and strongly related to the outcomes of EE. The results of the research showed that enhancing metacompetencies during EE is related to changes in interest, positive attitudes and intentions towards entrepreneurship. Instructions for the integration of metacompetencies into EE are recommended and discussed.

The current research seeks to bring a substantial addition to the earlier findings in this field, confirming the interplay between and importance of considering not only the cognitive but also the conative and affective aspects of learning at meta-level. The thesis builds a broader base to define metacompetencies for EE, adding an assessment tool, entrepreneurs' perspectives and specific instructions for EE course design, summarised in this cover paper.

As the brief introduction above presents, this thesis is structured to be considered in conjunction with the attached articles that form a part of this thesis. Chapter 1 starts with an overview of the theoretical framework, focussing on EE in general and further exploring metacompetencies. Chapter 2 introduces the research design and methodological choices, data collection principles and research process. Chapter 3 provides an introduction to the results according to each article. The last section discusses the research results, presents the author's contribution to science and practice, describes the thesis's limitations and opens questions for future research.

Abbreviations

EE	Entrepreneurship Education
MCOG	Metacognition
MCON	Metaconation
MAFF	Meta-affection
MMA	Measure of Metacognitive Awareness
BDM	Bayesian Dependency Modelling

Explanations of abbreviations used in the thesis—the table.

1 Theoretical framework

1.1 Objectives of entrepreneurship education

Scholars have recognised that EE is not just about how to set up and manage an organisation, but is a new educational philosophy and mode of promoting entrepreneurial talent (Li & Liu, 2011). Constructivist and social constructivist approaches to learning and teaching have become increasingly influential as attention has focussed on how we learn as well as what we learn (Downing, 2010). Research on the EE literature from Mwasalwiba (2010) also indicated the shift of EE from a start-up view to an attitude-changing perspective. Lautenschläger and Haase (2011) suggested focussing on the promotion of entrepreneurial soft skills rather than on teaching how to start a business. They claim that the deficits existing in the entrepreneurial interests and abilities of young people are caused by rationally oriented educational systems, which do not promote creativity, opportunity recognition or problem-solving abilities (Lautenschläger & Haase, 2011). Instead of the more traditional approach, Downing (2010) advocated for a problem-based approach to learning and teaching. At the same time, Foo (2011) claimed that papers tended to focus too much on opportunity identification or evaluation.

More recent empirical evidence from a systematic review on the impact of EE (Nabi et al., 2016) suggested that the impact of EE programmes on attitudes and behaviour is equivocal. Analysing 159 published articles from 2004 to 2016, this group of researchers claimed that looking at subjective outcome measures has a tendency to severely under-describe the actual pedagogies being tested. The same was stressed by Fayolle (2018). Löbler (2006), basing her arguments on similar studies, even suggested that formal education does not foster entrepreneurial competencies but the opposite: it suppresses entrepreneurial attitudes.

There is, however, empirical data suggesting that students value both the enterprising and entrepreneurial skills and knowledge components, discerning their value in their later careers (Jones et al., 2017). Jones et al. (2017) therefore recommended that EE programme designs include both enterprising and entrepreneurial components to meet the future requirements of their graduates. Due to this, educators must evaluate a programme's practices and measure the effectiveness of its graduates in many terms.

With a diversity of target groups, there is a non-alignment between success indicators and what educators and other stakeholders wish to achieve in educating for entrepreneurship with the applied pedagogical approaches (Mwasalwiba, 2010). Klein and Bullock (2006) concluded that it is not generally possible to teach discovery, recognition, decision-making and the nature of the entrepreneurial personality. Blenker et al. (2008) agreed that, so far, universities have not mastered the necessary learning methods, pedagogical processes and frames for EE. On the other hand, they disputed that the present educational system is capable of developing students' motivation, competencies and skills relevant to entrepreneurship. Although distinct, the entrepreneurial mindset is also thought to be learnable and developed by deliberate practice (Baron & Henry, 2010; Mitchell, 2005). Knowing that competencies, in contrast to personality traits, are individual dimensions that are open to training, education and change (Brandstätter, 2011), scholars have expanded this understanding to metacognition (Batha & Carroll, 2007; Rahman et al., 2010). Researchers have proposed various instructional approaches that harness metacognition to improve reasoning

(Kramarski et al. 2002), such as comprehension, connection, strategic thinking and reflection (Mevarech & Kramarski, 2003), to stimulate learners' metacognition. Metacognition has been found to be an entrepreneurial way of thinking (Mitchell, 2007) and a source of adaptability to changing circumstances (Haynie, 2005).

While many specific entrepreneurial competencies have been identified, they generally appear to fall into three major categories: cognitive, social and action-oriented. Stronger competencies in these areas are related to an increased likelihood of engaging in entrepreneurial activity and/or entrepreneurial success (Markman, 2007). Frese's action theory of entrepreneurship described entrepreneurship as a conscious process of establishing goals; planning for goal achievement, monitoring execution; and adjusting for success (Frese, 2007) which by Haynies (2005) categories though represent cognitive domain. These still represent useful competencies in gaining employment in the 21st century economy, an important precursor to entrepreneurship in most instances, as well as in starting a new venture (Boyles, 2012).

The study by Oosterbeek, van Praag and Ijsselstein (2010), however, provided results that are provocative to the earlier discussion. Promoting self-perception surprisingly caused a decrease in the entrepreneurial skill levels of programme participants. The authors found the negative impact worrisome and indicative of the ineffectiveness of the programme. The effectiveness and impact of entrepreneurship courses has been an important avenue in recent research (Fayolle & Gailly, 2015; Nabi et al., 2016) and therefore there has been a call for further research on the impact of university-based EE that pursues up-to-date, empirically rooted, less obvious (yet greatly promising), new or underemphasised directions (Nabi et al., 2016). This includes, for example, the use of novel impact indicators related to emotion and mind-set and a focus on the impact indicators related to the intention-to-behavior transition. The concept of metacompetencies suits these recommendations as a promising new (though not yet obvious) phenomenon for thorough study for EE development.

1.2 From competencies to metacompetencies

Entrepreneurial competencies relate to person-to-person or individual-to-group interactions – for example, building a context of cooperation and trust, using contacts and connections, persuasive ability, communication and interpersonal skill (Man et al., 2002). Competence by the agreement of many scholars, is a set of knowledge, skills and attitudes that is integral and the possession of which means successfully coping within a specific domain. (e.g., Burgoyne, 1988; Lackéus, 2013). But scholars in contemporary literature have started to distinguish between competence and competency. For example Sánchez (2011) and Man et al. (2002) expanded the definition of competence to include psychological and personality traits, attitudes and dispositions that also can be developed. Competency models can be evaluated by the cognitive, creative and emotional development of the learner and whether the focus is set on the individual's overall development (Vaidya, 2014). In educational intervention, it is therefore important to focus on the holistic development of all competencies rather than just specific ones (Rasmussen et al., 2015).

However, there have been few discussions on this topic of integrating behavioural, psychological and emotional aspects with attitudes, skills and knowledge in a scientifically grounded, holistic manner into an EE setting.

Involving metacompetencies, though, offers new opportunities to succeed with this integration (Le Deist & Wintherton, 2005). Metacompetencies make the acquisition of

new competencies and the use of available competencies more adaptive and efficient. The ability to judge the availability, use, compensation and learnability of personal competencies is called metacompetence (Nelson & Narens, 1990) which in their definition refers to knowledge, motivational attributions and volitional skills that allow cognitive resources to be used most efficiently across different tasks, in different content areas and for different purposes. In their work, the basic prerequisite for the acquisition of metacompetencies is the ability to introspective about one's own cognitive processes and products, dealing with and learning from feedback (ibid.). However, the research on metacompetencies has gone in different directions, and though researchers are in agreement of the overarching nature of metacompetencies over general competencies, the conceptual bases vary greatly.

Snow (1996) argued for the intelligence theorists Spearman, Thurstone and Wechsler (See Snow, 1996: 261) advocating for the combination of conative and affective individual differences with cognitive abilities when analysing intellectual performance. Although they used various terms, their central theme can be interpreted as that of metacompetencies in light of contemporary research. The systematic use of metacognitive, motivational and/or behavioural strategies is a key feature of most definitions that describe self-regulated learners (Zimmermann, 1989). In that sense, self-regulation is the closest concept to metacompetencies. When looking deeper into aspects of metacompetencies, one can see that antecedent and partially overlapping theories (Figure 1) perfectly fit in the newly developed, more holistic, tripartite framework of metacompetencies. Self-efficacy beliefs and self-concept are important part of metacognition. Concepts like need of achievement, independence and risk tolerance are in line with metaconative aspects while emotional intelligence relates to meta-affection.

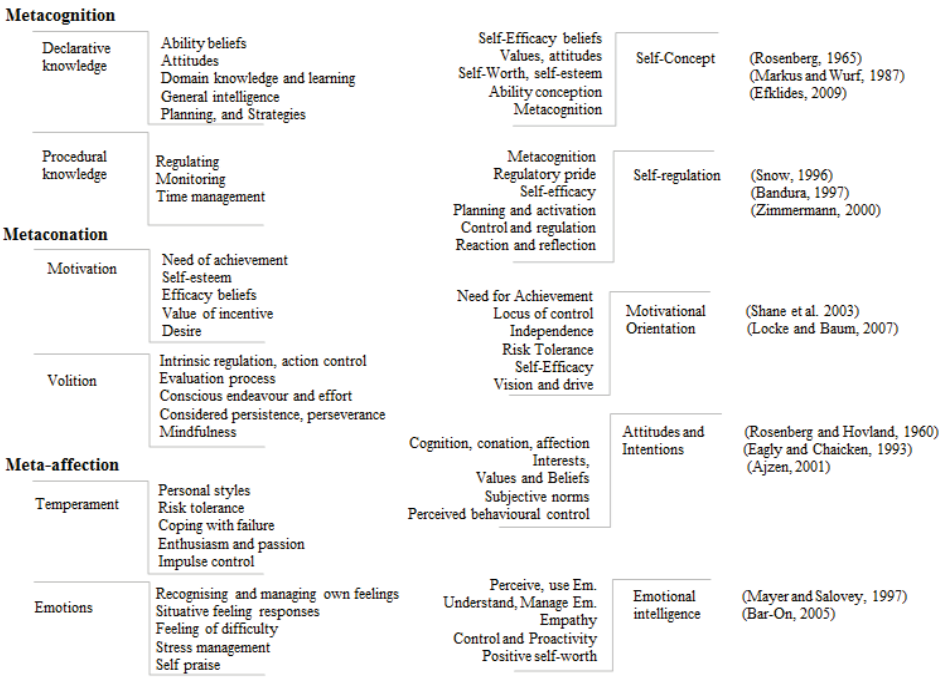

Figure 1. Comparison to relevant concepts in entrepreneurship education compiled by author. Metacompetencies conceptualized based on Kyrö et al. (2011), Ruohotie and Koiranen (2000), Snow et al. (1996).

The theoretical construction of the metacompetency framework does not oppose the seminal theories and concepts that have benefitted the field of entrepreneurship for a long time but giving them place in a new structure. Rather, the concept of metacompetencies reorganises and simplifies voluminous research based on tested and accepted theoretical accomplishments. Valuing the works of respected scholars, but moving in line with more contemporary needs (Lackeus, 2013), scholars in the field recommend further exploration of the concept of metacompetencies in EE (e.g. Kyrö et al., 2011; Kurczewska et al., 2017).

1.2.1 Conceptual development of metacompetency

Earlier, a claim was made about inconsistency of conceptual elaboration of metacompetencies. A wide variety of developments are available (Table 1) from which, for example, managerial and educational orientations can be distinguished. From management perspective, some studies framed meta-qualities (Reynolds & Snell, 1988) in a competency classification system that reflected the qualities of the successful manager (Pedler et al., 1994). The model was later further developed by Buckley, Monks, and McKevitt (2002) who identified fifteen qualities as metacompetencies. On the other hand, Bogo et al. (2013) considered the set of knowledge, skills, and attitudes or values that influence the behaviour of a particular profession as metacompetencies, though this was oriented towards developing a pedagogic framework for medical studies. This approach comes closest to the single concept found in EE by Kyrö et al. (2011) that explores the model of cognition, conation and affection, expressed by students as metacompetencies. This thesis considers this model for further exploration.

Table 1. Conceptualisations of metacompetencies in research.

Educational orientation	Fleming (1991) - Another dimension over competencies - Adaptability - Additional manipulation	Management orientation	Reynolds & Snell (1988), (meta-qualities) - Creativity - Mental agility - Balanced learning skills
	Linstead (1991) - Sensitivity to events - Problem-solving - Social skills - Emotional resilience		Pedler et al (1994) - Creativity - Mental agility - Balanced learning skills
	Haste (2001) - Adaptively assimilate technologies - Deal with ambiguity and diversity - Manage motivation and emotion - Enact moral responsibility		Buckley et al (2002), fifteen qualities, inc: - Relevant professional knowledge - Problem-solving and decision-making; social skills and abilities - Proactivity and creativity
	Kyrö et al (2011) - **Metacognition** - **Metaconation** - **Meta-affection** Base of the dissertation		Tubbs et al (2006), seven areas - Big picture understanding - Attitudes and leadership - Communication - Innovation and creativity - Mental agility - Balanced learning - Self-knowledge
	Bogo et al (2013) - Learning and growth as a professional - Intentional use of self		Le Deist & Winterton (2005) - Cognitive competence - Functional competence - Social competence
	Ustav & Venesaar (2013) - Metacognition - Metaconation - Meta-affection		Norton (2010) - Flexible leadership

Despite the variety of conceptualisations, recent research has been consistent in its fundamental arguments. Metacompetencies are characterised by self-awareness and self-management and involve cognitive, behavioural (or conative) and affective aspects, leading to more effective behaviour in a variety of situations.

1.2.2 Metacognition

Flavell (1979: 906) initially defined metacognition as monitoring of a wide variety of cognitive enterprises through the actions of and interactions among metacognitive knowledge, metacognitive experiences, goals and actions. More specifically, metacognition is a higher-order cognitive process that helps organise people's knowledge and what they recognise about themselves, situations, tasks and environments to enable effective and adaptable cognitive functioning when faced with input from environments that are dynamic and complex (Brown & Eisenhardt, 1997). Metacognition is often seen as a conscious process, also known as metacognitive awareness (Flavell, 1979), ability to reflect upon, understand, and control one's learning (Schraw & Dennison, 1994: 460).

Schraw & Dennison (1994), in addition to planning, monitoring and goal setting, make distinction between declarative, procedural and conditional metacognitive knowledge. Knowledge of tasks relates to understanding the nature of a particular challenge, as well as having knowledge of the solutions to similar tasks that could be implemented for the task at hand. Metacognitive knowledge of strategy entails the procedures one uses to ensure that a particular decision framework is suitable in light of one's goals and metacognitive knowledge of the relevant people and tasks. This refers to procedural and declarative knowledge as different sides of thinking: procedural knowledge emerges together with emotions, motivation and volition whereas declarative knowledge is individual (Kurchewska et al., 2017), and is regarded as the centre of current pedagogic practices. The early works on metacognition as per definition focus on cognitive domain, dealing with motivation and emotions through metacognitive experience (Efklides, 2011). But when practicing reflective thinking, affective arousal often takes place.

Bringing metacognition into entrepreneurial behaviour context, externally focused metacognitive knowledge refers to understanding what other individuals, such as potential customers, competitors and investors, think about a firm and the environment. Internally focussed metacognitive knowledge refers to understanding and acknowledging one's own biases, values and intellectual strengths and weaknesses. Therefore, in EE, metacognition has caused interest for a while (e.g., Haynie, 2005; Mitchell et al., 2005; Haynie et al., 2010). The MMA (measure of metacognitive abilities) assessment instrument is developed for the use in entrepreneurship context (Haynie, 2005) and has been adjusted for student assessment in EE (Ling et al., 2013).

Still, the effectiveness of metacognition (monitoring and control) presupposes the operation of many general person characteristics like ability, cognitive, metacognitive, affective, motivational and volitional characteristics that operate across tasks and situations (Efklides, 2011).

1.2.3 Metaconation

Based on Snow (1996), metaconation is an understudied phenomenon. It roughly consists of two major constructs: motivation and volition. Pre-decisional needs and processes that underlie the formation of goals, decisions and intentions to act correspond to metaconation's motivational aspect, whereas the processes of enactment, the perseverance and protection of the intention-action relation, belong to the volitional component (Ruohotie & Koiranen, 2000). This corresponds to earlier discussion of procedural metacognitive knowledge. Moreover, including impulse, desire and

purposive striving, metaconation overlaps with other well-known concepts like locus of control, independency, need for achievement and risk-tolerance (Hisrich & Peters, 1989).

Scholars are recognising that understanding motivation – the link between ideas and action – is critical for understanding the entrepreneurial process (Carsrud & Brännback, 2011). Studies of entrepreneurial motivation have presented several factors that influence individuals' willingness to act in an entrepreneurial way. For example, Shane et al. (2012) highlighted risk-taking propensity, goal setting and drive as primary motivators for entrepreneurs. The literature on motivation provides a large body of evidence linking tasks that fulfil needs for competence with individuals' motivation to complete those tasks (Vallerand & Reid, 1984): excitement, for example, often motivates people to take action immediately (Russel, 1980).

Based on psychological research, it appears that measuring a person's intent towards an activity is the best predictor of that specific future activity occurring. Various action controls and strategies fall under the heading of volition, including self-regulatory strategies and mindful investment in learning. Kurczewska (2013), thoroughly studied conation in EE setting and confirmed that students possess increased engagement, motivation and volition. The value of this study is that it put students in the middle of an entrepreneurial activity where engagement occurred. Moreover, when discussing breaking patterns, moving students to new self-constructs and consciously developing the entrepreneurial self (ibid.), an assumption of a meta-level process can be made.

Riggs and Gholar (2009) stated that metaconation is not a complicated concept. In the concept of metaconation, they incorporated ethical actions directed toward achieving the highest good and becoming the best or highest self, arguing that metaconation involves moral courage. In spite of the agreement among researchers that conation and metaconation are unique parts of the same whole, there is a lack of empirical knowledge about how metaconation develops or can be developed. It appears that motivation seems to influence volition (Snow et al., 1996), and it is claimed that motivation is intimately linked with affection (Cardon et al., 2009). Getting deeper access to meta-affective processes seems to be the key toward influencing the conative construct, which is, in turn, the key to stimulating intention (Kyrö et al., 2011).

1.2.4 Meta-affection

Despite the progress in studies on how affective events influence entrepreneurial behaviour, most work in this area has dealt with either the early or late stages of a business. Papers examining the early stages of a business tend to focus on opportunity identification or evaluation (e.g., Foo, 2011). A frequent point made by these authors is that affect influences cognition, and since cognition has been shown to predict opportunity identification and evaluation, it stands to reason that affect should also shape these opportunity processes (Baron & Tang, 2011; Foo, 2011). Similarly, a study by Frese and Gielnik (2011) suggested that entrepreneurial action lead to passion rather than passion leading to action. So it would be interesting to examine how emotions influence the whole entrepreneurial process, particularly what happens 'in the middle' – between opportunity identification and execution – not least because the gestation of a new venture can take several years (Carter et al., 1996). What individual traits, characteristics, behaviours or experiences help entrepreneurs through this process, and how does the emotional journey of entrepreneurship unfold?

Entrepreneurial emotion refers to the affect, emotions, moods and/or feelings of individuals or a collective that are antecedent to, concurrent with and/or a consequence of the entrepreneurial process, meaning the recognition or creation, evaluation, reformulation or exploitation of a possible opportunity (Cardon, et al., 2012). We have, however, barely begun to uncover the most interesting questions concerning entrepreneurial emotion, much less begun to develop theories to address these questions and examine them empirically. Emotions obviously interact with entrepreneurial decisions and actions (Cardon et al., 2012), and studies have shown, for example, that entrepreneurs tend to experience fewer negative emotions than non-entrepreneurs (Patzelt & Shepherd, 2011). Conclusively it can be stated that emotional-affectional aspects have importance in entrepreneurial practice and learning process. Georghiades (2014) proposed that processes defined as meta-affection are directly initiated or controlled by cognitive mechanisms. He also stated that all metaconcepts depend on cognition. Kyrö et al. (2011) found that meta-affection empowers the reflection of conation, which consequently enhances entrepreneurial and enterprising behaviour. However, they also found it very hard to advance the reflection of meta-affection. As the affective construct at a deeper level relates to values and attitudes that guide the willingness and interest to learn (Kyrö et al., 2011), the affective construct is fundamental to learning and action.

In this thesis, meta-affection refers to the awareness of one's own emotional states, mindfulness in different situations and intrinsic regulation and evaluation processes. Affection subcomponents include dispositional affect (personality aspects that are more stable), specific emotions (intense and short-term) and moods (low intensity but lasting), that result from stimuli (Shepherd & Patzelt, 2018).

1.2.5 Theoretical model for research

Metacompetencies are crucial to coping with changing situations of entrepreneurship and should be considered when planning a syllabus (Buckingham & Deakin, 2012). It is recommended that learning achievement be facilitated by observing expert entrepreneurs' attitudes, values and beliefs (e.g. Fayolle & Gailly, 2015; Kyrö et al., 2011; Gibb, 2008) that reflect metacognitive abilities. Metacompetencies show that adaptive assimilation and dealing with ambiguity and diversity (Haste, 2001), generally suggested as higher-order acumen, are a prerequisite for all other skills and competencies (Tubbs & Schultz, 2006; Brown, 1993) to have an effect.

Therefore, metacompetencies are recommended here as transferable competencies embedded in EE that are associated with skilful learning in diverse contexts (Figure 2).

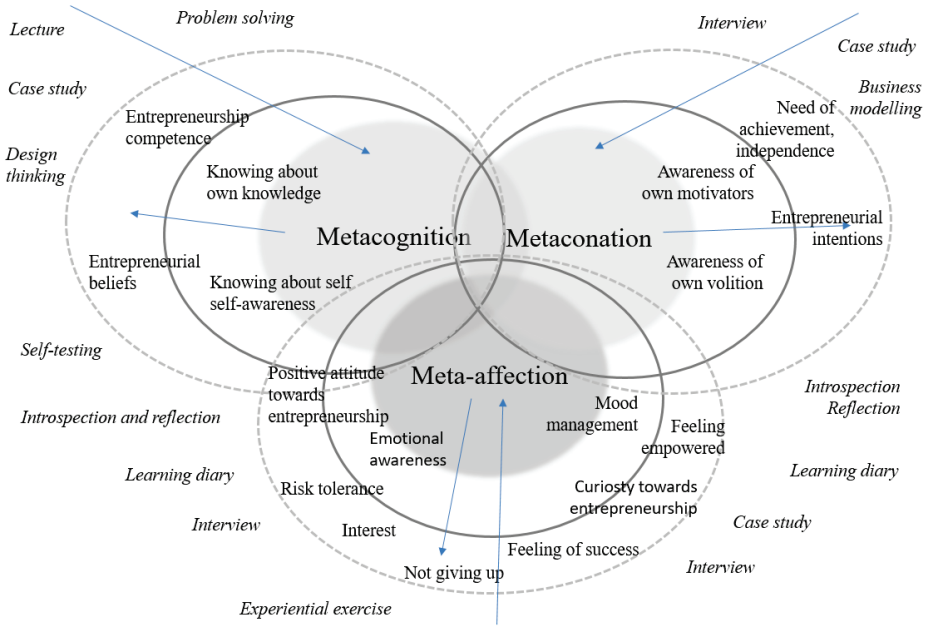

Figure 2. Model for integrating metacompetencies into entrepreneurship education. Source: Author

Metacompetencies and their three components (metacognition, metaconation and meta-affection) constitute the core of the current theoretical research model expressing humans' self-consciousness about knowledge, awareness of motivation, volition and emotions to consciously direct own learning and future.

The model aims to demonstrate how metacompetencies can be placed within the EE setting and exploited. The model is built up on three layers:

- Metacompetencies: The interplay between metacognition, metaconation and meta-affection may partially overlap. For example, monitoring is a conscious checking of procedural steps and cognitive constructs, and, on the other hand, it consists of reflecting on conscious volitional consistency or persistence.
- Entrepreneurial learning objectives: These involve attitude, interest and intention and propose a holistic model that demonstrates how metacompetency subcomponents interact in the learning process. For example, thinking of one's own thinking (metacognition) results in becoming aware of one's own attitudes towards entrepreneurship.
- Tools and methods: The model also proposes tools and methods for the enhancement of each subcomponent. It must be noted that the model mentions tools (e.g., learning diary, interview, business modelling) to be used for an intervention designed around the current research, but they are flexible in the model proposing that different tools can be used. This is because there is no single tool that could not be replaced with another that has similar effect. The tools and methods here, however, are drawn from recommendations from previous research on EE.

The research, bringing together the theoretical and empirical specification of metacompetencies in connection to EE, assessment and pedagogical intervention, is complex and methodologically challenging. The model well relates to Löbler's (2006: 21) questions: 'What is the goal of learning process; how is the content embedded in the learning process; what is the role of learner, teacher?' With these questions in mind, she posits that there is a demand for a new or even different EE approach/paradigm, where we think that the constructivist view can serve as a theoretical underpinning.

2 Methodology

2.1 Philosophical considerations

Philosophical assumptions behind the methodological choices taken for this research stem from the complexity of the phenomenon of metacompetencies set in the framework of entrepreneurial learning activity. According to Kyrö (2015), entrepreneurship education is closest to pragmatic school of philosophic thought. Indeed, the pragmatic approach is known as an approach in which the original vague theories direct the research efforts striving for better understanding of phenomena giving the priority to an individual's action (ibid.). However, as Fayolle (2013) suggests, answering the 'why' question assumes a more profound understanding of the philosophical bases we rely on. This equally concerns the 'how' question. The more in the context of this research, which seeks understanding of the process of construction of metacompetencies, the formation of constructions in and on particular social situations.

Learning is individual and social phenomenon. Searching for a deeper qualitative insight into an individual as a reflective learner in the EE context, sets the thesis to look at the paradigm of social constructivism. Vygotsky (1978) suggests because knowledge is actively constructed by the learner, learning also depends to a significant extent on the learner's internal drive to understand and promote the learning process. Helga Löbler (2006:20) describes: 'Surprisingly or not, if we look carefully at children under the age of five or six we find several entrepreneurial competencies to start a creative destruction. They are motivated to learn, they are interested in many different topics, they do not care about conventions, they ask excellent questions, they discover exciting things, they are impatient and so on. Then they go to school and seem to unlearn these competencies'. This is exactly what this thesis is concerned about – how to (re)establish the educational environment for such a learning; what happens with emotions, motivation, attitudes, interest and intention, when bringing back the introspective awareness and curiosity to the classroom, in the form of metacompetencies.

The epistemological basis for social-constructivist study perspectives is interpretativism (Kroll & LaBoskey, 1996), where knowledge is believed to be acquired through involvement with content instead of imitation or repetition. There is no absolute knowledge, just our interpretation of it, constructing the meaning by building on previous knowledge and experience. New ideas and experiences are matched against existing knowledge, and the learner constructs new or adapted rules to make sense of the world (ibid.). Undergoing an activity is a good starting point for creating experience and a basis for reflection.

Consequently, the research will gather and rely on much of reflective material. But considering the complexity of the research tasks in answering to the research questions, the methodological choices and study process are correspondingly complex, discussed further more closely.

2.2 Methodological choices and research process

Throughout this thesis, the essence and the empirical and theoretical ground of metacompetencies is under study. Both phenomenography and phenomenology share the root *phenomenon,* borrowed from Greek about what is experienced is the basis of reality (Marton, 1981). Phenomenography, with the suffix graph (*graphos*), denotes a research approach that aims to describe the different ways a group of people understands a phenomenon, whereas phenomenology, with the suffix *logos*, aims to clarify the structure and meaning of a phenomenon (Giorgi, 1997). Phenomenography leads to a better understanding of the perceptions and experiences of a phenomenon, while phenomenology will lead to a better understanding of the phenomenon itself. To explore the phenomenon of metacompetencies, a phenomenological approach was the core methodological approach chosen.

The goal of phenomenological research approach is to maximise the depth of the information collected, and therefore, less-structured interviews, diaries and other personal texts are most effective. Qualitative methods add depth and explanatory power to research but can produce large amounts of complex data even with small samples (Henry et al., 2016), especially with the goal is to develop themes that can be used to describe the experience from the perspective of those that lived it (Moustakas, 1994). Methods and techniques allowing a more integrative qualitative and quantitative analysis were therefore used. By clustering groups of participants with similar profiles of codes in quantitative analysis, a cluster analysis can serve as a key component in mixed-methods research (Henry et al., 2016). In this thesis, the goal of performing a cluster analysis is to sort different objects (in this case, students), into groups. The degree of association between two objects is high if they belong to the same group and low if they belong to different groups. Investigating these patterns helps to distinguish and outline new structures, giving significant meaning to the data.

This thesis looks for several interactions. First of all, it looks for the connections and interaction between the three subcomponents of metacompetency (metacognition, metaconation and meta-affection) - but second, it also looks for interactions between metacompetencies and learning process elements. For the assessment of metacompetencies, few tools are available for metacognition. An original instrument (the MMA; Haynie, 2005) was adjusted for use with students in a university setting (Ling et al., 2013). For further development of the assessment instrument for metacompetencies, the EAO (Entrepreneurial Attitude Orientation) scale from Robinson et al. (1991), was also carefully studied. The EAO measures the personal variables this research looks for. It contains four subscales, each of which consists of three components: affect, cognition, and conation. But this scale was originally designed to serve management studies. Analysing the statements towards theoretical propositions, those suitable for students were used for a pilot study. The new instrument includes statements for metacognition from MMA, and adjusted statements for metaconation and meta-affection were derived from EAO (Ustav & Venesaar, 2013). Further validation process of the scale should be additionally undertaken in spite of its theoretically acceptable factors.

2.3 Intervention

Embedding metacompetencies into EE setting, to involve all subcomponents, at the same time keeping the design based on pragmatic and social-constructivist principles, requires careful planning from the educator. The course was aimed to increase students' awareness of the phenomenon of entrepreneurship and at the same time enhancing students' metacompetencies.

Teaching methods promote creative and abstract thinking, reflection, interaction and self-awareness when put into active position of *entrepreneurial shoes*. Self-awareness was promoted with tools like interactive role play, psychological tests, learning diary and different social settings. Students had an opportunity to choose between few tasks. Planned intervention was part of the last study, therefore more thorough description is given in Article 4.

2.4 Data and method

To study metacompetencies in the EE framework, the chosen participants for the research were students in three studies and entrepreneurs in one.

The student samples included all students who declared a full-term course on entrepreneurship. The courses were obligatory in the students' syllabus regardless of their major and therefore represented a variety of attitudes, prior experience and motivation towards entrepreneurship and the course, which is important to avoid self-selection bias (Fayolle & Gailly, 2015). To ensure maximum diversity, the sampling involved international students. In the maximum case, 33 different nationalities and cultural backgrounds were involved.

The sample of entrepreneurs was made using snowball sampling, requiring a minimum three years of experience in entrepreneurial activity, and similarly to the student samples, the inclusion of international background. The specific samples in the research were as follows:

- Article 1 piloted the developed instrument on a new sample of 98 international students. Although rather small in size, the sample gave valid results and reliability measures.
- Article 2, the survey, involved 190 international students for qualitative measurement of their metacognition through the MMA, while 5 students from the sample also provided in-depth interviews, which greatly helped in explaining the results.
- Article 3 explored metacompetencies as reflected by entrepreneurs. Qualitative, in-depth interviewing involved 30 small business entrepreneurs representing a variety of nationalities and industries.
- Article 4 was a complex mixed-methodology research project using both qualitative and quantitative tools. A new sample of 99 international students was established who wrote learning diaries during the full-term course.

The samples are described in detail in the papers comprising this thesis. In conclusion, it can be said that besides the methodological replication, the rigour of research was additionally established by applying a new sample for each study and using varying methods, which provides replicative, comparable results for confirmation. This provided a foundation for the argument and established a solid theoretical concept of the metacompetencies with rich empirical explanatory and instructive data.

Statistical analysis was used in this thesis in many respects. Once a clearly defined structure emerges from the dataset at hand, combining multiple methods can confirm the accuracy of the proposed cluster solutions and patterns revealed from the data analysis performed based upon the phenomenological approach. Bayesian networks are graphical representations of a multivariate joint probability distribution that exploit the dependency structure of distributions to describe them in a compact and natural manner (Friedman & Koller, 2003). In the multivariate domain, analysing the dependency structure of the underlying distribution by Bayesian dependency modelling can establish whether two or more variables are in direct interaction. According to Tirri (1999), Bayesian approaches are ideal for educational setting, producing small data sets with many measured issues and an emphasis on hierarchical models. With similar types of variables, Nokelainen and Tirri (2007) successfully adopted Bayesian technique when studying School principals' self-awareness and self-management.

Furthermore, reliability is an important construct when establishing the validity of the inferences one makes based on scores from tests and all kinds of measures (Gadermann et al., 2012). Likert-type responses are commonly used for measurements in the social sciences. The assessment instruments of the studies within this thesis, but also the qualitative data quantified here, rely on Likert-type scaling, which enables statistical evaluation of a wide variety of variables, including demographic variables. The SPSS software program was routinely used to calculate clusters, factors, Cronbach's alpha and Pearson's covariance coefficient to determine the validity and reliability of this research. This is in line with Gadermann et al. (2012), who recommended the use of correlation-based versions of reliability coefficients for Likert-type or mixed items, which suits current thinking in the psychometric literature.

All of these methods and principles were applied with care and success in the respective papers. The following summarises the research and methodological developments of each paper:

- Article 1: The strong and weak aspects of metacognition were statistically established using the survey instrument. Five additional in-depth interviews provided explanations and reasoning for the quantitative results.
- Article 2: The instrument developed to assess metacompetencies appeared to be valid and was supported by strong factors. A cluster analysis differentiated students into higher- and lower-score groups.
- Article 3: An analysis of in-depth interviews with entrepreneurs gave a rich picture reflecting entrepreneurs' metacompetencies. Comparing the results to similar results drawn from the student sample, important gaps between the two sample groups for both entrepreneurship scholars and educators were identified and presented.
- Article 4: The qualitative data from the reflections was coded into a four- point Likert-type scale. This process appears to have been successful and resulted in a reliable Bayesian dependency model outcome. The three factors of the metacompetencies were strongly correlated ($r < 0.7$), with Cronbach's $\alpha = 0.86$.

The methodological choices were justified, ensuring the results have high reliability and validity, serving the aim of the research and providing answers to the research questions.

3 Results

3.1 The assessment of student metacompetence in the context of entrepreneurship education

Drawing on from the objective of defining metacompetencies for EE, the aim of this study is to further develop the survey instrument for the assessment of metacompetencies (including metacognition, meta-affection and metaconation) in the context of EE. The development of a new measurement tool is in the core of this research. Towards this goal, further exploration into and student differentiation based on metacompetencies was planned. The theoretical grounds of this paper rely on the framework that metacompetencies are essential to entrepreneurial/enterprising behaviour (Kyrö et al, 2011). It was also argued that learning depends on the learner's ability to manage all three meta-level abilities of self-regulation: cognitive, conative (Kyrö et al., 2012). In order to enhance these meta-level abilities or metacompetencies, it is necessary to delve deeper into the interrelations between those competencies to see how they occur in the learning process within the EE domain and how to assess them. In the thesis, the current value of the metacompetencies that students evolved were identified, and it was determined whether there are aspects of metacompetencies that can be developed through entrepreneurship courses.

The task was facilitated by theory development in the form of a tripartite model consisting of cognition, affection and conation as the basis of this thesis's research design, operationalised in entrepreneurship domain by Ruohotie and Koiranen (2000), and assessed in management (Robinson et al., 1991) as studied at meta-levels. Modifying the MMA – used to assess metacognition originally (Haynie, 2005; developed further by Ling et al., 2013) – in a way grounded by theory, a factor analysis provided 26 new statements for metaconation and meta-affection. The accepted factor loadings were 0.3–0.8.

The survey results confirmed that created self-evaluation instrument was valid. Statistical clustering analysis likewise revealed that the first section yielded two separate clusters, differentiating students with lower scores (N = 47), and higher scores (N = 51). While the first study of this thesis claimed that students with higher scores in one component of metacognition would likely have higher scores in all other components, this study expanded the pattern to the full phenomenon of metacompetencies: higher or lower scores (whether in metacognition, metaconation or meta-affection) indicate a similarity in the pattern. If this is so, measuring one component of metacompetency should be sufficient. However, like metacognition, when investigating the full concept of metacompetency in detail, areas of stronger and weaker aspects become visible. Students' metaconative strengths can include self-confidence in their own effort and willpower if they want to achieve something (motivation) and an awareness of making conscious effort when needed, especially when interest is available. As shortcomings, an awareness of giving up when confronted with difficult tasks or not even starting seems to be probable behaviours for many students.

When analysing the results of the meta-affective components, feeling proud of one's own achievements is a positive drive, particularly when the value and meaningfulness of tasks is evident. Overcoming situational moods, like feelings of difficulty or inconvenience with unattractive tasks, are problematic areas with significantly lower means.

As for the general concept of metacompetencies, additional statistical analysis shows that the mean values gender wise were no different in regard to gender. The only aspect where female evaluations (61%) were much lower than male (73%) was the following statement reflecting metacognitive experience: 'I try to break problems down into smaller components', which suggests that female students tend to see more details in the tasks at hand.

Besides verifying that metacompetencies can be measured, the results substantiated the concept that an awareness of strengths and weaknesses can help balance student development in EE.

Summarising the findings of the study, it can be stated that:

- the model of metacompetencies (metacognition, metaconation and meta-affection) is valid and interdependent;
- an instrument for measuring metacompetencies has been created;
- strong and weak aspects appear in all components of metacompetencies (e.g., personal fears, effort level in the face of difficult tasks); and
- metacompetencies are not connected to demographic variables.

This study contributes to the theoretical establishment of metacompetencies by building on a tripartite model consisting of metacognition, meta-affection and metaconation alongside previous studies on metacompetencies. This research supports the notion that in the learning process, we cannot set a preference for cognition. Learning is indeed an integrated function of thinking, feeling, perceiving and behaving in tight interaction and overlapping areas induced by educators.

3.2 How entrepreneurship education can be developed knowing the power of metacognition

Metacognition has received attention from scholars, and, in the context of EE, metacognition is proposed to be a basis for entrepreneurial thinking and decision-making (Mitchell et al., 2005). On this point, researchers have pointed out that the relationship between learning approaches and the development of metacognitive abilities in students is in need of further elaboration (Urban, 2012; Vos & de Graaf, 2004). It has also been concluded that recommendations for the development of metacognition in EE are missing (Urban, 2012). Based on this gap, the current research aims to empirically identify how to embed the development of metacognition within EE. This empirical research consists of quantitative and qualitative methods. First, metacognitive abilities were assessed using the MMA (Haynie, 2005), which was further modified in consideration of the context EE (by Ling et al., 2013, 2015). A survey, distributed among 190 students, distinguished students into clusters with different levels of metacognitive abilities, including students with the strongest and weakest scores in metacognition. Second, in-depth interview with a few randomly selected students from the sample were carried out in order to retrieve explicit information related to those statements that scored lowest in the MMA.

Since Flavell (1979), we have a quite clear understanding that students can be differentiated on the basis of their metacognitive abilities. This study confirmed the general pattern but contributes the finding that students with higher scores in one component of metacognition also have greater means in other components and vice versa. Moreover, even students representing the cluster of strong metacognitive ability possessed the same weaknesses that the additional interviews pointed out. The

interviews also provided an explanation for this, as the students admitted to having general goals in mind and aiming to achieve them, although it turns out that this was not an entirely conscious or controlled process. The students completed required tasks without giving too much taught to why or how. The additional value of this research comes also from the comparison of specific aspects of metacognition, allowing a better understanding of the different educational development needs. This analysis, therefore, revealed interesting results and contributed to our understanding of connections between metacognition and educational settings:

- There are measurable individual differences in metacognition; students either had strong or weak scores in their metacognitive abilities through subcomponents.
- An explanation for the specific strongest and weakest metacognitive aspects is that all students set targets, but these targets are only meaningful for those with strong metacognitive scores. Those with weak scores focus their efforts on results' or something similar which leads to underdevelopment of own potential and learning.
- Metacognition can be enhanced through entrepreneurship education.

An awareness of students' metacognitive shortcomings enables educators to compile tools for interventions to address those weaknesses and ensure balanced development. Based on the results of empirical research from both the current study and earlier research proposing different general strategies for metacognitive intervention (e.g., Schraw, 1998; Veenman et al., 2009; Downing et al., 2008; Sandi-Urena et al., 2011), practical recommendations are provided in the thesis for how metacognitive abilities can be developed systematically through EE. The multidimensionality of metacognition indicates that a single tool or method is not sufficient. Course design should include a variety of tasks for individual and collective activities (e.g., discussion and sharing experiences, reflection and debates) for the development of metacompetencies.

Although this research did not plan to go any deeper in showing the connection between metacognition and motivation (or emotional aspects), the interviews clearly indicated that metacognition does not function in isolation from emotional and motivational aspects.

3.3 Exploring metacompetency gaps between entrepreneurs and students

After the solid conceptual establishment of metacompetencies and studying students in two different samples, the objective of the third study was to add the perspective from the field of entrepreneurship to understand how metacompetencies are reflected in practice by active entrepreneurs. The problem is that to the knowledge of author, there is no empirical data demonstrating how the theoretical construct of metacompetencies is practically used in entrepreneurship and whether metacompetencies differ when comparing groups of entrepreneurs and students. The latter is important for providing objective information for entrepreneurship educators.

The theoretical rationale for this research is based on the tripartite model (Ruohotie & Koiranen, 2000) and it's conceptual form of metacompetencies (Kyrö et al., 2011). The study is exploratory and interpretative in nature using a phenomenological qualitative research design. The research data in this paper was drawn from 30 in-depth interviews with randomly-selected active entrepreneurs from different European small enterprises,

and a variety of industries. The results are analysed and discussed in order to demonstrate the difference between students' and practitioners' metacompetency areas to provide objective information to entrepreneurship educators.

This investigation resulted in interesting patterns demonstrating that metacognition, metaconation and meta-affection are all in active use in various directions, while the most frequent pattern is metacognition–metaconation, for instance, 'We try to ensure our retirement [awareness of cognition] so we can live freely and in peace [awareness of intrinsic motivation or metaconation]'. A comparison of similar results from entrepreneurs and students revealed very specific gaps between the two sample groups that are relevant for EE:

- Lack of awareness of procedural knowledge
- Lack of awareness of one's own (intrinsic) motivation
- Lack of awareness of one's own affective, temperamental reactions

This means that students show strength in the metacognitive areas of declarative knowledge but are significantly less expressive in the procedural aspects. Student motivational expressions also yielded rather poor results compared to entrepreneurs, while their volitional strength was equally well reflected. Not surprisingly, there was also a gap in meta-affective reflections. When comparing students to entrepreneurs who were more balanced in all metacompetency components, students tended to be more mood-orientated, with less awareness of own emotional patterns or temperamental reactions. This is valuable input for EE.

This study provides practical pedagogical advice for how to address these gaps in EE to support students' balanced development. Summarising the findings of the third study,

- entrepreneurs possess a rich repertoire of metacompetencies;
- entrepreneurs' use of metacompetencies reflect a pattern of primary situations where the subcomponents are employed; and
- there are relevant gaps between entrepreneurs and students in using metacompetencies, which educators need to address.

In conclusion, the study contributes to the literature by providing empirical evidence that demonstrates how metacompetencies interact within practice and are used by active entrepreneurs. Second, the results confirm the conceptualisation of metacompetencies and ameliorate the indicated shortage of theoretical discussion of meta-processes, specified here as metacompetencies, in the entrepreneurship field. And finally, a practical contribution is addressed to entrepreneurship educators by identifying the metacompetency areas in need of special attention and intervention.

3.4 Bridging metacompetencies and entrepreneurship education

This final study of the thesis integrates the newly validated concept of metacompetencies into practice to provide an empirical understanding of how metacompetencies are reflected in learning situations and affect educational outcomes in the EE setting under an awareness-focussed course design. In EE, metacompetencies were conceptualised by Kyrö et al. (2011) as the interplay between subcomponents of metacognition, metaconation and meta-affection. This tripartite model has been found to be the best predictor of behaviour in myriad studies (e.g., Rosenberg & Hovland, 1960; Hilgard, 1980; Snow et al., 1996; Ruohotie & Koiranen, 2000). Predicting behaviour is at the core of EE research, such as in the theory of planned behaviour (Ajzen, 1991) or in assessments of entrepreneurial intentions (Linan & Chen, 2009). Metacompetencies are

expected to lead change in the latter, so it is interesting to observe how positive impacts to metacompetencies can be delivered in EE.

Metacompetencies are crucial in coping with changing entrepreneurship situations and should be considered in syllabus planning (Buckingham & Deakin, 2012). Discussions about metacompetencies in the scholarly literature of management and education indicate that they have a higher-order acumen, which is a prerequisite for developing all other skills and competencies (Tubbs & Schultz, 2006; Haste, 2001; Brown, 1993) and for promoting entrepreneurial learning (Kyrö et al., 2011). The main purpose of entrepreneurship programs was initially to prepare students to start their own businesses (Garavan & O'Cinneide, 1994), but also to promote employability (Pittaway & Cope, 2007). Understanding how students learn entrepreneurism (Fayolle & Gailly, 2008) or manage their development under changing circumstances (Haynie et al., 2010; Moberg, 2013) is the focus and challenge of today's EE.

This study was the most methodologically complex, aiming to explore the concept of metacompetencies in students' learning processes with entrepreneurship course objectives. Therefore, the study design was multi-dimensional, and required mixed methods to convert students' reflective statements into measurable categories with small samples for statistical assessment. Student reflections before, during and after the course were successfully coded after phenomenological screening for expressions reflecting metacompetencies. A statistical analysis of the coded results revealed that a majority of students had metacognitive expressions (69% of students) that reflected an awareness of their own beliefs and attitudes about entrepreneurship while also demonstrating changes in thinking during the course. Metaconative expressions (53%) reflected the awareness of students' own motives to study entrepreneurship, how much effort they were willing to invest as well as reflections about their own entrepreneurial behaviour. Meta-affective reflections (60%) revealed the fears they had before taking the course of stydying an unknown (and different from own study subject) domain.

A Bayesian dependency model provided a visual model where metacompetencies were clearly connected to the course's learning outcomes: changes in entrepreneurial attitudes, interest and intention. At the same time, with a new sample and methodology in use, no dependencies are declared between metacompetencies and demographic variables, prior knowledge or access to entrepreneurial activity.

The construct of metacompetencies showed very strong interdependency, situating the tripartite model in the system of the study. A set of interventions focussed on students' awareness creation (self-awareness and awareness of entrepreneurship, changes in students' attitudes, motivations to study entrepreneurship and emotional states) was assessed and attached to the model of metacompetencies. An interesting additional finding appears to be the factor of participation. As the model can be interpreted both ways (i.e., without claiming the direction of causality), participation can cause interest, which facilitates a change in emotions, motivation and attitudes; interest can promote participation; or both.

This study is provided with reliability measures. The Pearson correlation matrix confirmed that the constructs of the model under study have a significant (0.01) positive correlation, while the correlation between metacognition, metaconation and meta-affection was $r = 0.7$. The research model of integrating metacompetencies into EE (Figure 2) also presented a high validity, $\alpha = 0.83$ for the general research model, and $\alpha = 0.86$ for the tripartite model of metacompetency. Based on the results, a model positioning metacompetencies in EE (Figure 3) was drafted. This study relied on a

pre-planned course design where the development of metacompetencies was at the core. Having found a positive change in attitudes, interest and intentions towards entrepreneurship as a result, the model for EE can be proposed as an outcome of this study.

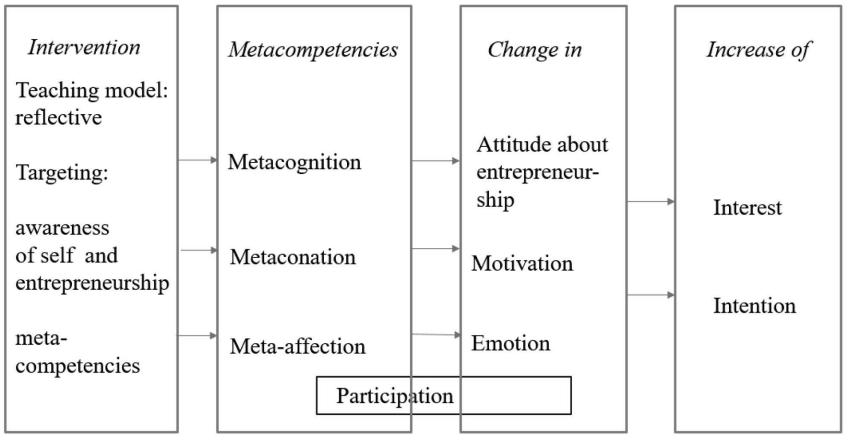

Figure 3. Results of the research. Source: Author

These studies represent research that provides strong empirical evidence arguing for metacompetencies as a theoretically established combination of metacognition, metaconation and meta-affection. This research also successfully pioneered the use of metacompetencies in practice by giving proof of the value it offers to EE. This study established the following:

- Metacompetencies, consisting of metacognition, metaconation and meta-affection, are a strong theoretical concept ($\alpha = 0.86$), and the three components are in strong correlation ($r = 0.7$).
- Metacompetencies have a positive effect on EE learning outcomes. The development of metacompetencies correlates with a change in attitudes, interest, intentions, motivation and emotions in the EE course ($\alpha = 0.83$).
- Participation is important to enhance metacompetencies and facilitate learning.
- The theoretical model was confirmed by empirical research and can be used as an instructive model for integrating metacompetencies in EE.

This study confirmed the concept of metacompetencies, demonstrating that metacognition, metaconation and meta-affection are interrelated, strongly correlated and in possession of high internal validity. The theoretical research model and empirical model of the connection between metacompetencies and EE contributes to the discussion and understanding of metacompetencies' impact on changes in students' attitudes, motivation, emotions, interest and intentions towards entrepreneurship. It follows that, for the development of students' metacompetencies, course programmes should include teaching models that support the development of all three metacompetencies.

4 Discussion

Drawing from the objectives of this thesis to develop a theoretical concept of metacompetencies, empirically test the concept and assessment methodology, and look for integration opportunities into EE, this further discussion presents the findings and solutions in a similar order. The research was designed to explore and establish the theoretical construct of metacompetencies, starting with the more commonly researched subcomponent, metacognition. Advancing from that, this project set out to understand the differentiation bases for metacompetencies and develop an instrument for assessment before finally integrating metacompetencies into an entrepreneurship course.

Based on theory it was acknowledged that, enhancing students' competitive enterprising competencies, metacognition is an independent phenomenon, derived from educational psychology (Schraw & Dennison, 1994) and is considered an entrepreneurial way of thinking (Mitchell et al., 2005). Metacognition is also the theoretically most advanced construct belonging to metacompetencies. There was no evidence available about the development of students' metacognitive abilities in the EE field. In parallel to developing the assessment instrument for metacompetencies (Article 1) this research thoroughly explored metacognition in and for EE (Article 2). The study presents success factors important for future, but more importantly, shortcomings in students' thinking habits. The ability to question one's own assumptions is equally problematic both for undergraduate and graduate students. The substantive difference between more meta-competent and less meta-competent students is clearly visible. On the positive side, students are aware of the connection between knowledge and performance and that there are several options worth considering, but they lack the ability to question their own sources of knowledge and have a low level of conscious control over their own performance.

These outcomes are in line with the findings of the third research paper, where students' procedural cognitive abilities are considerably behind those of entrepreneurs. Students have a clear achievement orientation, and set general goals, but when looking for ways to achieve those goals, they lack the ability to analyse, question and challenge their own learning and achievement. Setting sub-goals does not come from awareness, or from an inner will, but from necessity or external circumstances. The interviewed students admitted doing what they were told to do and no more; that is, that they were - not consciously following through on their personal development and potential. This study provides a detailed theoretical insight into how and why weak metacognitive abilities appear in learning situations and offers a toolbox for the development of metacognitive abilities through entrepreneurship courses for each of the sub-constructs of metacognition.

The thesis strongly supports the claim that Mitchell et al. (2005) make, that metacognition is an entrepreneurial way of thinking. Moreover, claiming that metacognition can be trained supports similar propositions for general competencies (Brandstätter, 2011) and metacognition in particular (Batha & Carroll, 2007; Rahman, 2010). Among other methods, reflection comes out as crucially important and recommended for this purpose (Kurczewska et al., 2017). Opposing increased resistance to business planning, as a teaching method, this research demonstrates how using business planning concept for planning and monitoring purposes enabled several metacognitive exercises such as setting individual goals, sub-goals and timeframes,

as well as reflecting upon and synthesising knowledge and strategic choice and decision-making, monitoring. It is also important to note that students have different needs for development, coming from a variety of backgrounds and having varying intelligence. Metacompetencies enhance students' development regardless of prior experience or intelligence.

In accordance with the study on metacognition, the assessment and exploration of metacompetencies found that students can be differentiated based on metacompetencies (Article 1). Moreover, there is a consistency throughout the research with the different samples (Articles 1, 3, 4). The pattern appears in the clustering of mean scores when one component of the construct predicts the same standard in others. Thus, we can infer that assessing any single aspect points to the general metacompetency level. However, deeper investigation offers interesting discrepancies: for example the statements reflecting the importance of task value, significance and meaningfulness, which are scored higher, were also made by generally lower-scored students. This correlates with the study comparing students and entrepreneurs, where the volitional component was equally strong in both groups. On the other hand, the lowest evaluations were given to motivational items of metaconation. Self-motivation, according to our students' evaluations, is the most difficult, yet again replicated result (Article 3), revealing the gaps between students and entrepreneurs. The first tentative assessment instrument needs further validation because it is essential to follow the line of research in different social groups, start-up camps or even joining the university. Developed in the framework of this thesis, the instrument (Article 1), is suitable for current research confirmed by students' reflections as for replicative studies it can be further developed for shorter and more convenient tool for wider use.

Comparing the measures of students and entrepreneurs samples, substantial gaps appear (Article 3). Although it will require future verification, it can be argued that these gaps in awareness of procedural knowledge, motivation and temperament are critical to entrepreneurial behaviour. So far, the specific gaps found are supported by parallel work (Kurczewska et al., 2017), which suggests that procedural and declarative knowledge have very different profiles. It is vital for the behaviour of entrepreneurs that they have a repertoire of procedural knowledge for how to do things, which way to go, what the other options may be, and so on. This can be replicated in classrooms by designing different business models, evaluating several strategic options, or by the creation of an inventory of one's own skills and competencies to craft a plan for personal development, as the final study in this project, directed to EE development, proposes (Article 4).

The solutions and evidence of the final study (Article 4) allow the discussion of the problem of negative entrepreneurship course outcomes presented by Oosterbeek, van Praag and Ijsselstein (2010). Offering the compulsory course increased self-perception and the realism of entrepreneurship, but there was also low interest for the course and topic, which influenced the negative result, supporting the observations of the researchers. Indeed, based on the results of this thesis, self-awareness alone does not create change, being only one aspect of metacompetency. Self-management, the ability to cope with difficulties, one's own emotions and motivations, planning and monitoring one's own achievement, are inevitable parts of success, whether in learning or professional life. In addition to self-awareness, courses that increase skills, intentions and positive attitudes towards entrepreneurship should include methods for working with beliefs and encouraging emotional and motivational change. Critical aspects for success are interest and participation. This may also explain the dilemma Fayolle and Gailly

(2015) describe, where students previously connected to entrepreneurship report negative outcomes in entrepreneurship courses. This could be the result of a fixed mindset, which can only be challenged if participation requires belief-challenging debates and discussions. This thesis provides results where students are so confident in their experiences that they skip classes and are content with turning in their homework. Their grades are good, but their attitudes and beliefs remain the same and they have no interest in digging deeper. As the last paper confirms, interest has a direct influence on emotions, motivation and intentions. It clearly indicates that a one-approach method is not purposeful enough. EE, serving the competitive advantage for undergraduates and graduates, requires a more holistic approach. The concept of metacompetencies, an approach where gender, nationality and prior knowledge are irrelevant, provides new opportunities to the field to develop students as individuals, along with their interest and intentions towards entrepreneurial endeavours.

This project successfully implemented tasks to explore and validate the theoretical concept of metacompetencies and an assessment methodology with empirical evidence, integrating the concept into EE framework. The results support the argument that EE can transmit knowledge and necessary entrepreneurship skills by creating awareness about the skills and about the learner, who must question and develop his or her own beliefs and capabilities through social settings, reflection and interaction. Competency has its origins in the Latin word *competentia* which means being authorised to judge and having the right to speak (Caupin et al., 2006: 9). Metaphorically speaking, individuals possessing high-level metacompetencies can be trusted to see the bigger picture and environment, and have the ability to choose solutions by weighing a variety of options and strategies. This also reflects the epistemological essence of metacompetencies: knowing oneself and the world in action, as well as having more adequate self-perception through awareness and self-management, resting on the ontological perspective of being aware and conscious of one's own thoughts, motivations, emotional states and so on. This goes along with managing one's own motivation, emotions and behaviour and coping in changing situations and environments, which leads to the axiological prospect of metacompetencies: valuing and fulfilling one's own potential and succeeding in the ventures of life. Possessing metacompetencies gives students better developmental opportunities and therefore, competitive advantage.

5 Conclusion

This thesis provided detailed theoretical and empirical insights into how and why metacognitive, metaconative and meta-affective abilities – defined as metacompetencies, appear in learning situations and in entrepreneurship, offering an instrument for assessment and a toolbox for the development of metacompetencies through an entrepreneurship course for each of the metacompetency sub-constructs. The interdisciplinary thesis takes a step forward to build a useful, empirically validated framework of metacompetencies for EE to enable future entrepreneurs to cope in a rapidly changing socio-economic environment. Out of the wide variety of conceptualisations studied, the tripartite model consisting of metacognition, metaconation and meta-affection was chosen as it met the suggestions of the literature based on the crucial role of motivational and emotional aspects in educational interventions emphasized by scholars.

Research contribution and implications

The research sought to define metacompetencies for EE involving a series of studies that were dependent on each other and used a multiple-method approach, causing several challenges. In defining metacompetencies under new conditions, these studies could not avoid partial repetition of earlier (Kyrö et al., 2011) or parallel (Kurzcewska et al., 2017) studies. Continuing this recently started development discussion on metacompetencies in EE framework, according to the research questions, the theoretical contribution of this thesis to the literature includes the following:

- Further developing metacompetencies (and explaining different statements of metacompetencies in the assessment tool) in the context of EE based on students' expressions in different educational settings and using different groups (students and entrepreneurs; Articles 1, 4). The conceptualisation of metacompetencies contributes to an indicated shortage of theoretical discussions of metacompetencies in the entrepreneurship field.
- The tentative instrument developed for measuring metacompetencies (including metacognition, meta-affection and metaconation, where measures for last two were added) was empirically tested through different studies (Articles 1, 4). The concept of metacompetencies is a strong theoretical concept (α=0.86) and the three components are in strong correlation (r = 0.7).
- The research has empirically confirmed the concept of metacompetencies, demonstrating that metacognition, metaconation and meta-affection are interrelated, strongly correlated and in possession of high internal validity. For example, students with higher-level assessments showed higher scores in all three metacompetencies, and the same interdependence was discovered among students with lower levels of metacompetencies. Similar interrelations were also noticed among the subcomponents of metacognition (Articles 1, 2, 4).
- For the first time, the gaps in metacompetencies between students and entrepreneurs were detected and defined in areas of procedural knowledge, aspects of motivation and understanding of one's own temperament (Article 3).
- Additionally, an empirical model of the connection between metacompetencies and EE demonstrated the impact of interventions on changes in students' attitudes, motivation, emotions, interest and intentions towards entrepreneurship, stressing the importance of participation (Article 4).

The results of the research in this thesis show that metacognition can be enhanced through EE. Also, all three metacompetencies (metacognition, meta-affection and metaconation) may have a positive developmental trend when a course is purposefully designed and a variety of tasks for individual and collective activities (e.g., discussion and sharing experiences, reflection) are involved. The development of metacompetencies is in correlation with changes in attitudes, interest, intentions, motivation and emotions during an EE course (α=0.83). The opposite results were noticed among those students who did not participate in the course (Articles 2, 4).

Derived from the results of research, there is a practical contribution of the thesis addressed to entrepreneurship educators, suggesting that course designs should be centred on individual and collective activities giving attention to the most underdeveloped metacognitive abilities (Article 1). In addition, the investigation of gaps between students and entrepreneurs highlighted specific aspects of metacompetencies that are in a need of special attention and intervention, contributing to a more holistic development of students' metacompetencies (Article 3, 4).

In conclusion, this thesis suggests that EE embeds metacompetencies into its active, experiential approaches and tools, such as reflection, debates and proactive social settings, can be dynamic, addressing students' beliefs, attitudes, motivation, interest and emotions through awareness and training. This leads to an increased intention to be involved in entrepreneurship. The results of the research stress the importance of involving metacompetencies in EE since possessing metacompetencies appears to be common in entrepreneurs. Furthermore, as stable characteristics that differentiate some people from others across all situations, metacompetencies are not dependent on intelligence or demographic variables.

This thesis, consisting of purposeful line of studies, demonstrates that metacompetencies are important explanatory mechanisms for a variety of enterprising and entrepreneurial behaviours and reveals relevant discrepancies between student samples and between students and entrepreneurs. The results prove that promoting metacompetencies has an impact on motivation, intentions and subsequent entrepreneurial behaviours. The practical implication of this thesis is to provide sufficient rationale for entrepreneurship educators to discover metacompetencies and empirically tested instructions for implementation.

Limitations and future research

For the theoretical development of the concept, one of this thesis's limitation lies in its use of one universtiy. It would be interesting to compare assessments in different educational frameworks, which would require the same assessment base. The development of the assessment instrument relied widely on earlier elaborations. Although it was piloted, and its factor loadings demonstrated the correct positioning of subconstructs, a more rigorous validation of the assessment instrument is required before it can be recommended for wider use. In order to proceed with the research, a faster solution was chosen using added in-depth interviews to confirm and explain the results of the survey. However, this weakness has been noted, and a new, thorough study on a shortened version of the assessment instrument is already in progress. A reliable instrument for metacompetency assessment is important to evaluate the impact of metacompetency-based interventions. Qualitative methods are very time cosuming, especially when evaluations are planned more frequently.

The important and required expectation of EE is the quality of outcomes of its interventions. This thesis piloted the first full-term metacompetency-based course, and, in spite of its positive results, replications are required to gather more evidence and further modifications.

The analysis between students and entrepreneurs brought out interesting gaps in metacompetency components. These gaps are recommended for further investigation. And finally, experimenting with different environments, education setting and methods, will add richness to implications offered by this thesis.

It is time to change the discourse surrounding EE in light of long-lasting complaints about the field does not consider motivational and emotional aspects and possesses little evidence about the impact of deeply experiential programmes. Instead, new approaches, methods and tools that produce observable changes need to be demonstrated. Then, the longitudinal impact of metacompetencies on students' success will be available for observation.

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This thesis was provoked by being an entrepreneur and throughout the practice and studies in parallel created awareness that behind every entrepreneurial endeavour, every organisation, is an individual with own beliefs, attitudes and competencies. Having this insight, parallel psychology program to business administration became an obvious step in my course of life-long learning.

This thesis incorporates the basic understanding of behavioural antecedents from psychological perspective and the contemporary needs of entrepreneurship education to support society with more content and self-managing, happier individuals in this hectic world. In that sense, the topic of metacompetencies itself was in the core of my own development and overcoming challenges by awareness of my own autonomous motivation, maintaining perseverance and dealing overcoming occasional frustration.

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Abstract
Defining Metacompetencies for Entrepreneurship Education

This thesis is motivated by recent appearance of new in entrepreneurship field concept of metacompetencies, presenting preliminary but promising implications for advancement of entrepreneurial behaviour.

Entrepreneurship education has been extending beyond business creation preparing students for work life, promoting intrapreneurship up to taking the responsibility for graduates' success in life. This has set the challenges both to understand the new, future oriented expectations and the means of entrepreneurship education (EE). Scholars have reached the conclusion that studies on the outcomes of EE are scarce, especially when describing the intervention. It is also criticized that focus in EE is too narrowly set to cognition, opportunity recognition and intention. To cope with economic and social changes, uphold enterprising behaviour and promote positive attitudes new approaches for EE are requested.

Metacompetencies seem to be the concept allowing that and should therefore be the subject of through study. The research on metacompetencies has been eclectic starting with metacognition with myriad of research in a consent of its overarching nature and entrepreneurial way of thinking. Conceptualisation of metacompetencies is vague, with only few establishments in EE framework.

Taking the tripartite construct of metacompetencies (metacognition, metaconationa nd meta-affection) as a base for this thesis, the overall aim is to further develop and define metacompetencies for entrepreneurship education. More specifically, the research questions were formulated:

1. How to define metacompetencies in the context of EE?
2. How to assess metacompetencies?
3. What is the connection between metacompetencies and EE?

To answer these questions and follow the aim, research process involves many studies, sub-tasks divided between four articles, as for example an assesment instrument development for metacompetencies, an approach of mixed methodology was chosen. Two of four papers (1,2) rely on statistical data and analysis and two articles are based on qualitative data and phenomenological approach underneath (3,4) with statistical validation and Bayesian modelling at the end (4). All samples were unique and international, both students and entrepreneurs.

Results of the thesis support further development of metacompetencies and demonstrate strong construct validity. Metacognition, metaconation and meta-affection are interdependent and can be assessed. The first tentative instrument was developed. Students can be differentiated based on metacompetencies while strong scores in one component reflect in others as well. This pattern corresponds to metacognition scale scores. Both studies bring out weaker areas of students' metacognition, metaconation and meta-affection. These results are confronted to results assessing entrepreneurs' metacompetencies. The gaps in procedural knowledge, motivation and temperamet are present among students. Finally, the course of entrepreneurahip is designed to enhance students metacompetencies. Students' changes in attitudes towards entrepreneurship, motivation, interest, and emotions are in parallel assessed and turn to be positive in case of active classroom participation. In conclusion, relying on results, metacompetencies are defined for entrepreneurship education but further studies are recommended.

Lühikokkuvõte
Metapädevuste määratlemine ettevõtlusõppes

Uuringu taust ja teoreetilised alused

Ülikoolid on teadvustanud lisaks ettevõtlusvõimekusele kui noore täiendavale karjäärivõimalusele ka ettevõtlikkust laiemalt, mis on tõendatud positiivse mõjuga tööalases sooritustes (Jones et al., 2017). Samuti on leidnud tõendamist ettevõtlusõppe oluline roll ja võimekus ettevõtlikku käitumise arendamisel ja sellest tulenevalt ka üldise paraneva edukuse mõjutajana (Li & Liu, 2011; Martin et al., 2013; Ba et al., 2014). Ettevõtlusõppest saadavad positiivsed hoiakud ja uskumused koos praktiliste teadmistega aitavad kiirelt muutuvas maailmas paremini kohaneda ja toime tulla. Ettevõtlikkusest on saanud majandusliku mõjuga võtmepädevus, mis on eeliseks nii õppetöös kui tööturul. See on mõjutanud mitmeid uuringuid võtmepädevuste erinevate kontseptsioonide ja mõõdikute arendamisel, mis demonstreerivad tugevat seost akadeemiliste tulemuste, käitumise- ja mõttemustrite vahel (Dries & Pepermans, 2007; Pintrich, 2002; Schraw, 1998; Weinert, 2001). Seetõttu on ettevõtlusõppe eesmärgid muutumisel, et noori majanduslikeks ja sotsiaalseteks muutusteks paremini ette valmistada läbi isiklike pädevuste arendamise märkamaks uusi ideid ja võimalusi, neid ellu viia (European Commission, 2008). Oluline on arendada ettevõtlusõppe muutunud vajadustele vastavaid mudeleid ja sisu (Fayolle, 2018; Kurczewska et al. 2017; Li & Liu, 2011; Mwasalviba, 2010). Jones ja Matlay (2011) viitavadki kriitiliselt olukorrale, kus ettevõtlusõpe on endiselt ettevõtluskavatsuste ja ärivõimaluste äratundmise keskne.

Nüüdisaegne ettevõtlusõpe loob reflektiivset õppekeskkonda, mis tõstab õppija eneseteadlikkust ja toetab üliõpilaste eneseregulatsiooni võimekust (Kurczewska et al. 2017). Siiski on rohkelt viiteid, et olulised õppimisega seotud tegurid nagu motivatsioon ja emotsioonid, ei ole ettevõtlusõppe valdkonna uuringutes piisavalt tähelepanu saanud (Kirby, 2004; Phan et al., 2002). Koos motivatsiooniga (Hytti et al., 2010) on emotsioonid aga ettevõtlusõppe keskmeks (Kurczewska et al., 2017; Kyrö, 2008). Viimased viitavad pikka aega sotsiaalpsühholoogias tuntud kolmikmudelile (*cognition-conation-affection*), mis tunnetusprotsessis motivatsiooni, tahte ja emotsioonid, küll vastasmõjus, aga eraldiseisvatena käsitleb (Rosenberg ja Hovland, 1960; Robinson et al., 1991; Snow 1996). Sama mudel leiab põhjalikku käsitlemist ka ettevõtluse raamistikus (Ruohotie ja Koiranen, 2000) ning uue (meta)tasemel edasiarenduse metapädevuste näol (Kyrö jt., 2011). Metapädevusi on väga erinevalt formuleeritud alates üheksakümnendatest. Enim kontseptuaalseid diskussioone leiab juhtimisvaldkonnast määratledes juhi eduks vajalikke pädevusi. Need diskussioonid rõhutavad loovust ja vaimuerksust (Reynolds & Snell, 1988; Pedler et al., 1994) kuni probleemi lahendamise oskuse ja sotsiaalse võimekuseni (Buckley et al., 2002). Siiski on jõutud metapädevuste defineerimisel teatud kokkuleppeni, et need on defineeritavad läbi eneseteadlikkuse ja -regulatsiooni, mis päädivad efektiivsema käitumisena erinevates olustikes või kõrgemal asetseva pädevusena, mis võimaldab omandada ja rakendada kõiki teisi oskusi ja kompetentsust läbi enese(arengu) teadlikku juhtimise.

Uuringu eesmärgid

Teooria areng võimaldab arvata, et metapädevused võiksid olla ettevõtliku indiviidi üheks baasvõimekuseks. Paraku on metapädevuste-alased uurimistööd valdavalt teoreetilised ja ka kontseptuaalselt eristuvad ning on alles hiljuti jõudnud ettevõtlusõppe valdkonda. Seetõttu ongi selle töö laiemaks eesmärgiks arendada edasi metapädevuste

teoreetilisi aluseid ning seoseid ettevõtlusõppega ehk määratleda metapädevused ettevõtlusõppe kontekstis. Selleks esitab doktoritöö täpsemad uurimisküsimused:

1. Kuidas määratleda metapädevusi ettevõtlusõppe kontekstis?
2. Kuidas mõõta metapädevusi?
3. Kuidas seostada metapädevusi ja ettevõtlusõpet?

Uurimisküsimused jagunevad nelja publitseeritud uurimustöö vahel, mille teoreetiliseks aluseks on meta-tasandil esitatud kolmikmudel (*cognition-conation-affection*) ülekantuna ettevõtlusõppe raamistikku (Kyrö et al., 2011).

Artikkel 1 tugineb varasemalt väljatöötatud instrumendile metatunnetuse hindamiseks üliõpilastel (Ling et al., 2013) ja teadlaste poolt pakutud mõõdikutele motivatsiooni-, tahte- ja temperamendi komponentide määramiseks. Uurimuse eesmärk on arendada instrument metapädevuste kõigi kolme alakomponendi määramiseks ettevõtlusõppe raamistikus.

Artikkel 2 süüvib ühe enamuuritud metapädevuse, metatunnetuse (*metacognition*) väljendumisele ja arendamisele ettevõtlusõppes.

Artikkel 3 avastab esmakordselt metapädevusi ettevõtjatel. Eesmärgiks on leida erinevusi ettevõtjate ja üliõpilaste metapädevuste väljendumisel.

Artikkel 4 jälgib terve semestri jooksul toimuva ettevõtluskursuse käigus aset leidvaid muutusi üliõpilaste ettevõtlusalastes hoiakutes, kursusel osalemisega seotud motivatsioonis, huvis, järjekindluses ja emotsionaalsetes aspektides. Kursus on üles ehitatud toetama üliõpilaste metapädevusi. Eesmärgiks on leida seosed metapädevuste ja kursuse käigus toimuvate individuaalsete muutuste vahel, et anda soovitusi tõhusama ja terviklikuma ettevõtlusõppe arendamiseks.

Uuringu metoodika

Uuringu metoodika on mõjutatud hetkel haridusvaldkonnas kiiresti juurdunud sotsiaal-konstruktivistlikust paradigmast, mis viitab õppijast lähtuvale metoodikale ning jätab õpetajale pigem suunava, juhendava vaatleja rolli. Teadmine saadakse sisu kaasamisel ja interpreteerimisel aktiivses, sotsiaalses kontekstis. Sotsiaal-konstruktivistlik metoodika on pigem kvalitatiivne. Kuigi doktoritöö kasutab mitmeid nii kvalitatiivseid kui kvantitatiivseid meetodeid, on artiklid jagunenud pooleks, kus kaks on statistilisele andmestikule tuginevad (1,2) ja kaks tuginevad fenomenoloogilisele alusele (3,4). Täpsemalt koosneb töö neljast publitseeritud uurimustööst erinevate valimitega:

Artikkel 1 tugines statistilisele analüüsile, mis piloteeris uut, metapädevuste määramiseks loodud küsimustikku, mis suures osas tugines varasematele arendustele. Valimi moodustasid 98 kohustuslikule ettevõtluskursusele registreerunud rahvusvahelist, erinevate erialade üliõpilast. Viidi läbi küsimustiku faktor-analüüs ja tulemuste klaster-analüüs.

Artikkel 2 kasutas olemasolevat küsimustikku (MMA) 190-st rahvusvahelistest üliõpilastest ja erinevatelt erialadelt koosnevas valimis. Statistiline, sh. klaster-analüüs eristasid üliõpilased metatunnetuse komponentide alusel. Tulemuste interpreteerimiseks intervjueeriti viite valimis olnud üliõpilast.

Artikkel 3 andmestik koosnes poolstruktureeritud intervjuudest, mis viid läbi 30 eri rahvusest ja tööstusharus vähemalt 3 aastat tegutseva väikeettevõtjaga. Tulemused võrreldi samade aspektide osas üliõpilastega.

Artikkel 4 osutus kõige keerukamaks ja seda järgib mitmekesine metoodika. Uuring tugineb fenomenoloogilisele alusele, andmestikuga üliõpilaste õpipäevikutest. Valimi

moodustasid 99 kohustuslikule ettevõtluskursusele registreerunud 99 üliõpilast erinevatelt erialadelt. Kvantitatiivne andmestik kodeeriti ja kanti üle Likerti 4-tüüpi skaalale, mis võimaldas edasist statistilist analüüsi. Uurimiskonstruktide omavaheliste seoste määramiseks oli sobiv Bayesi tõenäosusjaotuse konstrueerimine.

Kokkuvõttes saab väita, et metoodika valik täitis eesmärki, andes sisukaid tulemusi ja võimaldab anda vastused uurimisküsimustele.

Kokkuvõte uuringu tulemustest

Uuringu tulemuste põhjal võib väita, et metapädevus on oluline indiviidi õppimist, arengut ja toimetulekut toetav võimekus. Uurimused erinevate valimitega kinnitasid valitud teoreetilise metapädevuste kolmik-konstruktsiooni (*metacognition, metaconation, meta-affection)* usaldusväärsust. Ehk metapädevustest saab rääkida kui tunnetuslike (kognitiivsete) aspektide, nagu mõtlemine, planeerimine kui ka käitumuslike (konatiivsete) nagu motivatsioon, tahe, järjekindlus ja emotsionaalsete (afektiivsete) reaktsioonide teadvustamine ja sihipärane juhtimine ning arendamine.

Atikkel 1 leidis, et üliõpilased, kes on tugevad ühes metapädevuse komponendis, on seda tõenäoliselt ka teistes. Ja vastupidi. Madal võimekus oli iseloomulik samuti läbi kolme komponendi.

Artikkel 2 kinnitas, et eelkirjeldatud tulemus on sama mustriga metatunnetuse alakomponentide suhtes ka uues valimis vaid metatunnetuse (*metacognition*) küsimustiku põhjal tehtud uurimuses. Samuti ka nii kvalitatiivse meetodi rakendamisel kui kvantitatiivsel mõõtmisel.

Artikkel 3 demonstreeris, et ettevõtjad on üldiselt väga hästi teadlikud oma mõttemustritest, motivatsiooni ja tahte mõjutajatest ning emotsionaalsetest reaktsioonidest ning suudavad neid ka teadlikult kontrollida ja juhtida. Nii võib arvata, et metapädevus on üks ettevõtjaid eristav võimekus. Lisaks tuli ilmsiks ettevõtjate ja üliõpilaste valimite vahel huvitavad erisused. Üliõpilastel jääb vajaka protseduurilist tüüpi mõtlemisest, kuna deklaratiivset tüüpi mõtlemine oli ühtviisi esindatud nii ettevõtjatel kui üliõpilastel. Samuti eristus nõrgemana üliõpilaste teadlikkus motivatsioonist ja motivaatoritest, kuid tahte väljendused olid hästi esindatud. Ja erandiks ei ole ka meta-affektsiooni komponent. Ka siin ilmnes oluline eristumine ettevõtjate ja üliõpilaste vahel, kus ühtviisi hästi kirjeldati tujude ja situatsiooniga seotud tunnetega seonduvat, kuid üliõpilased on vähem teadlikud oma pikemaajalisest temperamendist.

Artikkel 4 viitas metapädevuste kõikide komponentide interaktsioonile ja tihedale seosele ettevõtluskursuse eesmärkidega. Üliõpilased, kelle huvi ja motivatsioon ettevõtlust õppida kursuse jooksul kasvasid, nagu ka toimetulek oma emotsioonidega, raporteerisid suuremat valmisolekut ja huvi ettevõtlusega tulevikus alustada. Nende hoiakud ettevõtluse suhtes positiivsemaks olid sageli läbi teinud kardinaalse muutuse. Samas oli üliõpilasi, kes küll aine hästi sooritasid, kuid hoiakud ja ettevõtluskavatsused algsega samaks jätsid. Üllatuslikult on eristavaks faktoriks aktiivne kursusel osalemine.

Kokkuvõttes määratleb uuring metapädevused ettevõtlusõppes, andes neile sisu ja mõõdikud ning kinnitades konstruktsiooni. Uuring tõendab, et metapädevuste arendamine üliõpilastes avaldab positiivset mõju ka ettevõtlusaine eesmärkide saavutamisele. Täiendavalt võib valimeid ühendava statistilise analüüsi põhjal väita, et metapädevused ei ole seotud demograafilise tausta ega eelneva kokkupuutega ettevõtlusõppes kuid oluliseks osutus osalusaktiivsus.

Uurimistöö panus ja piirangud

Doktoritöö annab põhjaliku ülevaate, kuidas metapädevused (metakognitsioon, metaafektsioon ja metakonatsioon) ilmnevad ettevõtlusõppes ja ettevõtluses ning panustab metapädevuste kontseptsiooni edasiarendamisse, esitades metapädevuste hindamisvahendi ja selle empiirilise valideerimise tulemused. Nii annab doktoritöö olulise edasiarenduse senistele esmastele diskussioonidele metapädevuste olulisusest ettevõtlusõppe kavandamisel. Olulised erisused on välja toodud ettevõtluspedagoogidele arvesse võtmiseks õppetöö kavandamisel. Samuti annab töö praktilisi viiteid metapädevuste nõrgematest kohtadest üliõpilastel võrreldes ettevõtjatega. Samuti demonstreerib ja soovitab meetodeid metapädevuste toetamiseks ettevõtlusõppes.

Doktoritöö raames läbi viidud uuring metapädevuste määratlemiseks ei ole ammendav üldistuste tegemiseks. Uuring toimus ühes ülikoolis ja pilootkursus viidi läbi ühe õppejõu poolt. Edasine erinevaid institutsioone, õppedisaine ja ka eksperimenti hõlmav metapädevuste uurimine on vajalik. Edasine uurimine oleks vajalik kogu populatsiooni arvestades, kuna ka üliõpilase staatus võib eeldada kõrgemat metapädevuste taset. Kinnitamist vajab metapädevuste mõju õpiväljunditele ja erinevate meetodite tõhusus. Selleks on usaldusväärse mõõtevahendi edasiarendamine ka autoril käsil.

Kokkuvõttes on doktoritöö määratlenud metapädevused ettevõtlusõppe raamistikus, demonstreerides uuringuga, et ettevõtlusõpe, mis teadmiste kõrval panustab ka üliõpilaste positiivsete hoiakute ja ettevõtliku käitumise muutmisele, vajab mitmekülgsemat, terviklikuma ettevõtluskursuse disaini.

Appendix

Article I

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THE ASSESSMENT OF STUDENT METACOMPETENCE IN THE CONTEXT OF ENTREPRENEURSHIP EDUCATION

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Abstract

The importance of the development of metacompetencies in students has gained attention in the context of entrepreneurship education. Previous research has investigated factors that increase student self-efficacy and self-regulative constructs helping them cope better in entrepreneurship, and to be more entrepreneurial. Metacognition has been a valuable finding for years but only a few studies of meta-affection and metaconation are available.

The aim of this paper is to identify the extent to which student perceptions include metacompetencies; in other words, metacognition, meta-affection and metaconation in the context of entrepreneurship education. To that end a new measurement tool was developed and new questionnaire items were added to explore meta-affection and metaconation.

The results of student self-assessments showed certain differences although a close connection was evident between student metacompetencies. In addition, tasks that related value and feelings are very important to students but the metaconative components of motivation and will were evaluated the lowest. The study gave us confidence that in the learning process we cannot set a preference for cognition or motivation. The study found that learning is an integrated function of thinking, feeling and behaving in tight interaction and overlapping areas induced by educators.

1. Introduction

Research into entrepreneurship education has faced the need to change the entrepreneurship education paradigm (e.g. Gibb 2004; Fayolle 2007), recommending that entrepreneurship programmes should be redesigned by shifting them from a teaching to a learning perspective, focusing on output orientation where both content and process are examined to achieve the desired output. Self-regulation has been one perspective (Zimmermann 1995), as it is claimed that attitudes are also open to change (Robinson et al. 1991) under the influence of educators and practitioners.

How can people learn to be proactive or autonomous, and to behave in an enterprising manner – entrepreneurial cognition issues have already deserved considerable attention (Baron and Ward 2004) and opinions exist among scholars suggesting that the cognitive perspective of entrepreneurship helps us understand various aspects of the entrepreneurial process (e.g. Gaglio and Katz 2001). For some period, metacognition has found many proponents (e.g. Mitchell et al. 2005, Haynie 2005) in entrepreneurship education research, while Efklides (2008) studying metacognitive experience for many years, argues that metacognition on its own is not enough to have the desired outcomes in terms of attitudes and behaviours, as feelings and emotions are always involved in creating the will.

Kyrö (2006) has reached the conclusion that increasing entrepreneurial/enterprising competencies requires the ability to find a way to support students in developing their individual metacompetencies through metacognition, meta-affection and metaconation (Kyrö 2006). This tripartite model incorporating cognition, affection and conation has been under study since the 1960s (Rosenberg and Hovland 1960, Robinson et al. 1991, Snow et al. 1996). Later, research developed into separate deeper explorations of constructs. Some researchers emphasise the importance of conation (Koiranen and Ruohotie 2000, Riggs and Gholar 2009) and others draw attention to affection (Kyrö et al 2006, Efklides 2008, Boulay et al 2010) while most attention is paid to cognition and metacognition.

In 2005, Gibb showed the importance in his work of the integrative approach, including the tripartite division of the mind in entrepreneurial learning and the need for a holistic approach in order to provide better education and self-efficient students.

The first contemporary holistic approach showing the tight interconnectivity between cognition, affection and conation, now at meta-level, was published in 2006 by Kyrö, Seikkula-Leino and Mylläri, who claimed these constructs to be core competencies in entrepreneurial/enterprising behaviour. Nevertheless, as assessment of metacognition has gained reasonable attention (e.g. Pintrich and deGroot 1990, Schraw and Dennison 1994), including in the context of entrepreneurship (Michell et al 2005; Haynie 2005), evaluating the presence of meta-affection and metaconation is only in its early stages.

Considering the foregoing, the current paper aims to contribute to the assessment of student metacompetencies (metacognition, meta-affection and metaconation) based on student self-assessments in the context of entrepreneurship education. Based on this, the following research question was developed:

To what extent do student perceptions include metacompetencies; that is, metacognition, meta-affection and metaconation?

The methodology is based on an empirically tested questionnaire (Haynie 2005, Ling et al. 2013) of metacognitive awareness, which is supplemented with the items expressing meta-affective and metaconative experience..

The current study provides the opportunity to enrich existing entrepreneurship research by extending the empirical evidence via the development of a tool for measuring student metacompetencies (metacognition, meta-affection and metaconation) as well as providing insights into the development of entrepreneurship pedagogy and teaching. The results of student self-assessments of their metacompetencies can be used for the development of entrepreneurship courses with the aim of promoting student self-regulation abilities, allowing them to cope better in the sense of their employability or self-employment.

2. Theoretical framework

2.1. Entrepreneurship education – learning perspective

Authentic learning is a conscious exercise, starting with who we are and evolving into all that we become, as Riggs and Gholar (2009) put it. This definition expresses recent developments in entrepreneurship education research well, focusing on the conscious responsibility of the students' own learning, their future and success.

This learning perspective rests largely on John Dewey's philosophy, which many scholars rely on today. Dewey explains learning through highly individual and unconscious experience based on the observation of things (Dewey 1951), where elements of primary experience are so arresting and engrossing that we tend to accept them just as they are and where the observation of observations makes a subject of study. Change in primary experiences takes place through self-awareness of one's own knowledge, feelings, motivation and conscious development. Dewey (1951) also argued that background plays a major role in the development of individual experience and interest in learning.

The same tradition, namely experiential learning, was followed by Kolb (1984), declaring that learning is a holistic process of adapting to the world. According to him, "learning is not the special province of a single specialized realm of human functioning such as cognition or perception but involves the integrated functioning of the total organism – thinking, feeling, perceiving and behaving".

Kolb also suggests (1984) in addition to knowing how we think and how we feel, we must also know when behaviour is governed by thought and when by feeling. At the same time,

studies on metacognition as the higher order thinking of one's own thoughts (Flavell 1979, Schraw & Dennison, 1994, Nelson 1996) has begun to flourish.

Fayoll and others (2006) define entrepreneurship education programmes in a broad sense as any pedagogical programme or process of education for entrepreneurial attitudes and skills, which involves developing certain personal qualities, and therefore, not exclusively focused on the immediate creation of new businesses. The question of how to learn entrepreneurial and enterprising behaviour has recently become one of the core questions in entrepreneurship education (Kyrö et al. 2006). Issues indicated by Gartner and Vesper (1993) that teaching programmes vary widely across countries and educational institutions, be it in terms of objectives, target audiences, format and pedagogical approaches, have remained. So Fayoll and others (2006) remind us of the need to develop a common framework to evaluate, compare and improve the design of those programmes, which goes beyond the estimation of their short-term microeconomic impact (Fayoll et al.2006). Moreover, the contribution of the latter lies in showing that student interest, awareness and intention can also be measured.

Using as a basis for the current study, we have chosen the instrument for the assessment of metacognitive awareness and entrepreneurial adaptability by Haynie (2005), intended and developed for use with students and entrepreneurs. Haynie and Shepherd (2009) have conceptualized metacognition's five theoretical dimensions as goal orientation, metacognitive knowledge, metacognitive experience, metacognitive control, and monitoring, following entrepreneurial behaviour. However, according to Efklides (2009), metacognition has no direct access to behaviour. Moreover, continuous thinking or supervision of one's negative thoughts draws the thinker into a deeper circle of concern, and as expressed by Efklides (2009), may even fail to support successful behavioural outcomes. So we have to admit that self-regulation in entrepreneurship as well as in learning situations, is not limited to the awareness of the individual's own knowledge, choices or monitoring. Emotions are important as they have considerable effect on the way we think, on motivation, beliefs, attitudes and values (Jarvis 2006). A similar position has also been taken by other researchers (e.g. Flavell 1976, Pintrich 2002, Efklides 2009), stating that motivation, including will and value components, is an important trigger in the use of cognition, as individuals also have beliefs about their motivation that are tied up with social-emotional processes (Zimmermann 1995, Kyrö 2012).

To sum up, in entrepreneurship education we have reached a situation where according to the environment a new type of competence is required from students, but recent research has primarily concentrated on single-construct investigations. So Schraw and Dennison (1994) claim that metacognitively aware students are more strategic and perform better, and Schraw (1998) argues this awareness can be induced by educators. The same is argued for attitudes being open to change (Robinson et al. 1991) and influenced by educators and practitioners while some before-after measurements show (e.g. Haynie 2005) an increase in metacognitive awareness and an improvement in study results after *treatment* supported by Mitchell and others (2005), proposing that metacognitive thinking can be deliberately practiced in the entrepreneurial context. For students who tend to quit prematurely, Burleson (2006) claims learners' beliefs about their intelligence can be changed using the same meta-affective skills to help students become better learners. Riggs and Gholar (2009) again propose concrete exercises and strategies to enhance higher order conation and with the same student motivation.

To contribute to the present needs of entrepreneurship education and to favour a comprehensive approach, the framework of metacompetences proposed by Kyrö and others (2006), using a tripartite framework, will be further investigated and empirically tested.

2.2. Metacompetences - metacognition, meta-affection and metaconation

Human behaviour, especially instructional learning and achievement, involves some mixture of all three aspects, affect, cognition and conation (Hilgard, 1980). Based on this tripartite model describing these three types of reaction to everything (Rosenberg and Hovland 1960), Robinson et al. (1991) first compiled the Entrepreneurial Attitude Orientation (EAO) Scale, including subscales for affection, cognition and behaviour or conation with four attitude components added. According to Robinson et al. (1991), this study represented the first steps toward a better understanding of the psychology of entrepreneurship using attitude models. According to Rosenberg (1960), attitudes are open to change and entrepreneurial attitudes like achievement, self-esteem and personal control may be influenced by educators and practitioners. Ample evidence has later been provided supporting this approach (e.g. Robinson et al.1991, Snow, Corno and Jackson 1996, Ruohotie and Koiranen 2000), while Ruohotie and Koiranen underline the meaning of conation in entrepreneurial and enterprising learning, distinguishing between motivational and intentional as pre and post-decisional states, important in entrepreneurship.

In the context of enterprises, having motivation is not enough to start a company, but could lead to the decision to start, whereas taking real action requires more – volition, the *will* factor – a conative process. The realization of a motivated decision is more likely to happen when the volitional process is consciously guided, it is metaconative as well as including emotional intelligence, an awareness of your own emotions and feelings nourishing or impeding your will, and so it is meta-affective.

The most developed construct is metacognition. Since Flavell (1976), this has been a continuous research subject for scholars mostly in social psychology and education (Brown 1987, Schraw and Dennison 1994, Haynie 2005, Efklides 2008). Slight differences exist in theoretical approaches, but a common ground nevertheless exists in terms of the central role of metacognitive knowledge (declarative and procedural), metacognitive experience, monitoring and most of all, awareness as being aware of one's own cognitive capabilities and being able to self-regulate cognition. In the entrepreneurial context, Haynie (2005) also emphasizes the importance of incorporating the aspects of goal orientation and metacognitive choice, as setting and following goals as well as choosing between a wide variety of available strategies and using feedback are part of the entrepreneurial process. Psychologists (Magar et al. 2008) indicate in their research that people who have poorer cognitive self-regulation may have problems with risk assessment such as the ability to logically weigh choices. According to them poor executive functioning could lead to risky decision-making where the immediate urges for gratification are attained but the possible negative consequences of such decisions are overlooked. According to Riggs and Gholar (2009), metacognition, an advanced form of cognition, occurs when learners are aware of their own cognitive processes and know when, where and how to use these processes to facilitate and support their learning. Still, the latter admit that none of theorists fully explain or demonstrate how metacognitive level learning occurs.

Metaconation on the other hand is a construct that has only recently come into focus while the conative or behavioural construct, consisting of behavioural intentions and predispositions to behave in a given way toward the object (Robinson et al. 1991), is a rather old object of study derived from behaviourism. Snow et al. (1996) divide conation in two sub-components: motivation and volition.

Motivation covers the predecisional needs and processes that underlie the formation of goals, decisions and intentions to act, whereas volition covers the processes of enactment, the perseverance and protection of the intention-action (Snow et al. 1996, Ruohotie and Koiranen 2000).

In accordance with Ruohotie and Koiranen (2000), under motivation we list achievement orientations, including constructs reflecting individual differences in the needs, goals and time perspectives associated with them, various self-related constructs, and interests and attitudes regarding actions, objects and goals. Under volition, various action controls and strategies are listed, including self-regulatory strategies and mindful investment in learning. According to Riggs and Gholar (2009), metaconation is not a complicated concept, it involves ethical actions directed toward achieving the highest good, becoming and living the best or highest self and it involves moral courage. In spite of the common ground among researchers showing that conation and metaconation are unique parts of the same whole, we face a lack of empirical knowledge about how metaconation develops or can be developed.

Watts (1998) has argued that close to the notion of metacognition stands meta-affection, being focused on the affective dimension of learning. He defines meta-affection as the conscious awareness, monitoring, regulation and evaluation of intra-personal and interpersonal affective activity. Starting with Snow affection itself consists of different characteristics including emotions and other affective states such as mood and temperament (Snow. et al. 1996, Ruohotie and Koiranen 2000, Gondim and Mutti 2011). When the "skill" component includes cognitive and metacognitive self-regulated learning strategies, the "will" or motivational component includes both goal orientation and task value (Efklides 2008), being similar to an interest in the focus on student feelings about the topic or task. Like the feeling of knowing and the feeling of difficulty, because they focus on cognition, she has also called metacognitive feelings as part of metacognitive experiences.. The latter explains that task represents an achievement situation, which triggers achievement-related emotions in students such as interest, boredom, enjoyment, hope, fear and anxiety – causing approach or avoidance behaviours facilitating or hindering learning depending on their strength and frequency, and so carrying the characteristics of affection and conation. We have to keep in mind that the student does not only need a positive affective state for high motivation and learning. The learning process may involve and even requires negative affective states like problem-solving frustration (Boulay et al. 2010). Meta-affection is about recognizing these feelings and consciously addressing them by providing an input into the "will" component and taking action towards desired targets we can recognize as metaconation.

It is important to note that a process-oriented competence discussion has emerged, arguing that learning depends on the learner's ability to manage all three, cognitive, conative and affective meta-level abilities of self-regulation (Kyrö et al. 2012). In order to enhance these meta-level abilities or metacompetencies, it is necessary to delve deeper into the interrelations between those competencies to see how they occur in the learning process within the entrepreneurship education domain, and how to assess them. In the following, we identify the current value of metacompetencies our students evolve, and search whether there are aspects of metacompetences that can be developed through entrepreneurship courses.

3. Research Design and Methodology

The empirical evidence has been collected among students from different disciplines at Tallinn University of Technology (Table 1). The sample included 98 students taking part in entrepreneurship courses in the fall semester of 2012. The course lasted throughout an entire semester involving lectures, practical exercises and solving cases using the business planning approach. In terms of disciplines, three categories were constructed: technical sciences (information technology, mechatronics, transportation technology, product development, production engineering, thermal engineering), natural sciences (biology) and logistics. The

sample contains more graduate than undergraduate students in different disciplines. Furthermore, most of the students were male, except those studying logistics (where half were female).

Table 1. The characteristics of the sample

		Count N	Male (%)	Female (%)	Total (%)
1		2	3	4	5
Sample		98			
	Undergraduate	39	65,7	34,3	100.0
	Graduate	59	86,4	13,6	100.0
	Logistics	21	52,4	47,6	100.0
	Telecommunication	7	85,7	14,3	100.0
	Technical sciences	69	88,4	11,6	100.0
	Natural sciences	1	0	100.0	100.0

Source: compiled by the author based on the research database

For the purpose of answering the research question, the Measure of Metacognitive Awareness (MMA), a survey instrument by Haynie (2005) and developed and tested by Ling et al (2013), is extended to involve all three elements of metacompetencies (metacognition, meta-affection and metaconation). The extended instrument initially included 55 statements of which 29 are expressions of metacognition and 26 were designed to measure meta-affective and metaconative components. The respondents were asked to answer the statements by rating each of them on a Likert scale of 1 to 7, where: 1 is equal to "Not very much like me" and 7 "Very much like me".

In order to test if the added statements (26) measuring meta-affective and metaconative components are eligible, a factor analysis (table 2) was conducted. This involved calculating correlation coefficients to determine the strength of dependencies between the statements. The criterion selected for retaining statements was coefficients between .3 and .7. Consequently, three statements below .3 were considered suitable for removal after the factor analysis, which had been conducted using a maximum likelihood analysis with oblique promax rotation on 51 statements (appendix 1) out of which 29 focused on metacognition and 22 either on meta-affection or metaconation. The survey instrument was considered verified at this stage as the statements form four groups of metaconative and meta-affective experiences in accordance to the theoretical framework the statements are based on.

The main aim of the analysis was to evaluate student perceptions of their own experiences using the extended MMA instrument within the framework of three metacompetencies. The results of the analysis allow us to confirm whether the additional 22 statements are suitable for assessing the meta-affective and metaconative abilities of students and how they relate to the statements for metacognition.

Table 2. Factor loadings for statements of metaconative and meta-affective experiences

	Factor			
	1	2	3	4
Metaconative experiences I (based on volition and achievement orientation)				
I never persist very long on a difficult job before giving up*	**.84**			
If the task is too difficult, you do not want even to start with it *	**.67**			
I know that I give up when the situation is against me*	**.60**			
I really can't get much done without the right mood*	**.51**			
I feel that almost everything can be achieved if one wants	**.37**			.30
It is very difficult to force myself to do something when I am not interested*	**.35**			
If there are no procedures given with task, I create them myself for better performance	**.33**			
I make conscientious effort to get out the best results	**.31**			
If I want to do something, I do not let others to distract me much	**.28**			
Metaconative experiences II (based on motivation and self-belief)				
I know that finding new ways to improve things and searching constantly for changes sounds like me		**.67**		
I enjoy finding new solutions		**.57**		
I like new challenges and finding solutions to problems		**.48**		
I follow consciously and will do everything needed to advance my career		**.47**		
Acquiring new knowledge is always interesting for me		**.45**		
I always compare my results with best ones		**.43**		
I cannot be bossed around		**.25**		
Meta-affective experiences I (based on attitudes)				
I am doing my tasks not so interesting ones consciously just to avoid inconveniences			**-.58**	
I enjoy doing these tasks where I can see value in it			**.51**	.43
I feel difficulty in doing things with doubtful sense			**.51**	
It is important to me to see significance and meaningfulness in my tasks			**.43**	
Meta-affective experiences II (based on emotions and feelings)				
In my case, it can be said that "beginning is always difficult"				**.55**
My mood is down when I do not accomplish the result I have set for myself				**.52**
I feel proud of myself when following deadlines				**.51**

Source: compiled by the author based on the research database

The first part of the results evaluates the extent to which student perceptions indicate metacompetencies and how these are distributed within different groups of the sample. In addition, a component-wise (table 3) study of responses will also be analysed.

Secondly, we go deeper into concrete statements to analyse the lowest and highest items in order to suggest possible aspects of metacompetences, which can potentially be influenced through entrepreneurship education courses.

Table 3. The division of components and statements of metacompetencies used in the study

Metacompetence	component	Abbreviations	Numbers of statements
Metacognition	Goal orientation	GO	1-7
	Metacognitive experience	ME	8-12
	Metacognitive knowledge	MK	13-18
	Metacognitive choice	MC	19-23
	Monitoring	M	24-29
Metaconation	Metaconative experience I based on volition and achievement orientation	MCV	30-38
	Metaconative experience II based on motivation and self-belief	MCM	39-45
Meta-affection	Meta-affective experience I based on attitudes	MAT	45-48
	Meta-affective experience I based on emotions and feelings	MAF	49-51

Source: compiled by the author based on the survey instrument and appendix 1

The results of the study have been analysed using linear statistical analysis tools and cluster methods using SPSS21.

4. Results and discussion

4.1. Student perceptions of their metacompetencies

To identify how our students differ in their assessment of their own metacompetencies, the sample was analysed from different perspectives. First, we have to consider that the average agreement with the statements about metacompetencies at 73.2% is rather high.

Table 4. Student self-assessment and agreement with statements about metacompetencies by component, %

	n	GO	ME	MK	MC	M	MCV	MCM	MAT	MAF	total
1	2	3	4	5	6	7	8	9	10	11	12
Sample	98	72,7	68,7	72,7	69,9	73,6	67,0	76,7	79,9	77,8	73,2
Male	78	72,8	69,1	73,4	69,5	72,7	66,9	77,1	79,8	76,2	73,0
Female	20	72,3	66,9	70,2	71,4	76,9	67,3	75,3	80,2	84,3	73,9
Undergraduate	39	70,5	68,6	71,6	70,6	74,7	67,2	77,3	80,8	78,0	73,3
Graduate	59	74,1	68,7	73,5	69,3	72,9	66,8	76,3	79,3	77,7	73,2
Subject											
Logistics	21	70,1	71,3	72,8	72,8	79,4	67,4	78,6	81,8	80,7	75,0
Telecommunication	6	72,4	72,4	81,0	71,9	72,6	69,9	81,0	80,4	69,8	74,6
Informatics	22	71,8	68,3	74,0	73,6	72,4	65,0	78,5	77,8	74,0	72,8
Mechatronics	16	72,2	66,3	69,8	65,9	70,2	67,5	75,8	78,8	78,6	71,7
Thermal engineering	7	73,8	64,5	71,8	61,2	73,1	63,0	73,8	84,2	80,3	71,7
Product development	11	72,7	69,9	69,7	69,9	74,0	67,5	74,4	80,8	82,3	73,5
Production engineering	10	81,0	66,9	76,2	66,3	70,7	69,6	73,7	78,6	81,0	73,8

Source: compiled by the author based on the research database
Notes: calculations are based on means on the scale of 1-"not very much like me" to 7- "very much like me" expressed in percentages on a scale of 0–100%, see abbreviations in Table 3.

One explanation could be that higher order thinking processes are evident among students already focused on study and personal achievements.

Secondly, although the sample of female respondents is remarkably smaller, we can see the similarity in the total value and insignificant differences component wise. Looking through the statements, the only place where female evaluations (61%) were much lower than male (73%), was in response to statement 11 (appendix 2): *I try to break problems down into smaller components,* reflecting metacognitive experience.

We also see no general difference in evaluations between undergraduate and graduate students as graduate students show a slightly higher score in goal orientation, and looking at individual statements, graduate students are more strategic learners, giving 7% higher scores to the statements: *I find myself analysing the usefulness of a given strategy or task;* and, *If there are no procedures given with the task, I create them myself for better performance.*

However, the fact that the main differences occurred between subjects in accordance with the volume of entrepreneurial courses in the curricula was a slight surprise. Logistics and then telecommunications have the greatest access to entrepreneurship education as the department of information technology also has a decent entrepreneurship programme, while technical sciences have the least courses promoting entrepreneurial attitudes. We also see that students of technical sciences have lower scores in metacognition, while meta-affection is high compared with others.

To further study and identify how our students differ in terms of assessing their own metacompetencies, clustering students into groups of high and low level assessments was conducted (Table 5) based on metacognitive, meta-affective and metaconative constructs.

Table 5. Average scores of student self-assessments on the basis of groups of high and low assessments and the components of metacompetencies, %

1	Low level N = 47 2	High level N = 51 3	Difference 4
Metacognition			
Goal orientation	67.9	79.7	11,8
Metacognitive experience	64.7	81.4	16,7
Metacognitive knowledge	65.4	76.4	11,1
Metacognitive choice	67.3	73.4	6,1
Monitoring	64.5	74.5	10.0
Metaconation			
Metaconative experience I (based on volition and achievement orientation)	63,1	72,6	9,5
Metaconative experience I (based on motivation and self-belief)	72,4	79,5	7,1
Meta-affection			
Meta-affective experience I (based on attitudes)	76,6	83,4	6,8
Meta-affective experience II (based on emotions an feelings)	74,6	81,2	6,6

*Note: scores are shown on the scale of 0…100%; (based on Likert scale assessments 1-7) * only statistically significant differences (p<.05) between high and low level assessments are shown*
Source: compiled by the author based on survey results

Looking at these scores more closely reveals that students with high level assessments present higher values in all three subgroups of metacompetencies. Students with higher levels of metacognitive abilities have also reported higher levels in terms of metaconative and meta-affective abilities. So we can conclude that students with lower awareness in one meta-competence possess the same level of awareness also in other types of metacompetencies. This indicates that groups with higher and lower scores might need different approaches to learning, as students who assessed their metacompetencies as lower are in need of extra coaching and guidance.

4.2. Student self-assessments of their meta-affective and metaconative abilities

As these are empirically less studied, we focus more on the constructs of meta-affection and metaconation, analysing and providing more detailed explanations. So for example, the statement "*I feel that almost everything can be achieved if one wants"* (Table 6) has been scored at 88.3% on the measurement scale among students with high level assessments. As students with low level assessments have scored the same statement similarly high (i.e. 84.1%), we can assume students to a large extent employ intrinsic goal orientation, thus believing they are responsible for their own future and success.

If we look at the component structure of metacompetencies (Table 4), the evaluations clearly show the metaconative component of volition as the lowest. Similarly, meta-affection in both components has the highest evaluations. In groups of students with high and low level assessments, however, we can claim that, as expected, those with high-level assessments in metacognition also present higher scores for metaconation and meta-affection, as the same is valid for students with low-level assessments.

Volition is a very complicated construct. In our research it represents "will" expressed in terms of perseverance, achievement orientation and purposefully striving, as in conscious meta-level work at one's own volition. For example, the statements in the first factor (e.g. *I never persist very long on a difficult job before giving up*, *I know that I give up when the situation is against me* or *I really can't get much done without the right mood*) can be grouped as expressions of 'volition' corresponding to the theoretical foundations of the conative component as provided by Koiranen and Ruohotie (2000). However, it is important that the statement *I feel that almost everything can be achieved if one wants* shows cross-loading with the meta-affective component. Although feelings constitute the basis of the meta-affective component, it can be argued that the statement involves striving to achieve and showing contact with the meta-affection competence. Regardless of this, the loading is stronger with the metaconative component than with the meta-affective, expressing volition and intrinsic control over circumstances. In a learning situation, especially when developing enterprising attitudes, this kind of intrinsic purposeful striving loaded with positive feelings has to find support and enhancement.

Awareness of own volition or *will* component is expressed also in next three components being reversed, like "*I know that I give up when the situation is against me".* These statements show, whether a person in situation of complex nature, which in entrepreneurship often occur, is willing to put extra conscious effort or rather takes no action and are therefore metaconative in nature.

Another metaconative component was to evaluate motivation in terms of whether the person is open to new knowledge and challenges; for example, "*I enjoy finding new solutions"*, and noticeable in different options as expressed through statements like, *"I like new challenges and finding solutions to problems"; "I follow consciously and will do everything needed to advance my career"* and also achievement motivation, *"I always*

compare my results with best ones". As these statements of metaconation were scored rather high, we assume that students studying at university already have some ability to motivate themselves. On the other hand, we see that interest, meaning and value of tasks are very important to students. Motivation to learn is greater when students can see the value and meaningfulness in the tasks they have to perform at university.

In surveying meta-affection we used the two-component approach including temperament in terms of attitudes, values and self-esteem, and emotion in terms of feelings and moods of a more temporary nature. One statement, *I feel difficulty in doing things with doubtful sense,* that was rated high (83.1%) expresses high self-esteem and an awareness of the person's own attitudes and values. In a learning situation, doing tasks without understanding the purpose or value usually means that students who are more aware of approaching frustration will seek more information or explanations before starting a task, and that can also be considered an indication of enterprising behaviour.

Emotions or more temporary feelings also have the same importance in learning. High scores (85.4%) were given for the statement: *I feel proud of myself when following deadlines.* Meta-affection lies in noticing and giving praise to one's own accomplishment. Feeling proud provides positive input to self-esteem and motivation and should therefore be encouraged noticing it and practicing it in the learning process. It is interesting that the statements reflecting the importance of task value, significance and meaningfulness, have been scored very high (84.2% and 90.8% among students of both groups with high and low assessment levels) causing us to conclude the presence of student interest in learning and not just being taught.

4.3. Analysis of the statements about metacompetencies that attracted the lowest scores, and which could be influenced through entrepreneurship education

A general overview of the results show that higher scores occurred in relation to metacognition and meta-affection, while lower scores occurred for metaconation (Table 6). The following will discuss those statements with the lowest scores.

At first we review some statements within the construct of metacognition. The statement with the lowest assessment can be found in the goal orientation component: *"I organise my time to best accomplish my goals"* with a mean score of 69.6 among students with high assessments and 58.6 among students with low assessments. This shows a deficiency in time management. Managing time and setting goals and sub-goals are important qualities of enterprising behaviour.

Secondly, we looked at statements that represent the components of metacognitive choice: "*I ask myself if I have learned as much as I could have after I finish the task."* The mean scores among students with high assessments was 70.5 and for students with low assessments was 56.8. The low assessment shows that the students are aware that they do not always learn as much as possible and might choose easier ways to get the task done without making the most of the experience. More explanations can be found when analysing other components involved in metacompetencies.

One of the lowest scores among both student groups (with high as well as with low assessments) came with the statement *"I really can't get much done without the right mood"* (53.3% and 48.6% respectively). The scores were reversed and *not like me* ratings were expected. However, after reversal the means remained low. Moreover, the difference between the scores for these groups of students in response to this statement is statistically insignificant. Even with the word mood referring to affection in the sentence, the statement reflects metaconative volition. Mood here is just a component of disruption, anyhow similarly showing how tied our feelings, thoughts and behaviour are. Such low scores show that

students are rather low in achievement orientation and can be too easily disrupted by difficulties. This argument finds support from another low-rated statement (Table 6) "*I know that I give up when the situation is against me",* again reversed (52%) indicating perseverance or persistence to be rather poor as is luck with striving and conscious effort toward achievement. This could be explained by youthful impatience or the students facing too many challenges. Anyhow, this is something coaching and supervising, adding metacognitive knowledge and showing different available strategies can resolve.

Issues of metaconation can be witnessed as in metacognition – the luck of knowledge or setting goals – as in meta-affection. A closer inspection of the statement *"In my case, it can be said that "beginning is always difficult"* (75.4% and 66.7% among student groups with high and low level assessments respectively) indicates the respondents' awareness of the feeling of difficulty, being meta-affective, so the need for effort to start with a task is consciously understood but without the ability to address the problem, the effort might not follow. Or looking at the statement *"I am doing my unattractive tasks consciously just to avoid inconveniences*" (64%) also seems meta-affective by nature. In life inconvenient situations occur every now and then that are not necessarily emotionally loaded but are a threat to our self-esteem, achievement or goals. Being an enterprising or proactive learner, and accepting that not all tasks can be pleasant and interesting, a person makes an effort and avoids inconveniences. Entrepreneurship education, and surely not only, can systematically work on the proactive behaviour of students to help in setting goals and sub goals and monitoring as well as providing metacognitive knowledge and a toolbox of strategies and choices.

Table 6. Examples of statements from student groups with high and low level of assessments, %.

Metacognition - high	mean	High level	Low level
I often define goals for myself.	81,4	87,9	74,7
I understand how accomplishment of a task relates to my goals	78,9	83,9	73,5
I perform best when I already have knowledge of the task	81,7	85,7	77,7
Metacognition - low			
I organise my time to best accomplish my goals	64,3	69,6	58,6
I challenge my own assumptions about a task before I begin	65,6	71,6	59,2
I ask myself if I have learned as much as I could have after I finish the task	63,9	70,5	56,8
Metaconation - high			
I feel that almost everything can be achieved if one wants	88,3	84,1	79,7
I make conscientious effort to get out the best results	82,3	86,0	78,3
Acquiring new knowledge is always interesting for me	85,6	89,1	81,9
Metaconation - low			
I never persist very long on a difficult job before giving up*	49,0	48,7	49,4
If the task is too difficult, you do not want even to start with it *	56,6	58,7	54,4
I know that I give up when the situation is against me*	52,0	49,3	55,0
Meta-affection - high			
I enjoy doing these tasks where I can see value in it	85,0	88,1	81,9

It is important to me to see significance and meaningfulness in my tasks	87,4	88,7	86,3
I feel proud of myself when following deadlines	85,4	88,7	82,1
Meta-affection - low			
I am doing my unattractive tasks consciously just to avoid inconveniences	64,0	68,0	59,9
In my case, it can be said that "beginning is always difficult"	71,1	75,4	66,7

Source: authors compilation based on survey results

Finally, the results of the survey show how interrelated and overlapping the components and structure of the chosen metacompetencies are. We were able to compose two groups of students with high and low level self-assessments, where those with high level assessments showed higher scores in all three metacompetencies with the same tendency in students with low level assessments showing lower scores throughout all three metacompetencies observed.

In addition, our results indicate that there are no differences gender-wise except in regard to one statement, which also indicated a difference between graduates and undergraduates. Interestingly, differences occurred between curricula. We witnessed higher scores in business administration subjects where entrepreneurship is studied more regularly, and noticeable lower scores in groups of undergraduate students of information technology and mechatronics, who only have access to single entrepreneurship courses. This indicates the importance and influence of entrepreneurship education in the development of enterprising qualities in students.

5. Conclusion

Taken from Ruohotie and Koiranen (2000), one of the main aims of entrepreneurship education is an entrepreneurial person who takes responsibility for his/her own future in order to create a desirable reality. In order to understand how this kind of responsibility develops, we focused our study on the exploration of the new concept of metacompetencies, specifically looking at the extent to which our students' perceptions include metacompetencies (i.e. metacognition, meta-affection and metaconation) and what aspects of metacompetencies seem to be influenced through entrepreneurship education courses.

The task was facilitated by theory development in the form of a tripartite model consisting of cognition, affection and conation as the basis of our research design, originating from Rosenberg and Hovland from 1960, and the assessment of these constructs (Robinson et al. 1991) studied at meta levels.

Our research task was to investigate the extent to which students' perceptions include metacompetencies. We asked students participating in entrepreneurship courses to reflect upon their thoughts and experiences by assessing given statements during their courses. The sample was chosen from among non-economic students primarily from the technical or natural sciences, so the courses in entrepreneurship for most of the respondents were the only ones with an entrepreneurial orientation. The first results indicate that throughout all three metacompetencies we witnessed two main groups divided on the basis of high and low self-assessments with statistically significant differences. The group possessing higher metacognitive abilities also reported higher levels in terms of metaconative and meta-affective abilities. The instrument (worked out by Haynie 2005 and developed by Ling et al. 2013) used to assess metacognition, used in earlier studies, gave us the basis to compare new items and to evaluate the presence of meta-affective and metaconative abilities. While students' perceptions of all three metacompetencies fell into the same pattern, we can conclude that

students evolving higher metacognitive abilities are also more competent at supervising their own affection and conation.

In addition, we found it interesting that the statements reflecting the importance of task value, significance and meaningfulness, have been scored very high. This is rather remarkable; for example, the statement "*I feel that almost everything can be achieved if one wants"* has been scored close to the maximum on the measurement scale among students with high self-assessments and rather high also among students with low self-assessments. On the one hand, we can speculate that studying at university is already an example of enterprising behaviour and students in general evolve intrinsic goal-orientation, and on the other hand, it could be a learned responsibility, and therefore, believing in the importance of being responsible for their own future and success. Items showing the importance of the meaningfulness and interest of studies were also highly scored as the opposite was seen with items expressing feelings related to task difficulty. We can argue that students are aware of their own emotional states and the factors impacting motivation and their willingness to learn.

Investigating what aspects of metacompetences can be influenced through entrepreneurship education courses, a factor analysis was completed, which showed loadings with certain patterns in accordance with earlier theoretical arguments. So the first factor brought together volitional characteristics of metaconation, expressing effort, achievement aspirations and controlling external circumstances. The second factor consisted of motivational aspects of conation like the perceived value of incentives and conscious goals and achievement orientation. The other two factors had meta-affective loadings. The first showing recognized attitudes, and the second, more situational emotion-driven responses, being in concordance with the latest theoretical arguments (Ruohotie and Koiranen 2000, Kyrö et al. 2011). Our research shows the highest evaluation of meta-affection – students being aware of their own emotions and feelings indicates how important it is to consider the meaningfulness of learning and emotions in relation to task difficulty or fear of failure in order to maintain student motivation during the course. The lowest evaluations were given to metaconative items: *when the task is difficult, you don't want to start with it.* Self-motivation and will, according to our students' evaluations, are the most difficult, and we find these to be most urgently in need of development.

This research gave us the confidence that in the learning process, we cannot set a preference on cognition or motivation. We have shown that learning is indeed an integrated function of thinking, feeling, perceiving and behaving in tight interaction and overlapping areas. A lot more research in this area of metacompetencies is needed to create an empirically proved instrument for assessment and to also find a systematic approach to enhance metacompetencies integrated within entrepreneurship curricula.

We note several limitations in our study. First, the shortage of statements did not enable a greater differentiation of metacompetencies with stronger internal validity within the constructs, thereby leaving room for further research. Secondly, there is a need for a deeper qualitative survey to follow the structure and development of metacompetencies and develop a framework for increasing metacompetencies. Further thorough work on the collection of reliable statements will enable us to develop an instrument to assess metacompetencies.

In terms of future research, there is a gap in terms of how to integrate the teaching of the awareness and regulation of metacognition, meta-affection and metaconation within entrepreneurship education and promote student self-regulative abilities. It might be useful to differentiate groups of students based on metacompetencies in order to provide a special approach for less experienced students. It is important in terms of nurturing student enterprising attitudes, increasing their interest in self-employment as well as their better employability after graduation in general.

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Appendix 1

Students self-assessments on the statements of metacompetencies, %

	Mean, %; n=98
1. I often define goals for myself.	81,4
2. I understand how accomplishment of a task relates to my goals	78,9
3. I set specific goals before I begin a task	67,3
4. I ask myself how well I have accomplished my goals once I have finished	71,7
5. When performing a task, I frequently assess my progress against my objectives	71,1
6. I think about what I really need to accomplish before I begin a task	73,9
7. I organise my time to best accomplish my goals	64,3
8. I challenge my own assumptions about a task before I begin	65,6
9. I ask myself questions about the task before I begin	68,3
10. I try to translate new information into my own words	68,1
11. I try to break problems down into smaller components	70,9

12. I focus on the meaning and significance of new information	70,6
13. I try to use strategies that have worked in the past	77,0
14. I use different strategies depending on the situation	78,3
15. I am good at organising information	71,7
16. I know what kind of information is most important to consider when faced with a problem	68,4
17. I consciously focus my attention on important information	73,9
18. I am aware of what strategies I use when engaged in a given task	67,0
Metacognitive knowledge	72,7
19. I think of several ways to solve a problem and choose the best one	76,9
20. I ask myself if I have considered all the options when solving a problem	69,0
21. I ask myself if there was an easier way to do things after I finish a task	70,3
22. I ask myself if I have considered all the options after I solve a problem	69,4
23. I ask myself if I have learned as much as I could have after I finish the task	63,9
24. I perform best when I already have knowledge of the task	81,7
25. I periodically review to help me understand important relationships	75,3
26. I stop and go back over information that is not clear	76,4
27. I find myself analysing the usefulness of a given strategy while engaged in a given task	68,0
28. I find myself pausing regularly to check my comprehension of the problem I situated at hand	69,4
29. I ask myself questions about how well I am doing while I am performing a novel task. I stop and re-read when I get confused	70,9
30. I never persist very long on a difficult job before giving up*	49,0
31. If the task is too difficult, you do not want even to start with it *	56,6
32. I know that I give up when the situation is against me*	52,0
33. I really can't get much done without the right mood*	63,4
34. I feel that almost everything can be achieved if one wants	84,1
35. If there are no procedures given with task, I create them myself for better performance	74,0
36. I make conscientious effort to get out the best results	82,3
37. If I want to do something, I do not let others to distract me much	74,4
38. I know that finding new ways to improve things and searching constantly for changes sounds like me	75,9
39. I enjoy finding new solutions	82,7
40. I like new challenges and finding solutions to problems	80,4
41. I follow consciously and will do everything needed to advance my career	70,7
42. Acquiring new knowledge is always interesting for me	85,6
43. I always compare my results with best ones	75,6
44. I cannot be bossed around	66,3
45. I am doing my unattractive tasks consciously just to avoid inconveniences	64,0
46. I enjoy doing these tasks where I can see value in it	85,0
47. I feel difficulty in doing things with doubtful sense	83,1
48. It is important to me to see significance and meaningfulness in my tasks	87,4
49. In my case, it can be said that "beginning is always difficult"	71,1
50. My mood is down when I do not accomplish the result I have set for myself	77,0
51. I feel proud of myself when following deadlines	85,4

Note: Assessment on the scale 1- "not very much like me" and 7- "very much like me" and expressed in percentages on the scale of 0-100%
Source: Authors' compilation on the basis of the database

Article II

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How Entrepreneurship Education Can be Developed Knowing the Power of Metacognition

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Abstract

Metacognition as a concept has been thoroughly studied and its effect on learning is well demonstrated. Moreover, scholars find that it represents the entrepreneurial approach to thinking and has the propensity to affect selecting an entrepreneurial career. Hence, entrepreneurship education, still the subject of discussions about its aims methods and outcomes, has not taken any visible advantage of this powerful concept, and no specific advice for educators has been delivered. To rectify this deficiency, the aim of the current research is to propose how entrepreneurship education can be developed to increase metacognitive abilities in students. Individual differences in student metacognition are therefore studied, and the strongest and weakest aspects are identified using quantitative and qualitative research methods. Based on the theoretical framework of the conceptualisation of metacognitive abilities as well as empirical evidence, the article contributes to a better understanding of the connections between metacognition and educational settings. The article provides a practical holistic proposal for how metacognitive abilities can be developed systematically through entrepreneurship courses.

JEL classification codes: I23, L26
Keywords: entrepreneurship education, metacognition, intervention, learning activities, teaching methods

1. Introduction

The impact of entrepreneurship programs is still under dispute (Fayolle & Gailly, 2013), and according to Frechner and Weber (2013), research into entrepreneurship should provide more than just mean values, giving more practical recommendations for educators (Frechner & Weber, 2013). They discuss whether we are comparing apples with oranges, and recommend distinguishing programs in higher education according to awareness and start-up concepts. Start-up programs try to imitate entrepreneurial tasks, and in many cases aim to increase entrepreneurial intention (Liñán & Chen, 2009; Pittaway & Cope, 2007; Souitaris et al., 2007). Those that aim at building awareness, we see as creating an awareness of the entrepreneurship phenomenon in terms of beliefs and attitudes to promote enterprising behaviour and the ability to cope with a variety of tasks in changing environments.

Looking closer the second, studies show that increased awareness about one's thinking patterns relates to greater success in entrepreneurship (Ku & Ho, 2010), and better results in critical thinking, which is facilitated by metacognition (Magno, 2010; Willingham, 2007; Flavell, 1979). Metacognition is addressed in several studies (e.g. Mitchell et al., 2005; Haynie et al., 2010) aiming to explain the relationship between the conscious guidance of one's reasoning patterns, the propensity to embark on entrepreneurial careers and cultivating the necessary mind set. Moreover, Mitchell et al. (2005) claim that metacognitive thinking can be deliberately practiced in the entrepreneurial context, leading to the creation of entrepreneurial expertise. Universities serve to a large extent as a source for developing future entrepreneurs, a general consensus highlighted by Dickson et al. (2008), indicating a significant and positive relationship between education and entrepreneurial performance. Students, knowing their own strengths and weaknesses, can adjust their thinking so as to be more diverse, and from this, it is claimed that a metacognitive knowledge of strategies as well as self-knowledge is linked to student performance in the classroom (Pintrich, 2002). Therefore, the special strength of universities lies in their ability to develop higher-level skills and nurture analytic abilities in students (Anderson, 2011). This, however, creates the challenge for entrepreneurship teachers and trainers to find innovative learning methods that coincide with the requirements and expectations of the aims of entrepreneurship education to develop entrepreneurial competencies, enterprising behaviour and metacognition. Moreover, disregard for existing research findings confirming that students who have received metacognitive instructions will obtain entrepreneurial skills faster than those who have not (Mitchell et al., 2005), the question then arises of how such expertise is developed. Researchers (Urban, 2012; Vos & de Graaff, 2004) have pointed out that the relationship between active learning approaches and the development of metacognitive abilities in students is in need of further elaboration. Indeed, descriptions of instructions for teaching metacognition or explanations of methodology are not clear in the literature, so that the question of which techniques have caused improvements in metacognitive awareness or how were improved learning results technically achieved remains unanswered.

So what is the best configuration of available resources for improving the awareness of metacognitive abilities in students so that entrepreneurship is fostered and people who are more aware and more responsible for their own thinking, learning and behaviour, could perform better not only in studies or in entrepreneurship but also in life in general.
Drawing from this, the current problem for research is that despite having proven that the power of metacognition contributes to learning (Baker, 2008), the implications and practical recommendations for entrepreneurship education are missing (Urban, 2012).

The aim of this research is to identify how entrepreneurship education can be developed to increase student metacognitive abilities. This will be pursued through analysing the needs of students for the development of their metacognitive abilities and providing concrete directions for educators and trainers in the field of entrepreneurship that they can work with when implementing metacognitive interventions. In order to achieve this, the following research questions are formulated:

1) How is metacognition identified among students?
2) How can we develop entrepreneurship education that aims to increase metacognitive abilities in students?

Therefore, this paper focuses on the missing link between the rather excessive conceptual discussion, progress in assessment, and practical use of metacognition in the learning process. Understanding how to embed the development of metacognition within entrepreneurship courses provides input for further research to expand this know-how to cover other metacompetencies.

The current research begins by presenting the theoretical framework behind the conceptualisation of metacognition while emphasizing entrepreneurial metacognition, learning strategies and activities enhancing the development of metacognitive abilities in students in universities as a basis for empirical research. The data and methodology are then presented. Finally, the results of the study are discussed, giving recommendations for the development of courses on entrepreneurship education. The paper concludes with a discussion of the limitations of the research and proposals for future research.

2. Theoretical framework

2.1. Research on metacognition

In order to build up curricula enabling the development of metacognitive awareness and skills in students, clear and consistent conceptualisations of metacognition will be useful (Schraw, 1998; Veenman et al., 2006). The following will discuss the various angles on and conceptualisations of metacognition.

Research on metacognition can be dated back to 1979 when Flavell described it as higher order cognitive ability, the recognition of one's own thoughts and abilities, tasks, situations and environments. In learning situations, it expresses the ability to reflect, understand and control one's own study processes (Schraw & Dennison, 1994) as in the entrepreneurship context it is proposed to be a basis for entrepreneurial decision-making (Mitchell et al., 2005). Metacognitive awareness is associated with information active in one's working memory and with social interaction, and the need to communicate our thoughts to others or to understand and judge the thinking of others (Efklides, 2008; Fernandez-Duque et al., 2000). It is connected with planning and consciously executing appropriate actions to achieve a particular goal (Sheorey & Mokhtari, 2001). Somewhat different conceptualisations (Table 1) exist with simultaneous interest in the phenomenon of metacognition in a variety of areas and specialist fields. The origins of these definitions stem from developmental psychology (Flavell, 1979), educational psychology (Schraw & Dennison, 1994), and education (Hacker, 1998), and have later been considered for study by entrepreneurship scholars (Mitchell et al., 2005; Haynie, 2005). Efklides (2008) again represents cognitive psychology, and in later works, her interest

can be observed to turn towards affective and motivational relationships to metacognition as part of self-regulative behaviour (Efklides, 2011).

Having carefully studied all avenues of research on metacognition, this work will be based on Haynie's (2005) empirical study in the context of entrepreneurship. His development relies on earlier conceptualisations by Flavell, and a measurement instrument modified for use in the entrepreneurship field based on Schraw and Dennison (1994). An instrument to be used in entrepreneurship was also developed by Haynie (2005), and further modified in the context of entrepreneurship education by Ling et al. (2013; 2015). The latter instrument is used in this empirical research. Furthermore, Baker (2008) asserts that the best measures for assessing metacognition are considered self-reflections – firstly, verbal, interviews, learning diaries and so on, and secondly, survey instruments that include multiple response options to a series of items. After exploring the range of survey intruments available, it is evident that most questionnaires are domain specific (Baker, 2008).

Table 1. Constructs of metacognition in research

Flavell (1979)	Metacognition	Model of cognitive monitoring Metacognitive knowledge Metacognitive experiences Goals or tasks Actions or strategies
Schraw and Dennison (1994)	Metacognitive awareness	Knowledge of cognition Declarative knowledge Procedural knowledge Conditional knowledge Regulation of cognition Planning Information management strategies Comprehension monitoring Debugging strategies Evaluation
Hacker (1998)	Metacognition	Metacognitive awareness Metacognitive experience Metacognitive skill
Mitchell et al. (2005)	Metacognitive awareness	Understanding of metacognitive strategies Metacognition about self and others Normative metacognition Long-term metacognitive beliefs
Haynie (2005)	Metacognitive awareness	Model of cognitive adaptability Goal orientation Metacognitive knowledge Metacognitive experience Metacognitive choice Monitoring
Efklides (2008)	Metacognition	Metacognitive experiences Metacognitive knowledge Metacognitive skills Orientation strategies Planning strategies Strategies for regulating cognitive processing Strategies for checking (monitoring) the implementation of planned action Strategy for evaluation of the outcome of task processing Strategy for recapitulation and self-regulation

Source: Compiled by the author based on literature

In the entrepreneurship framework, metacognition is seen as part of a larger and more inclusive construct of executive functioning, an important component of the cognitive system, specifically associated with processes of mental control (Haynie, 2005) affording adaptable cognitive functioning in complex and dynamic environments. Therefore, the five dimensions from Haynie that enable such functioning will be discussed in association with conceptualisations from other authors.

According to Flavell (1979), goals or tasks refer to the objectives of a cognitive enterprise where the person sets the proper goal(s) for task processing. This involves strategies such as asking oneself questions on the requirements of the task, on comprehension, and on possible caveats, contradictions, or missing information that may hinder understanding the task (Efklides, 2009). Efklides also suggests that planning strategies may involve the establishment of sub-goals and their sequencing, the sequencing of procedures, time schedules, check points for monitoring the progress of work done, and going back and forth while reading the instructions. It involves drawing diagrams, using symbols, producing tables, underlying the main ideas, and figuring out possible interrelations. As Pintrich (2002) notes, goal setting can occur at any point during performance.

Moving on from goal setting, the second dimension, metacognitive knowledge, consists primarily of knowledge or beliefs about what factors or variables act and interact in what ways to affect the course and outcome of cognitive enterprises (Flavell, 1979). It refers to one's conscious and cognitive understanding of people, tasks and strategy. Metacognitive knowledge reflects perceptions about oneself (knowledge of self), and about others in terms of competencies, weaknesses, how people think, comprehend and use memory. There are various degrees and kinds of task comprehension options like attending, remembering, communicating, problem solving as well as strategic components like evaluating where to pay particular attention, and looking up the main points and trying to repeat them to yourself in your own words (Flavell, 1979). Flavell also points out that how well you understand something now, may not be an accurate predictor of how well you will understand it later. Nevertheless, it has been shown that students that know about the different kinds of strategies for learning, thinking, and problem-solving, will be more likely to use them.

Metacognitive experience is an important metacognitive resource that can provide input that activates metacognitive skills, controlling action and behaviour. It consists of individual experiences based on cognitive activity and serves as a conduit through which previous memories, intuitions, and emotions may be employed as resources given the process of making sense of a given task (Flavell, 1987; Efklides, 2009; Haynie et al., 2010). Flavell's (1979) guess at that time was that metacognitive experiences are especially likely to occur in situations that stimulate a lot of careful, highly conscious thinking: in a job or school task that expressly demands that kind of thinking, in novel roles or situations, where every major step taken requires planning beforehand and evaluation afterwards. However, Haynie et al. (2010) hold it is important to note that knowledge and experiences can only be characterized as metacognitive in cases when the individual has an awareness of how that knowledge or experience relates to formulating a strategy to process the task at hand. Then this awareness should also be expanded to the emotions, feelings and attitudes, which along with motivations are part of affective learning, distinctively stated by Efklides (2008) as a crucial part of metacognitive experience in helping to estimate effort and time expenditure, and the correctness of the solution. Tasks far above or below a person's competence level cause negative feelings inhibiting the use of metacognitive knowledge and self-regulation.

Metacognitive choice is a component added by Haynie (2005), defining the selection of what is perceived to be the most appropriate cognitive response (based on motivation and the environment), from a set of available cognitive responses (Haynie et al., 2010). Flavell (1987: 23) noted:

"…while a cognitive strategy is simply one to get the individual to some cognitive goal or sub-goal…the purpose (of a metacognitive strategy) is no longer to reach the goal, but rather to feel confident that the goal has been accomplished."

He explains that skimming a set of directions to get a rough idea of how hard they are going to be to follow or remember is a metacognitive strategy. Another is to paraphrase aloud what someone has just told you to see if she will agree that that is, in fact, just what she meant. A third is to add a column of figures a second time to ensure that your total is accurate. Generating alternative ways to create cognitive strategies and choosing among them is a choice of metacognitive nature (Haynie, 2005).

Finally, monitoring, considered to be characteristic to metacognition, and especially needed in entrepreneurial activities (Mitchell et al., 2005), is a continuous process representing seeking and using feedback to re-evaluate and adapt motives, metacognitive resources, and the formulation of metacognitive strategies appropriate for managing a changing environment (Haynie et al., 2010). Mitchell et al. (2005) and Haynie et al. (2010) all suggest that metacognitive monitoring allows the entrepreneur to reflect on how, why, and when to use certain strategies (as opposed to others), given a changing environment, but also his or her own motivations. For example, one aspect of metacognitive monitoring is the recognition of task demands, such as the complexity of a perceived business opportunity. This involves monitoring compliance to the planned sequence of processing and the time schedule that was set, detection of errors and/or delays in execution, detection of discrepancies between actions and the plan, checking the appropriate application of strategies or the use of instruments, tools, and so on (Efklides, 2008). They also involve the identification of new needs that arise from the implementation of the plans, particularly if there is need for more input and revision of the planning (Kuhn, 2000). Part of the monitoring is also an evaluation of the outcome of task processing. Evaluation strategies involve an appraisal of the outcome of the cognitive processing vis-à-vis previously established criteria or standards that pertain to their quality (Veenman & Elshout, 1999). They may also involve strategies for the evaluation of the quality of planning, regulation, and implementation of strategies that were used to monitor task processing.

The multidimensionality of metacognition as a phenomenon, argued here earlier, makes the research complex and interdisciplinary (Flavell, 1979). The Journal of Metacognition and Learning involves myriad studies where researchers find it more comfortable to focus on narrow aspects of metacognition like using the metacognitive strategies of children in reading or learning maths, languages etc. However, a general consensus has been established in the core understanding about the difference between cognition and metacognition (Schraw, 1998). Although these terms overlap, cognition refers to performance while metacognition refers to understanding how the task was performed, the key or central difference lies in awareness (Fernandez-Duque et al., 2000). This serves as a key element that is subject to training when considering an intervention.

Our focus will now turn to factors supporting the enhancement of metacognitive abilities. A challenge lies in integrating the metacognitive component of training with entrepreneurial skill development taking into account the diversity within teaching strategies, learning styles and curricular design that universities have introduced.

2.2. Exploring methods for metacognitive intervention

Evidence from the early 2000s that metacognitive intervention is effective is so strong that disciplinary organisations and national panels recommend that metacognition should be included in teacher preparation and classroom curricula (Baker, 2008). The concept has found broad support and its inclusion in Bloom's taxonomy has now been widely accepted by scholars in the field (Krathwohl, 2002). The importance of metacognition is equally beneficial to students with lower and higher intellectual abilities, as it has been found that weaker students benefit even more (Rahman, 2010). But not all students can develop the awareness or monitor their own learning without external help.

The challenge for entrepreneurship teachers and trainers is to find innovative learning methods that coincide with the requirements of potential entrepreneurs (Henry et al., 2005). Although Mitchell et al. (2005) argue that findings confirm that students who have received instructions on metacognition will obtain entrepreneurial skills faster than those who have not, they do not reveal the content of the intervention or educational tools used. Therefore the need for such tools and more practical advice remains.

When looking for a systematic approach to enhance metacognitive awareness or methodology, in earlier research by Schraw and Moshman (1995), it was advised that metacognitive theorizing can be facilitated by self-talk and peer interactions that focus on the process rather than the product of learning (Table 2). The strategy evaluation matrix (SEM) proposed by Schraw (1998), offers suitable strategy samples of how, when and why to use certain strategies like skim, slow down, activating prior knowledge, mental integration and diagrams. He presents four instructional strategies, including promoting general awareness, improving self-knowledge, regulatory skills, as well as promoting learning environments that are conducive to the construction and use of metacognition.

Table 2. Compiling instructional recommendations for metacognitive intervention

Authors	Aim	Activity
Schraw and Moshman 1995	on procedural knowledge	self-talk and peer interactions
Schraw 1998	strategy evaluation (SEM)	skim, slow down, diagrams
White and Frederiksen 2005	creating and reflecting understanding	collaborative inquiry and discussion
Veenman 2006	maintained application of instruction	over-disciplinary curricular orchestration
Downing et al. 2008	metacognitive choice	problem-based learning (PBL)
Sandi-Urena et al. 2011	ability to solve problems	collaborative intervention reflection
Wheadon and Duval-Couetil 2014	reflecting on knowledge, experience and activity	business plan

Source: Compiled by the author based on literature

Veenman et al. (2006) suggested three fundamental principles of successful metacognitive instruction to be practiced in educational programs: embedding metacognitive instruction into the content matter to ensure connectivity; informing learners about the usefulness of metacognitive activities to make them exert the initial extra effort, and prolonged training to guarantee the smooth and maintained application of metacognitive activity. The latter also suggests these principles are successful only in the case of good cross-disciplinary curricula orchestration within the university and high awareness of metacognition among lecturers as a norm. However, this is still considered a strategic proposition, not a concrete methodology.

After a study lasting fifteen months and three semesters, Downing et al. (2008) demonstrated dramatic improvements in metacognition in a PBL (problem-based learning) group in different curricular environments. Analysis of student learning experience, measured at the end of the programme, revealed that the PBL group reported significantly higher scores in their overall course satisfaction and generic skills development. Vos and de Graaff (2004), on the other hand, argue that PBL together with POL (project organised learning), both models relying on didactic principles such as discovery learning, learning-by-doing, experiential learning and student-centred learning. The most important difference between PBL and POL seems to be the style of problem treatment as, for example, in a PBL setting students analyse an ill-defined problem in order to define their own learning goals (Vos & de Graaff, 2004). They admit that solving the problem is still a means, not the goal. Like learning-by-doing, PBL approaches, and others of this kind, have not always focused on the development of metacognition and not considered improvement in all the components suggested by research.

Sandi-Urena et al. (2011) confirm earlier aspects, where they reported that collaborative intervention, involving metacognitive reflection, helps to increase student ability to solve problems. They also suggest that more meaningful and purposeful social interaction facilitates metacognitive development and awareness. Indeed, encouraging social interactions between students and sharing experience is a beneficial tactical approach, especially in more individualist parts of the world.

Besides, Wheadon and Duval-Couetil (2014), in their study with engineering students, demonstrate how the business planning process can be purposefully set as a fully collaborative experiential, metacognitive exercise. Business plan development includes the critical evaluation of factual knowledge, planning and monitoring processes, awareness of declarative and procedural knowledge needs, and own knowledge, and reflecting on findings, and discussing different strategic options as examples of how to use this common tool for creating an awareness of entrepreneurial tasks and business creation with built-in metacognitive exercises.

Finally, the undeniable role of reflection in entrepreneurship education has to be stressed. By employing reflective thinking skills to evaluate the results of one's own learning efforts, the awareness of effective learning strategies can be increased and ways of using these strategies in other learning situations can be understood (Ertmer & Newbe, 1996) and reflective practitioners developed (Jack & Anderson, 1999). So we can even say that reflection makes metacognition possible.

Based on Schraw (1998), there are common ways to increase metacognition in classroom settings, such as promoting a general awareness of the importance of metacognition, improving knowledge of cognition, improving the regulation of cognition and fostering environments that promote metacognitive awareness. His preference is an interactive instructional approach that blends direct instruction, teacher and expert student modelling, reflection on the part of the students, and group activities that allow the students to share their knowledge about

cognition – everything we find in use a decade later. Hence, the list is far from complete and conscious creative experimenting with existing classical methods (e.g. case studies, feasibility analysis, interviews) may be designed to promote metacognition.

To that end, there has to be an awareness of the individual differences between students in terms of metacognition. Further, the study proceeds with the current strengths and especially weaknesses of students, and careful reading of their reflections. Synthesizing the recommendations above makes it possible to draft recommendations for the development of entrepreneurship education programs as enhancing student metacognitive awareness as a valuable addition.

3. Research methodology

The empirical study for this paper was carried out among undergraduate and graduate students in different disciplines at Tallinn University of Technology in 2012 (Table3). We collected our data from non-economics students before they had taken any of the entrepreneurship courses. We asked students to rate their metacognitive abilities using MMA (measure of metacognitive abilities), a survey instrument based on Schraw and Dennison (1976), and developed by Haynie (2005) for use in the entrepreneurship context. This instrument has been slightly adjusted for Estonian students by Ling et al. (2013). In this survey, the instrument was piloted a second time among our students using 7-step Likert scales and including 29 individual statements. The sample consisted of 190 respondents where nearly two-thirds (65%) were male and most of them (86%) studying technical and natural sciences.

Table 3. Sample of the empirical study

	Count	Share in the sample (%)
1	2	3
Male	124	65.3
Female	66	34.7
Undergraduate	81	42.6
Graduate	109	57.4
Logistics	26	13.7
Natural sciences	61	32.1
Technical sciences	103	54.2

Source: Compiled by the author

Respondents gave answers to statements by rating them on a scale of 1 to 7 where 1 was equal to "Not very much like me" and 7 "Very much like me". For the purpose of establishing whether the respondents with different levels of metacognitive abilities also evolve different levels of entrepreneurial intentions, we additionally studied career aspirations as a prognosis immediately after graduation and after a five-year period. Linear statistical analyses have been utilised at this stage in the analysis.

The main focus was on investigating differences between students based on metacognitive abilities. In order to accomplish the classification of students into different groups, a K-means clustering methodology is used. Clustering is used to group the objects in a way that one cluster

consists of objects as similar as possible, making it possible to distinguish them from objects in other clusters. The similarity function chosen for this research was Euclidean distance, which was compatible with the Likert scale. As a result, all respondents were grouped with most similar students. This new information was then added as a new attribute to every person in database, allowing to perform a follow-up analysis of every such an object or cluster. Clustering makes it possible to identify groups of students possessing distinct levels of metacognition, and establishes a base for further comparisons.

The further quantitative study focused on the aspects of metacognitive abilities scored highest and lowest by more than ten per cent of the students in order to explore how students differed in specific components of metacognition.

Finally, a qualitative survey was carried out in order to analyse and explain the findings of the quantitative results. The choice was to conduct in-depth interviews with a randomly selected group of students in order to retrieve explicit information related to those statements that scored lowest in the measure of metacognitive abilities (MMA). In addition, this step aimed to analyse student reflections in respect to any improvement in the entrepreneurship training. The interviews were conducted with four students participating in the student enterprise practice, who had exhibited stronger intentions to found a company and greater interest in developing their knowledge of entrepreneurship. The content analysis was used in order to better understand student opinions about the constructs of metacognition to provide recommendations for learning strategies in university entrepreneurship courses with a focus on improving student metacognitive awareness.

4. Discussion of results

4.1. Assessing students' metacognitive abilities

The first section of the analysis explores the differences between students based on metacognition. After identifying groups of students differing from each other based on metacognitive abilities, these were clustered into three groups using a K-means methodology (Table 4). Looking at the characteristics of these groups, it is evident that average scores in the first cluster (1) are significantly higher in all five components of the metacognitive abilities compared to the others. The same pattern, albeit with a lower means, can be seen in clusters two and three with a declining tendency. Based on the clear pattern, we can draw the conclusion that students with stronger scores for metacognition are generally stronger in all components, and vice versa, students with lower scores are equally lower in all aspects of metacognition.

When looking for differences between males and females, in cluster 1 it is apparent that among the males only the metacognitive experiences component is stronger than among females (5.5 and 5.2 respectively), while in cluster 3 with the lowest scores, females perform significantly lower in most components of metacognition. This might be due to the rather small number of students in the cluster. Although goal setting skills are the strongest among both females and males (5.8 and 5.6 respectively), the difference between them is not significant. However, we see at this point the biggest discrepancy between the first (1) and last (3) clusters. Based on these results, which suggest that gender does not have an effect on the level of metacognitive awareness, this study does not concur with the literature in this field (Memnun & Akkaya, 2009; Rahman, Jumani et al., 2010).

Table 4. Classification of students based on the metacognitive abilities of students using the K-means clustering method

	Cluster1 (N=104)	Cluster2 (N=62)	Cluster3 (N=22)
	Mean (male /female)		
Metacognitive abilities			
Goal Orientation	5.7 (5.6/5.8)	4.8 (4.7/4.8)	3.6 (3.6/3.7)
MC knowledge	5.3 (5.2/5.5)*	4.5 (4.5/4.6)	4.2 (4.5/3.2)*
MC experience	5.4 (5.5/5.2)*	4.7 (4.8/4.6)	4.2 (4.3/3.6)*
MC choice	5.5 (5.5/5.5)	4.4 (4.3/4.5)	4.1 (4.3/3.4)*
Monitoring	5.5 (5.5/5.6)	4.8 (4.8/4.7)	4.2 (4.3/4.0)

Note: *depicts statistically significant differences between males and females, α=0.05
Source: Descriptive statistics of survey database; author's compilation

Nevertheless, it is significant that more than half (55%) of the students belong to the group of metacognitively high-scoring students (1). This suggests that the largest portion of students regardless of gender, are able to control and monitor their metacognitive functioning. In parallel, there is only a limited amount (12%) of students reporting less developed abilities (i.e. cluster 3). Still, when evaluating the magnitude of inter-cluster differences, then based on the standard deviation the students in cluster 2 seem to be on average more similar to the high-achieving students. Moreover, the differences between males and females in cluster 2 do not reach statistical significance in any metacognitive component allowing us to assume the average values are equal.

The following discussion attempts to go deeper into the details of the components of metacognition, to identify more specifically the deficiencies in different students' metacognitive abilities in terms of individual components. For example, aspects of goal orientation in this study are represented as having the highest and also the lowest level. This is an interesting aspect to investigate within the interviews in the last phase of the study. These results serve as a source of information and a basis for suggestions on the need for different training approaches for students according to their characteristics and how the entrepreneurship training needs to be improved, so that the students would be metacognitively more skilled; that is, manage uncertainty better and be more successful in their professional careers.

To start with an insight into the strongest aspects (Table 5) of metacognition is presented. Students declare goal setting (M1, mean 5.6) to be 80% of the case on average with 79% understanding the relationship between goals and accomplishments (M2 mean 5.5). Similarly, in relation to items of metacognitive knowledge (M6), where students are quite positive (81%, mean 5.7) that when solving problems they weigh between several options and are sure that having sufficient knowledge leads to the best performance (M10). The strongest statements of metacognitive experience reflect that 76% (mean 5.3) of students think about what they actually need to accomplish before starting (M17) and to the same extent use different strategies (M18). On average 79% (mean 5.5) of students, on not finding clear information, go back and add clarifications (M31), thereby demonstrating an awareness of using monitoring in their own learning process.

Table 5. Strongest aspects of the metacognitive abilities in students

	Mean
Goal orientation	
M1. I often define goals for myself	5.6
M2. I understand how the accomplishment of a task relates to my goals	5.5
Metacognitive knowledge	
M6. I think of several ways to solve a problem and choose the best one	5.7
M10. I perform best when I already have a knowledge of the task	5.6
Metacognitive experience	
M17. I think about what I really need to accomplish before I begin a task	5.3
M18. I use different strategies depending on the situation	5.3
Monitoring	
M31. I stop and go back over information that is not clear	5.5

Note: Means of Likert-7 Scale. Shown aspects rated highest by the largest amount of students
Source: compiled by the author based on survey results

However, we have set the focus of the current study on the development of entrepreneurship education using the means of metacognition, and are therefore even more interested in exploring the weaknesses to pay more attention to the design of interventions.

Here the focus will now turn to analysing individual statements by 77.4% of the respondents that scored the lowest (Table 6). Based on this, there is room for the development of metacognitive abilities in all aspects in terms of some components, except metacognitive experience as the deficiencies regarding this component were reported by a relatively smaller group of students compared to others.

Table 6. Weakest aspects of metacognitive ability in students (mean and % of respondents)

	Mean	Male	Under-grad	Gradu-ate	Nat. Sc	Tech. Sc
1	2	3	4	5	6	7
Goal orientation						
M4. I ask myself how well I have accomplished my goals once I have finished	4,9	13.7		10.5		10.5
M19. I organise my time to best accomplish my goals	4,9	13.2		12.1		
MC knowledge						
M7. I challenge my own assumptions about a task before I begin	4,5	16.3	14.7	11.1		12.6
M13. I ask myself questions about the task before I begin	4,8	12.2		10.1		
M14. I try to translate new information into my own words	4,9	13.2		11.1		10.0
MC choice						
M27. I ask myself if I have considered all the options after I solve a problem	4,8	10.0		10.5		
M29. I ask myself if I have learned as much as I could have after I finish the task	4,6	14.7		14.7	10.0	10.5
Monitoring						
M33. I find myself analysing the usefulness of a given strategy while engaged in a given task	4,6	12.1		10.5		

Source: Compiled by the author based on survey results

When comparing the goal orientation statements that scored the lowest to those that scored the highest, we can see a meaningful difference between achievement orientation on the one hand, and hence, at the same time not questioning one's own standards or use of time. This can be explained by the standards set by lecturers/teachers and the same with fixed homework timetables. Students may not feel they have control over the development of their own actual potential, performance standards, and use of time as far as they do what is expected from the course plan. In entrepreneurship, individual management and control of one's own performance and time resources is of high importance and should be foreseen as part of entrepreneurship education.

Looking at the data, we can see that an aspect in relation to the ability to question one's own assumptions (M7) is equally problematic both for undergraduate and graduate students. When comparing again the lowest rated statements to the highest, we can see a substantive difference. On the positive side, students are aware of the connection between knowledge and performance and that there are several options worth considering, but they lack the ability to question their own sources of knowledge and have a low level of conscious control over their own performance.

Metacognitive choice being low indicates the use of their own available resources in a more automatic manner. Creating an awareness of choice leads to more open searches for new information and options.

When monitoring the strongest aspects, we see that understanding information can be monitored more easily as a retrospective self-assessment, but monitoring their own learning or development, is on the contrary, positioned at the other end of the scale or is not a habit.

In conclusion, from the perspective of statistics, we can propose that the greater the probability of having less developed metacognitive ability is related to male graduate students studying technical sciences. A comparison of the statements with the strongest and weakest scores highlighted an interesting pattern that although students have a clear achievement orientation, and set general goals, when looking for ways to achieve them, on other hand, they lack the ability to analyse, question and challenge their own learning and achievement.

4.2. Understanding metacognition

In order to investigate in more depth, and to explain the results of the quantitative survey, in-depth interviews were conducted with students randomly selected from the survey sample. The students interviewed were developing a business idea with good entrepreneurial potential and were interested in becoming an entrepreneur. Therefore, it was a rather remarkable finding that these students possessed the same weaknesses that the quantitative study pointed out. Students admitted having general goals in mind and aiming to achieve them, although it turns out that this is not an entirely conscious or controlled process.

From the interviews (Table 7) we find students defining own goals (M1) generally connected to career planning (R1, R2). Two students, however, also display sub-goals coming from life events that were important for them, like sports (R4) and a baby (R3). For that reason, we realise that setting sub-goals does not come from awareness, or from an inner will, but from necessity or external circumstances. This supports the survey results, and adds the idea that if not learned earlier, sometimes life events support or motivate better planning.

Table 7. Student opinions selected from interviews supplementing the strongest survey statements

Survey statements	Interview statements
Goal orientation	
M1. I often define goals for myself	I would like to work for Texas Instruments (R1)
	... in three years I should have my own company established (R4)
	... set how many points I should make in this summer in sports (R4)
	I have short and long-term goals - a child is really life changing (R3)
M2. I understand how the accomplishment of a task relates to my goals	... plan to do my MBA and then start my own business - so far it is working (R2)
	... finish courses I decided to pass tasks at the first test (R3)
Metacognitive knowledge	
M6. I think of several ways to solve a problem and choose the best one	I have seen how some things are done ... (R1)
M10. I perform best when I already have knowledge of the task	I have found you can get everything from school (R3)
	... maths skills were very useful I could not manage without (R4)
Metacognitive experience	
M17. I think about what I really need to accomplish before I begin a task	... was at career advisor, completed tests - so I picked the subject (R1)
	... to get a scholarship, grades need to be kept in mind (R1)
M18. I use different strategies depending on the situation	... all written tasks in university are based on earlier experiences (R2)
Monitoring	
M31. I stop and go back over information that is not clear	... now I check when I have a goal, but not earlier ... just got things done (R3)

Source: Compiled by the author based on survey results and interviews

The second aspect of goal setting (M2) which was rated well, supports the earlier discussion about the general ability of students to evaluate their progress towards their goal. But as comments indicate it is just aiming at passing tasks at first attempt, to be done with it. These evaluations are not ambitious or aim at conscious self-development. The same applies to metacognitive knowledge (M6 and M10), where students appreciate earlier studies, and can easily refer to strategies already learned and knowledge at hand.

The strongest statements of metacognitive experience (M17 and M18) somewhat refer to the students' need for efficiency – using their skills and competencies in the best possible way. In respect to monitoring (M31) we can see that in having a goal, which we noted as scoring well (M1), the students also possess, the ability to keep monitoring the route to achieving the goal. In summary, it can be said that most students in university have their own goals and accomplishment strategies, but we have to note in entrepreneurship courses that not all students have the necessary abilities, as we also noted student explanations that do not reflect much conscious self-development.

Drawing from this, we continue by comparing the lowest scoring statements (Table 8), and explanations from the students. According to the statements on goal orientation, we stated earlier that students have a clear awareness of their goals. However, in the same component of metacognition, we face less developed aspects (M4 and M19) – the evaluation of their own accomplishment and their use of time in order to achieve the best results.

Table 8. Student opinions selected from interviews supplementing the weakest survey statements

Survey statements	Interview statements
Goal orientation	
M4. I ask myself how well I have accomplished my goals once I have finished	In the BA you just did what you had to do (R1)
	Once I was seriously not satisfied with my exam I thought of redoing it, but then, I did not (R2)
M19. I organise my time to best accomplish my goals	There are delays, but eventually, I do what I have planned (R3)
	A theoretical subject ... I read it through within 3 days before the exam (R1)
Metacognitive knowledge	
M7. I challenge my own assumptions about a task before I begin	I have been closed in mind, having a lot of fears of failing ...
	... I consider this my main weakness (R2)
M13. I ask myself questions about the task before I begin	It is easier in sports ... we calculate how fast I run then we know how far I can jump (R4)
Metacognitive choice	
M27. I ask myself if I have considered all the options after I solve a problem	It works very well what I learned to use in basic school (R4)
M29. I ask myself if I have learned as much as I could have after I finish the task	There are many obligatory courses I would not choose, just try to pass (R2)
Monitoring	
M33. I find myself analysing the usefulness of a given strategy while engaged in a given task	Under task load, there are times when I think if I suit here at all (R3)

Source: Compiled by the author based on survey results and interviews

Students admit doing what they were told to do and no more, and using weak time planning. This relates to subsequent weak aspects of metacognitive knowledge (M7, M13), where students do not challenge their own assumptions or available knowledge but count on the knowledge they already have. Students hence understand the weakness they have.

This study considers metacognitive choice the weakest component as no single statement appeared among those with stronger scores. Looking at the statements for metacognitive choice (M27, M29) and the explanations from the respondent (R4), we see that there is a choice to pass the course, to achieve the goal, but not consciously following personal development and potential. This aspect shows a lack of creativity and curiosity, competence in problem-solving, and must be carefully considered in the design of entrepreneurship courses.

In addition, the statement on monitoring (M33) turns out to be weaker with the high-achieving respondents, as in addition to test results we recognize the students' worries about accomplishing tasks without attempting to consciously control if the methods used are the

most appropriate. So the student is questioning their own self-worth instead of analysing their choices. Being more aware of the concept of metacognition prevents situations of this kind.

Based on the results of analysis it is possible to argue that students with higher metacognitive abilities have more knowledge on how to adapt their existing knowledge to the demands of any given task. Nevertheless, they underestimate the usefulness of making sure they understand their tasks clearly and choosing between different strategies to achieve the best results. The ability to question their own assumptions and subsequently be able to flexibly switch between different strategies was equally problematic both for undergraduate and graduate students. On the other hand, and on the positive side, goal setting skills in general, were strong as was metacognitive experience in all respects.

In addition, the interviews highlighted two more important aspects of the theoretical conceptualisations indicating motivation – to get a scholarship, grades need to be kept in mind (R1) and the sense of task value there are many obligatory courses I would not choose, just try to pass (R2). These are statements on the edge of metacognition, perhaps overlapping the motivational-volitional aspect. Based on metacognition, a student might reflect on his or her own considerations about why certain courses are not of interest. Could it be that he or she just lacks information about low-interest courses. Respondents admitted unanimously that if the subject or task is not valuable or interesting enough, the commitment is low and they spend the minimum time required. On the other hand, the students interviewed are more critical of subjects and tasks they pick themselves. A good example is the opinion of respondent R4, the sportsman, who strongly engaged strategies, training schedules, goal setting and achievements in sports. Respondent R3, becoming a mother and wanting to spend more time with her baby, admitted a dramatic change in her behaviour – she started to set very concrete and tight schedules to achieve more. Obviously, some personal motivators, especially external, may assist the development of metacognitive skills. However, the scholars referred to in this paper agree that metacognition can be and should be developed in and through entrepreneurship education.

4.3. Implications for entrepreneurship education

Based on the collected fragments of recommended interventions from different authors (Ch. 2.2.), supported by the empirical study here certain patterns are revealed from the weakest and strongest aspects of metacognition (Ch. 4.1.). In addition, student reflections and examples (Ch.4.2.) also, help facilitate the formation of implications for entrepreneurship education. The discussion here will now draft suggestions for the development of entrepreneurship courses (Table 7) to increase metacognitive awareness. We discuss the weakest components of metacognition based on theoretical assumptions.

First, the development of goal setting is discussed. The statements that scored low in the survey indicate that the evaluation of the achievement of goals, which according to Flavell (1979), should be a continuous process of metacognition, is not sufficiently taken into account. There is a need for assistance in establishing sub-goals and checkpoints, and most importantly in the planning phase to set the end-values and qualities the goal has to meet, as well as sub-goals as suggested by Efklides (2009). During a course, it could be a strategy for homework that is developed during the course in smaller parts controlling the previously agreed objectives. In addition, poor time management and low interest in the task or results act as obstacles to setting goals. Efklides (2009) explains that goal setting involves planning, which includes the

sequencing of procedures, establishing a time schedule and again, also check points. Dividing the course into smaller tasks with checkpoints is an option for rehearsing time management while discussing the expectations and possible outcomes of the course or project as a way to increase the student's interest in the subject.

Secondly, metacognitive knowledge is about knowing what factors or variables act and interact or affect the course or task, as expressed by Flavell (1979). But epistemological beliefs, as Efklides (2009) argues, are crucial for the critical appraisal of one another's thinking and reasoning. Letting the students express their beliefs and assumptions about a task so that the teacher could provide specific knowledge to challenge them, is a useful strategy. Looking for factors and variables influencing certain tasks would be a practical approach, a practice of procedural knowledge (Shraw 1998). Asking questions about the task before beginning, according to Flavell (1979), refers to knowledge about the self and others in terms of competencies and weaknesses. Pintrich (2002) argues that letting students know their own strengths and weaknesses means they can adjust their thinking. Flavell (1979) suggested it would be good to rehearse each time with certain questions: How capable am I for that? What knowledge do I have and what is available? What are the weakest points? One could improve one's ability and environment for learning beforehand to become more self-efficient (Schraw 1998). To question epistemological beliefs, Efklides (2009) suggests reflection as making one more aware of deciding on reliability and validity. She also suggests that a task or subject may have no value and no interest for the person, and there is therefore a lack of motivation for strategic involvement, which found confirmation in the qualitative survey.

Flavell (1979) stresses the comprehension of a task or study material through study. There are various degrees and kinds of comprehension options like discussion, case studies (Schraw 1998), problem-solving (Vos & de Graaff, 2004) as well as looking up the main points and trying to repeat them to yourself in your own words (Flavell 1979). As Vos and de Graaff (2004) suggest, teachers can creatively change between different strategies as each becomes habitual for the students making sure the comprehension of the task or study material.

According to Haynie et al. (2010), metacognitive choice appears to be expressed in the selection of what is perceived to be the most appropriate cognitive response. The low scoring statements in the survey were explained by the students interviewed as behaviour they mutually called "just getting things done". This might also refer to insufficient knowledge of the availability of strategic options (Flavell 1979, Schraw 1998). However, entrepreneurship education provides many opportunities (Haynie et al. 2010) to practice with real-life entrepreneurial cases. The latter were also seen as beneficial by the respondents as making it possible to be involved more closely in entrepreneurship.

Table 9. A sample entrepreneurship course design for increasing metacognitive abilities in students

Component of metacognition	Methodology	Details for practical activities (exercises) in the course
Goal orientation	Controlling Planning (Personal or group study plan) PBL	Set goals, sub-goals, establish checkpoints, needed values and qualities for each – check and discuss them. In larger groups use self-evaluation or student peer-evaluation. Include timeline. Involve students in planning the course, keep flexibility.
Metacognitive Knowledge	Normative study Analysis Discussions Learning Diary Psychology tests Group work	Ask students (essay) about their beliefs and assumptions about the subject. Challenge these with extra knowledge. Look for factors and variables influencing each task, for available and needed information. Use learning diary for reflection. Discuss what capabilities (test) are needed to achieve the goal, what are current weaknesses and strengths, what knowledge has to be acquired. Enhance procedural knowledge with group tasks
Metacognitive choice	POL Process-oriented instruction Social interaction Creativity exercises	Make sure of comprehension serving different options achieving this like giving information translated into own words (learning diary) or discussing/solving the cases. Group business models. Give knowledge of different strategies and creatively exchange between them with each task as it becomes habitual to ask which strategy is best to use each time and what are the options.
Monitoring	Feedback Analysis Learning Diary	Ask for motives, available (metacognitive) resources, task demands, new needs, time spending, required qualities etc. You may want to use a checklist or learning diary.
Metacognitive experience	Discussion Case studies Metacognitive reflection Learning Diary	Do not forget to ask how students feel about the tasks or problems to be solved, if they are too difficult, too demanding, or too easy. Take into account and make adjustment to optimize. Support discussions where experience and feelings can be shared. Use learning diary to reflect feelings about topics.

Source: Compiled by the author based on survey results and interviews

This is closely related to monitoring, representing the process of seeking and using feedback to re-evaluate and adapt motives, metacognitive resources, recognition of task demands, and the identification of new needs as put by Haynie et al. (2010). They suggest reflecting on how, why and when to use certain strategies, as Efklides (2008) recommends analysing the demands of the task and identifying new needs in the monitoring process.

Further, a common statement that emerged from the interviews was that students look more carefully at what they gain from course or task when they select it themselves, and subjects of low value and interest are not followed in the same manner. Efklides (2009) emphasizes the role of metacognitive experience that activates metacognitive skills, monitoring actions and behaviour, and stressing the importance of feelings. Therefore, the affective nature of metacognitive experience, creativity and sensitivity to the environment or atmosphere, has to be considered as part of learning.

One example is completing self-evaluation tests so as to increase the value of the tasks for the student and letting them choose between different tasks or subjects for homework tasks or group discussions. As Vos and de Graaff (2004) suggest, involve and make the student active.

In general, the greater use of illustration and visualisation, as well as discussion in the

classroom has been suggested in order to focus attention on the students' interest in a subject or task. This can be done by visualising the value or outcome for the student. The second recommendation is to use creativity exercises. To that end, it is beneficial to think about creating an appropriate environment, where open discussion and sharing experiences are possible or creativity could be fostered.

The research confirms that in order to develop metacognitive abilities in students, a single tool or method is not sufficient. As the lowest aspects of meta-competencies are connected to understanding one's own thinking patterns and weighing between different choices, we find reflection to be a very important method to enhance these aspects of metacognition. And though there are critical stands on the use of business plans, with proper design it enables several metacognitive exercises like setting goals and sub-goals, time planning, knowledge evaluation and synthesizing different areas of knowledge, strategic decision-making and reasoning, and monitoring the entire process. Course design should include a variety of carefully designed individual and collective activities for comprehensive development.

5. Conclusion

Starting from the problem described in the introduction (Urban, 2012), this paper set out to fill the gap and present how metacognition is manifested in the framework of entrepreneurship education and how the different components of metacognition are developed in students. In the theoretical background, it was acknowledged that metacognition is an independent phenomenon, with most attention from educational psychology. But little research has been made to analyse the development of metacognitive abilities in students in the entrepreneurship field.

This paper initially aims to generate an understanding of the individual differences between students in terms of metacognitive abilities using a survey instrument modified for use in the entrepreneurship context (Haynie, 2005; Ling et al., 2013). The results present significant variation in the components of metacognitive knowledge and metacognitive experience among different students as well as between male and female students. Since earlier claims made by Memnum and Akkaya (2009) contradict these findings, there is still a need to investigate this aspect further in order to find a consensus.

Since Flavell (1979), we have quite a clear understanding that students can be differentiated on the basis of metacognitive abilities; this study adds that students who have higher scores in one component of metacognition, also have greater means in other components and vice versa. In the framework of entrepreneurship education, it can be concluded that students have different needs for development. Moreover, to understand educational needs, specific aspects, generally scored highest and lowest were compared and analysed. Such a comparison has not been conducted before, to the author's knowledge. This analysis therefore, revealed rather interesting results, contributing to our understanding of connections between metacognition and educational settings. The strongest statements indicated that students generally set goals for themselves but then do not orient themselves towards the best outcome or use of time. Students understand the connection between knowledge and performance but again do not think about what they currently know and what else should be known. Metacognitive abilities are expressed in terms of achievement orientation, being aware of comprehension levels set by teachers and following fixed homework timetables, using in most cases a getting things done strategy, as one student in an interview explained. Looking at the weakest statements, it

becomes clear that students underestimate the usefulness of making sure they understand their tasks clearly or choosing between different strategies to achieve the best results. The ability to question their own assumptions and subsequently to be able to flexibly switch between different strategies is equally problematic both for undergraduate and graduate students. This reflects how metacognition hardly develops in the framework of traditional, teacher-centred environments. Students do not challenge their own potential or serve their future needs, but rather obey the demands of the course. Therefore, an interesting pattern emerges that is important to consider when planning an intervention.

Consequently, the emphasis should especially be placed on student awareness and the management of their own potential. Hence, this paper provides a practical holistic proposal for how metacognitive abilities can be developed systematically through entrepreneurship courses. A systematic course design addresses each of the sub-constructs of metacognition choosing tools, and examples available in this paper, and giving attention to the most underdeveloped metacognitive abilities. The multidimensionality of metacognition indicates that a single tool or method is not sufficient. Among other methods, reflection is crucially important to enhance aspects of metacognition and is strongly recommended in entrepreneurship education to encourage metacognitive awareness. Moreover, this study supports the use of the methodology of business planning since it enables several metacognitive exercises like goal and timeframe setting, reflecting upon and synthesizing knowledge, strategic decision-making, and monitoring. To summarize, course design should include a carefully designed variety of tasks for individual and collaborative activities, embedded within the content matter to ensure connectivity.

Limitations in the current research include the fact that this was a study carried out in one university, so the weakest and strongest aspects of metacognition may differ in other environments and contexts. We also limited this study by not going any deeper to show the connection between metacognition and motivation, as well as emotional aspects. Therefore, this further research avenue would reveal the interplay between metacognition, emotional (affective) variables and motivational-volitional (conative) aspects also brought to the meta-level. There is a need for future research in compiling a similar set of intervention methods, involving the management of emotional and motivational aspects with metacognition. A lack of practical studies exists in entrepreneurship education showing the design and assessment processes when metacognitive strategies are used. Since the phenomenon of metacognition is rather complex for teaching, and the educational aims of entrepreneurship courses vary, further instructional studies similar to the current one might be of value to practitioners in course development. This paper tried to connect the widespread research on metacognition with its practical output.

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Article III

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Exploring the Gaps of Metacompetencies Between Entrepreneurs and Students

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The concept of metacompetencies has not much attracted entrepreneurship research though indicated having a fundamental role in successful entrepreneurial activity. The few studies have so far based on student samples only, so there is no empirical data demonstrating how this theoretical construct is practically used in entrepreneurship. Moreover, the question being in the focus of this paper, is how metacompetencies differ when comparing groups of entrepreneurs and students. This study aims to look into these gaps.

Assessing metacompetencies empirically by employing the phenomenological mode of enquiry we can explore the phenomena of metacompetencies in an entrepreneurial setting by studying thirty in-depth interviews with active entrepreneurs. It appears that metacompetencies are in frequent practical use and, more specifically this paper establishes how metacognition, meta-affection, and metaconation interact within the environment of entrepreneurship. Confronted with similar results from student reflections, the comparison reveals important discrepancies in terms of procedural knowledge and an awareness of motivation and temperament for educators to address in order to foster entrepreneurial behaviour.

Keywords: Metacompetencies; metacognition; metaconation; meta-affection; entrepreneurship education.

INTRODUCTION

Entrepreneurship, striving to opportunity harnessing, has a consent to be the key of the global economy, forcing into new entrepreneurial events. Understanding that many or most entrepreneurial opportunities are more enacted than they are discovered (Gartner *et al.*, 2003) this scholarly field is

fundamentally concerned with understanding the nexus of opportunity and enterprising individuals (Venkataraman, 1997).

Moreover, entrepreneurs' are recognized creatively manipulating with their skills and competences in many different contexts (Foss and Klein, 2012; Gibb, 2011) using their contextual knowledge to identify patterns that are not visible to others (Baron, 2006). This offers challenges to universities in understanding how these skills and competencies evolve. Claiming that students are antecedents to start-ups, Phan *et al.* (2002) stress the importance of experience, beliefs and attitudes towards entrepreneurship to predict the propensity of entrepreneurial activity. Moreover, scholars have addressed the importance of developing student coping competencies — a combination of knowledge, skills, and abilities (Hoffmann, 1999; Tubbs and Schultz, 2006) as studies present strong relationships between academic performance, and certain behaviours and habits of mind (Dries and Pepermans, 2007).

Scholars, following competence models (Boak and Coolican, 2001), have reached and confirmed the importance of metacompetencies, though in a variety of conceptualisations. It goes back to distinguishing between competence, as being competent meeting the job demand, and competency, as possessing the necessary attributes for competent performance (Burgoyne, 1988). Thus, competency captures skills and dispositions beyond cognitive ability such as self-awareness, self-regulation and social skills (Bryant, 2006) while some of these may also be found in personality taxonomies, competencies are fundamentally behavioural and, unlike personality and intelligence, may be learned through training and development (McClelland, 1998). Cheetham and Chivers (1998) in parallel add that development of competencies takes place within the interaction of metacompetencies.

Metacompetencies as a concept, is not entirely new, entering the discussion in the early 1990s by Human Resource scholars. In management studies it was highly concentrated upon describing the qualities which most effective managers should possess. Also presented as an over-arching input that facilitates the acquisition of output competences (Le-Deist and Winterton, 2005), concerned with the ability to cope with uncertainty, as well as with learning and reflection. Therefore, metacompetencies are supposed to be a fundamental asset when it comes to enabling successful entrepreneurial activity. Supportive literature which covers entrepreneurship education increasingly recognises the importance of intangible abilities such as motivation and emotions in the process. Along with this, the paper follows

the framework of metacompetencies, including metacognition, meta-affection, and metaconation, based on the seminal work of Kyrö *et al.* (2008). This initial tentative investigation of meta-processes has developed so that it is theoretically established within the setting of entrepreneurship education and can be assessed (Ustav and Venesaar, 2013; 2018; Ling *et al.*, 2018). However, the studies referred to have so far only been conducted with students, so there is no actual study available to show how this theoretical construct may manifest itself within the practice of entrepreneurship. Moreover, there is lack of evidence about differences in metacompetencies which separate active entrepreneurs from other groups, in this case, students. Le-Deist and Winterton (2005) see the potential of metacompetencies to be developed into comprehensive typology when further explored.

With the general objective of increasing entrepreneurial or enterprising resources, serving entrepreneurship education with new empirical data from the field, current research aims to complement the conceptual framework of metacompetencies with a new, practice-orientated perspective. Specifically, from the field of entrepreneurship, we aim to investigate how and in which situations are metacognition, meta-affection, and metaconation expressed by practitioners-entrepreneurs, and whether these findings are different from the results of the student sample. Specifically, this research seeks to address the following questions:

(1) Which situations in entrepreneurship reflect entrepreneurs' use of metacompetencies, including metacognition meta-affection, and metaconation;
(2) What are the differences in metacompetencies as expressed by entrepreneurs in comparison to students.

In answering these questions, this study shall be exploratory and interpretative in nature using the qualitative research design of phenomenology. The research data in this paper is drawn from thirty in-depth interviews with randomly-selected active entrepreneurs from different European small enterprises, and a variety of industries. The results are analysed and discussed in order to demonstrate the difference between students' and practitioners' metacompetency areas to provide objective information to entrepreneurship educators.

In order to achieve this, the theoretical background of metacompetencies will be introduced, and methodological choices will be explained. The research results demonstrate important gaps between the reflections of

entrepreneurs in comparison with students. The results are discussed, addressed to entrepreneurship scholars and educators as a priority.

THEORETICAL BACKGROUND — METACOMPETENCIES

The globalisation with rapid change of environment is calling for more flexible kind of abilities, and encouraging the search for context-independent competencies that are effective in their use across different institutions and jobs under varying conditions. The idea that competencies which are acquired in school or vocational setting aiming specific context, discipline or industry, is for long not enough to succeed. Individuals are expected to become enterprising, taking the responsibility of own learning and success, having abilities to judge and use own competencies, to guide own actions. The ability to judge the availability, use, compensation and learnability of personal competencies has been called a metacompetence by Nelson and Narens (1990). Briscoe and Hall (1999) speak about metacompetencies — competencies so powerful that they affect the individual's ability to develop the competencies they will need in the future. To sum up, metacompetencies are these overarching competencies that facilitate self-awareness, self-management and adaptation.

In detail: competence models in entrepreneurship studies are seeking for more subjective and interpersonal capacities such as communication, self-awareness, self-reflection, and self-assessment (Le-Deist and Winterton, 2005; Weinert, 2001; Zimmerman, 1995). There are a number of theoretical frameworks being employed in the study of self-regulation (Bryant, 2009). One important aspect very determinedly studied under self-regulation is metacognition, and scholars (Mitchell *et al.*, 2005; Haynie, 2005) argue that the foundations of an entrepreneurial mindset are metacognitive by nature. Haynie in his research (2005) makes a claim which demonstrates the influence of metacognition to the level of adaption on individuals when managing their developing and changing circumstances. However, there are a good many scholars who claim that metacognition is not enough for self-regulation (Efklides, 2008; Kyrö *et al.*, 2006; Ruohotie and Koiranen, 2000; Zimmerman, 1995), as emotions and conative constructs such as motivation and volition are proven to be an important and inseparable part of actual behaviour and of working together as influencers of intentions. This is how the tripartite model (Ruohotie and Koiranen, 2000) entered into entrepreneurship studies, taking the conceptual form of metacompetencies (Kyrö *et al.*, 2006).

The term is used in other competence-related studies from other fields, especially in human resource development in management education studies (Cheetham and Chivers, 1998), proposing the ability to reflect upon one's practice and one's competence, to analyse and modify practice, and to further develop a competence as a super-meta-competence. Even so, despite its support, fundamental questions remained with the concept of meta-competences (Cheetham and Chivers, 1998) in spite or because of the wide variety of conceptualisations (Table 1). Starting with meta-qualities (Reynolds and Snell, 1988), and further facilitating deep learning amongst managers, Pedler *et al.* (1994) developed a competency classification system which reflected the successful manager. Their concept proposed several competencies and qualities which an effective manager should possess: basic knowledge and information, skills and attributes, and metacompetencies. Metacompetencies in these works include creativity, mental agility, balanced learning, and self-knowledge while, for example, emotional resilience is a skill component as motivational and volitional aspects may belong to judgement-making or skills and attributes. The model was further developed for management education by Buckley *et al.* (2002), drawing in a total of fifteen qualities as metacompetencies.

In parallel, Linstead (1990) proposed meta-qualities, especially in relation to sensitivity to events, problem-solving, and decision-making, social skills, and emotional resilience. He suggested that these qualities can only be fully developed in a group situation, bringing together simulation and learning by discovery as being very effective in facilitating the development of those intangible meta-qualities, and laying beyond the basic skills (Linstead, 1990). In opposition, Reva B Brown (1993) proposed that knowledge has a short shelf-life, and importance should instead be placed on the skills of statement, assertion, argument, proof, application, and communication, involving teams, case studies, a work study, and plenty of practice. These skills are collected together in the paper (Brown, 1993) in the form of metacompetencies, appointed as higher-order abilities that serve one's capacity to learn, adapt, anticipate, and create. Metacompetencies, according to Brown, represent the range of perceptions that exist about an individual manager's performance, as well as focusing on the irrationality and unpredictability of personal feelings.

The idea of metacompetencies has been exploited in numerous publications in different fields, and has taken directions and adopted formulations of its own as shown. Mainstream research on metacompetencies was found in the management and human resources domains which are clearly distinctive from education-related studies.

Table 1. Theoretical Developments in Metacompetencies.

Educational Research	Management Research
Fleming (1991) Another dimension over competencies Adaptability Additional manipulation	Reynolds and Snell (1988), meta-qualities Creativity Mental agility Balanced learning skills
Linstead (1991) Sensitivity to events Problem-solving Social skills Emotional resilience	Pedler *et al.* (1994) Creativity Mental agility Balanced learning skills
Haste (2001) Adaptively assimilate technologies Deal with ambiguity and diversity Manage motivation and emotion Enact moral responsibility	Buckley *et al.* (2002), fifteen qualities, inc: Relevant professional knowledge Problem-solving and decision-making; social skills and abilities Proactivity and creativity
Kyrö *et al.* (2008) Metacognition Metaconation Meta-affection	Tubbs *et al.* (2006), seven areas Big picture understanding Attitudes and leadership Communication Innovation and creativity Mental agility Balanced learning Self-knowledge
Bogo *et al.* (2013) Learning and growth as a professional Intentional use of self	Le-Deist and Winterton (2005) Cognitive competence Functional competence Social competence
Ustav and Venesaar (2013) Metacognition Metaconation Meta-affection	Norton (2010) Flexible leadership

Source: Author's compilation.

Medical education brings us a step closer to our concept, with the aim of better understanding the concept of meta-competencies through reflections in social work. Bogo *et al.* (2013) base their study on Kane's (1992) competence model as a set of knowledge, skills, and attitudes or values that

are evident in the behaviour of particular professions as they perform roles within their scope of practice (Bogo *et al.*, 2013). This is an approach which produces the competence that is attached to the role and situation one which our understanding of metacompetencies rules out. Similarly, the aforementioned references describe metacompetencies by referring to the higher order, overarching qualities, and abilities which are of a conceptual, interpersonal, and personal/professional nature, including student cognitive, critical, and self-reflective capacities, bringing critical and creative thinking to bear in assessments and decision-making, which should theoretically be reflected in skilful interactions with clients (Bogo *et al.*, 2013). The study by Bogo *et al.* (2013) in looking for an holistic, distinct continuum of metacompetence, applies to our study in many respects, although the three dimensions they highlight do in fact differ: the conceptualisation of practice, the intentional use of self, and learning and growth as a professional. The first and third of these are metacognitive abilities, while the intentional use of self is in the nature of metacompetencies, the consciousness which makes it *meta*. Looking closer for their examples (such as with pain experienced and a decision to be more empathetic and supportive to one's mother; 'I have no experience with this — I was never taught about it — I don't know what to do'), we can recognise metacognitive, meta-affective, and metaconative aspects which fit well into the tripartite framework of metacompetencies that we support. Moreover, it has been well stated that mindfulness (Bogo *et al.*, 2013) is very important for practitioners and is increasingly used when coping with various situations. Inconsistency continues with the publication from Nielsen (2014), whose interpretation of metacompetencies overlooks much of the discussion about the essential difference in competency-skill, and the aspects which stand for *meta*. Knowledge of foreign languages and cultures or creativity are hardly to be considered aspects of metacompetencies. Hence, together, these studies outline the fact that there is a need for more rigorous discussion in this area.

The framework in the current study relies upon the decades-long development of a tripartite model of behaviour (Figure 1), involving: cognition, affection, and conation (Rosenberg and Hovland, 1960; Snow *et al.*, 1996), which was introduced in entrepreneurship research by Ruohotie and Koiranen (2000).

To understand the tripartite construct more deeply, we have to return to the roots of each sub-construct. Metacognition has two main sub-constructs which have been agreed by scholars. These have initially been divided into knowledge and experience (Flavell, 1979; Hacker, 1998; Haynie, 2005), in parallel being defined as being declarative and procedural knowledge

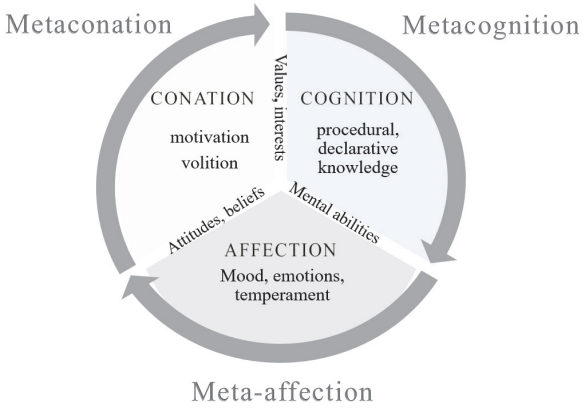

Figure 1. Theoretical Model of Metacompetencies, Drawn by the Author. Based on: Kyrö *et al.* (2011).

(Schraw and Dennison, 1994; Snow *et al.*, 1996; Ruohotie and Koiranen, 2000). Kurczewska *et al.* (2017) claim that procedural and declarative knowledge have very different profiles. According to these authors, metacognitive declarative knowledge refers to an awareness of one's own knowledge, beliefs, competencies, and limitations — what I think and know. Procedural knowledge or experience asks how — asking oneself questions about the requirements of the task, about comprehension, contradictions, strategic choices, etc. Furthermore, when the profile for declarative knowledge is individual, procedural knowledge is more about interacting with emotions, motivation, and volition (Kurczewska *et al.*, 2017). The authors also suggest that the core of current pedagogic practices focuses on declarative knowledge.

Metaconation involves consciously targeted behavioural intentions and predispositions to behave in a certain way towards a certain object (Robinson *et al.*, 1991). Conation involves two distinct sub-components: motivation and volition (Snow *et al.*, 1996). These are well specified by Ruohotie and Koiranen (2000), where pre-decisional needs and processes which underlie the formation of goals, decisions, and intentions to act serve to imply motivational aspects, whereas the processes of enactment, the perseverance and protection of the intention-action and similar, belong to the volitional component. A lack of one or each of these may distort the planned behaviour.

Meta-affection is conscious awareness, monitoring, regulation, and the evaluation of intra-personal and interpersonal affective activity (Watts, 1998). It consists of two main avenues, one of emotions and other affective

states such as situation-triggered feelings and moods, and the other is made up of a more dispositional and persistent temperament. Efklides (2009) stresses the importance of perceived task value, being similar or based upon an interest which creates a student's feelings about the topic or task. Efklides also stresses that a recognition of both negative and positive affects is important for development.

Researchers have moved on from the discovery of cognitive power, realising that cognition is affected by feelings, motivation, and intrapersonal and interpersonal characteristics. Entrepreneurial decisions and actions often following entrepreneurs' emotions or temper (Cardon *et al.*, 2012). Enhancing enterprising behaviour cannot be an effective process without this recognition. A longitudinal study from Kurzcievska *et al.* (2017), makes a claim that all three constructs — cognition, conation, and affection — are present during the learning process and are prone to change.

To sum up, it is necessary here to clarify exactly what is meant by *meta*. In the available literature, the term tends to be used to indicate a higher order acumen which recognises one's own thoughts and abilities, tasks, situations, and environments (Flavell, 1979). Performance can be achieved through order, whether subconsciously or automatically. *Meta* has been applied to situations in which an understanding is available of the needs and conscious strategic choices of performance, or simply in a level of awareness of it (Fernandez-Duque *et al.*, 2000), in an ability to reflect upon, understand, and control any process (Schraw and Dennison, 1994).

We have thoroughly studied the concept of metacompetencies in previous work which provided an assessment of international students (Ustav and Venesaar, 2013; Ustav and Venesaar, 2018). Therefore, in order to bring it adequately into the classroom, there is a clear gap for this study in understanding how metacompetencies are reflected in entrepreneurship practice, as expressed by entrepreneurs, and in whether there is a difference in reflections of metacompetencies when carrying out comparisons against students.

METHODOLOGY

The research design is exploratory, following a qualitative phenomenological approach (Giorgi, 1985, 1986, 1988). For this particular study, thirty in-depth interviews were carried out amongst randomly-selected, active entrepreneurs from various small European enterprises. From the raw data,

all expressions which served to reflect meta-competence were highlighted and categorised (Appendix A), based on a theoretical understanding of metacognition, meta-affection, and metaconation. Redundant information was eliminated and mind-maps were created.

Phenomenology was used as a familiar methodological principle according to Husserl's (1962) scientific knowledge, which begins with a fresh and unbiased description of its subject matter. It reflects upon the distinctive characteristics of human behaviour and first-person experience, enabling detailed and systemised descriptions of certain phenomena. The object of phenomenological research is human experience (Giorgi, 1988), making it possible to explore perceptions of individuals which include many horizons.

In the current study we follow Giorgi's (1985) recommended four steps in phenomenological research: firstly reading the entire description in order to grasp the sense of the whole, and secondly re-reading perceived demarcating units in the text with a psychologically sensitive interest in the phenomenon under investigation. Then comes reflecting upon each and every unit of meaning in order to discern what it reveals about the phenomenon under investigation or gaining research-relevant insight, followed by the final step, synthesising these reflections and insights into a consistent statement to compile the structure of experience which is based on a theoretical framework.

Reading the full body of material has already revealed possible outcomes and has allowed the research questions to be specified. Along with this, expressions showing metacompetencies, or units of the meaning, were highlighted by both authors separately and then the confusing items were either accepted or excluded. The second step for the study was in the thematic analysis (Boyatzis, 1998) of the transcripts, which was conducted following the theoretical model of metacompetencies in order to systemise the data so that relevant patterns would become visible.

Sample

The sample initially consisted of thirty entrepreneurs. Three interviews were considered as being of very low quality and mostly described the business process, focusing on the company's activities, and therefore these were excluded. This may happen due to the entrepreneur's passion or special focus on business management issues, and the interviewers' lack of competence. However, a total of 27 interviews were carried out according to the provided instructions.

The sample consisted mainly of randomly-picked small entrepreneurs of different fields and countries, people who were available for interview. The only requirement was that the interviewee had more than three years of experience in entrepreneurship. International students volunteered finding entrepreneurs in their home-countries for structured interview. All the identities of the owners and the company names from the interviews are available, but as per ethical standards and not giving extra value to the research, only more general information has been reported (Appendix A). A description of the sample is given to show its diversity in terms of age, nationality, length of experience, and field. The age of each of the entrepreneurs in the sample varies from 26 to 67 years, and we had seven female and twenty male entrepreneurs. Their experience, if looking at the years since they began owning or partly owning a company, is between three years (2011) and 21 years (1992). We had fifteen Estonian entrepreneurs, seven Finnish entrepreneurs, three Russian, one Georgian, one from Greece, and one from Macedonia. The interviews were held mostly face-to-face, with four through Skype, all of which were recorded and transcribed.

Secondly, this research uses a sample of students, having been studied for the same phenomenon, metacompetencies under similar process of phenomenological study. The sample consisted of 99 international students from variety of nationalities, undergraduate (26) and graduate (73), studying International Relations (25) and Information technologies (74), both male (59) and female (40). It is important to note that it was the first course and direct experience with entrepreneurship for most of the students (71%). Only two students were entrepreneurs and ten students had taken an entrepreneurship course or relative as an entrepreneur or some other connection with entrepreneurship. As for the majority, entrepreneurship was a topic of no interest, just a compulsory subject to pass.

Hence, this research confronts two very diverse samples.

RESULTS

The first reading of the interviews indicated that most of the entrepreneurs who were interviewed demonstrated great self-awareness, i.e. metacompetencies, reflecting upon their own thinking processes, being clear about their own motivators and showing, albeit to a lesser extent, an awareness of emotional reactions, and coping strategies.

The most common structure for indicators of metacompetencies was the link from metacognition to metaconation (Table 2). These expressions

Table 2. Metacompetencies Reflected in One Sentence with a Direction from Metacognition Resulting the Metaconative Expression.

N	Metacognition	Metaconation
1	I wanted to continue the family business, needed money, and wanted to study and develop myself	so I wanted to start
1	My main strategy is once I start I have to finish	Don't like things pending; do it until the task is finished
4	I have degree in economics but did not want to take big risks	So we avoided taking out any loans or hiring people at the beginning, doing all we could ourselves
4	It was a tough choice, one which I would not recommend to our children	We have to work, or at least think of our business 24/7
4	We want to keep it realistic and not to overestimate ourselves, not get risky	Any free money we have gets invested into property to maintain our future security
4	We're trying to ensure our retirement	to live free and in peace
4	In the long term perspective we saw it as an opportunity	so we had the motivation but moved along with baby steps
4	We knew we had the will and we needed the money	so we created our own jobs
4	Responsibility, responsibility, responsibility... if it's something you don't have, don't even start	You have to do what you have promised to do
10	Starting as an entrepreneur was entirely coincidental, but I gained invaluable experience	Doing everything myself
10	I immediately decided to put the focus on quality instead of quantity	And I have achieved great results by creating the best quality service
10	Profit is not being put at the forefront. Yet!	I am doing it to set up the business itself, bringing it to perfection
10	Probably through drawing, which once seriously fascinated me, I 'see' the picture for along time before taking up paper and brush.	So here I see the ultimate goal and I move gradually towards it
11	I'm constantly looking for new business ideas and even right now freedom andopportunities, only the sky is the limit	I have something new that I'm already working on

Table 2. (*Continued*)

N	Metacognition	Metaconation
22	Because it's the business which gives me the opportunity to fully realise my potential	At that moment in which I felt the power to go into business, I almost immediately took it having since been thoroughly working out the business plan, and calculating the risks
27	I had strong wish to find the solution and make it simple and automatic	The success pushed me to carry on
27	Chemistry did the trick, as it offered me huge support in motivation and method of thinking	I was eager for experience and started looking for tasks
27	I am optimistic and have a plan for growth	Every change takes time. I am trying to monitor current opportunities
27	I have a certain plan for the year	I am trying to use best practice and my experience

followed each other within one sentence or in successive sentences, showing that one caused another: that is, thinking in a particular way results in a particular action: 'I wanted to continue the family business, I needed money, I also wanted to study and develop myself, so I wanted to start'. This expression is a good example of how metacompetencies work together. In awareness of wanting something, we talk about volition or metaconation, as being aware of one's own needs and desires and setting one's own life plans, we consider metacognitive. When looking these metacognitive and metaconative expressions together, it becomes obvious that they are tightly connected to one other.

However, we can witness other directions (Table 3) for metacompetencies. When a metaconative expression emerges after a metacognitive or meta-affective: 'It feels horrible when there is no money, but I am not the type who gives up'. This is a very typical expression we encountered in a number of variations, one in which negative feelings are connected most often to financial difficulties, and these also occurred together with feelings of responsibility. In this example the metaconation — an awareness of not giving up — motivates further behaviour.

Even more impressive were those interviews in which we could observe the use of all meta-competencies which were connected to one other (Table 4). Interviews where entrepreneurs expressed combinations of all three constructs of metacompetencies were more rare.

Table 3. Examples of Metacompetencies Reflected in One Sentence with Different Directions.

N	Metaconation	Metacognition
4	We moved on as finishing was out of the question; there was no chance of giving up	The losses would have been even greater if we had stopped
10	When I started to build this car wash	I already knew what I want to do, and how
27	Now I spend three times more time on it because we are trying to expand	And it's up to me to select the direction
	Meta-affection	Metaconation
4	It feels horrible when there's no money	But I am not the type to give up
4	It feels great when people are satisfied	There is no sense in doing what no one wants
10	I was always afraid of financial losses, and then for some reason, the fear was gone	I went and took a chance
	Metaconation	Meta-affection
1	We were struggling with finance	It caused frustration and anxiety
4	Money has its part in being a motivator	It's a good feeling to be able to provide your family with all they need and not to have to worry about the future
11	You have to try to do	and not be afraid of failing
	Metacognition	Meta-affection
1	I did not have any experience	And I felt I was so *green*
7	Money is not the only motivator, that's most definite, but the development of the business,	creating new jobs, provides a very good feeling

As in cases involving dual expressions, tripartite expressions also occurred in all possible combinations, while the sequence of metacognition — meta-affection — metaconation was the most frequent.

For example, if we look more closely the first example: 'It was very difficult with finance. I thought I should go for a paid job and it caused me frustration and anxiety, but I had my pride, I could not give up'. This expression shows how the entrepreneur was aware of the critical evaluation of the situation, thinking of different options, involving declarative and procedural thinking, which involved emotions like frustration and anxiety.

Table 4. Metacompetencies Occurring in One Sentence with Direction from Metacognition, Resulting in Meta-Affective and then Metaconative Expressions.

N	Metacognition	Meta-Affection	Metaconation
1	It was very difficult with finance, so I thought I should go for a paid job	It caused frustration and anxiety	But I had my pride; I could not give up
1	I like to set my goals and achieve them, and like to be able to do good for people	It makes me feel satisfied, a feeling of achieving something	Positive feedback is a very big motivator for an entrepreneur
22	Tourism is something that I know and like. I knew that I needed to come up with something that would appeal	To my free, creative, and joyful attitude towards work	Putting your entire body and soul into the job, working 24 hours a day — the results start to appear pretty quickly
27	First of all I found myself. I found things I like. I found things I am good at	And received gratitude from colleagues	These factors made me believe in my business and in success

But also an awareness of their own conative strength where pride reflects the motivator, causing the actual behaviour.

Markers of entrepreneurial metacompetencies

Furthermore, we have conducted a full content analysis in order to identify the concrete events or situational or task-related points to which metacompetency-related expressions were connected (Table 5). As early as during the process of reading the material, we were able to notice certain patterns or similarities in situations, tasks, or thoughts, as described together with reflected metacompetencies.

Metacognition was most commonly connected to thoughts of self-realisation and recognising one's own needs and desires, and building personal plans upon them. In the entrepreneurship process, most entrepreneurs claimed if not on paper then in their heads that they always make plans, set personal and organisational goals, and consider different strategic options. They know their own limits in terms of knowledge and experience, and in terms of thinking about what makes them strong and where there may be weaker areas which are in need of development.

Table 5. Situational Markers for Metacompetencies.

Metacognition Areas	Meta-Affection Areas	Metaconation Areas
Self-realisation	The feeling of being 'ready'	Competition
Problems are solvable	Ego/pride recognition	Following the plan
Doing thing I know and like	A feeling of satisfaction	Taking a conscious action
Know what is needed	A feeling of achieving something	Recognising self-motivators
Goal-setting and monitoring	Maintaining optimism	A need for 'finished' situations
Strategic considerations	Tired of searching/bad job	The need for money (job)
Understanding priorities	Feeling difficulty	Working hard (24/7)
Learning needs	Feeling inexperienced	Orientated to see results
Reflecting experience	Frustration (lack of finance)	A not giving up attitude
Conscious idea/product development	Anxiety (with responsibility)	Following one's desire
Realising one's own limitations	Happy with the right decision	A need to accomplish the task
Following a plan (dream) for life	Afraid to fail	Taking use of best practice
Awareness of risk-tolerance	Inspired by customer feedback	Making progress
Understanding one's own values	Self-created good atmosphere	Client interest

Meta-affective expressions more often followed thoughts and acknowledgements of what makes them feel proud and recognised. Even very experienced entrepreneurs admitted being afraid or even scared when thinking of failing and of the risks involved.

In most of the emotional states the coping strategy had a metaconative nature: keep going, working, finding solutions to decisions; all problems are solvable, failing is not an option, we never take money from outside. All these are based on personal value systems and attitudes or on prior experience where prior mentioned are involved.

To conclude, the results of the study of entrepreneurs' reflections showed a tight connection between different metacompetencies. Entrepreneurs reflected a remarkable awareness of one's own motivational and emotional reactions when facing challenging situations in the entrepreneurship process. Something else that also occurred was that metacompetencies were found not to differ on the basis of nationality, gender, or age. During the interviews all of the entrepreneurs expressed an awareness of their own limits in terms

of knowledge, motivation, and emotions and described consciously overcoming emotional and motivational setbacks as being critical when not giving up. We can also see common characteristics in the events in expressions of metacompetencies. In order to use this information for benefit of entrepreneurship education, these results are further confronted with similar outcomes of research which was carried out with students.

COMPARING ENTREPRENEURS AND THE STUDENTS OF ENTREPRENEURSHIP TRAINING

In our previous work (Ustav and Venesaar, 2013, 2018), metacompetencies as reflected by students were thoroughly studied. Hence, we can hereby make a direct comparison of the results of both studies (Table 6) in order to

Table 6. Comparing the Metacognitive Aspects of Entrepreneurs and Students.

Declarative		**Procedural**	
Entrepreneurs	**Students**	**Entrepreneurs**	**Students**
Aiming at self-realisation	Expectations set for the course	Setting and monitoring goals	The goal is to pass all courses
Belief that problems are solvable		Knowing what I like to do and going for it	
An awareness of one's needs	Having thoughts about entrepreneurship	Conscious idea development	
Knowing one's own limitations	One's own entrepreneurial abilities and qualities	An awareness of task needs	
An awareness of one's own values	Correcting opinions about entrepreneurship	Reflecting upon experience	Comparing new knowledge to prior knowledge and experience
An awareness of risk tolerance		Following one's life plan (dream)	
Learning needs	Questioning the suitability of Entrepr. course in syllabus	Strategic choices	
		Constant prioritising	

see whether there is any relevant distinction between the components of metacompetencies when it comes to practicing entrepreneurs and students.

From that comparison it can be observed that entrepreneurs have equal self-awareness of declarative and procedural cognitive aspects, while students exhibited an overwhelmingly declarative aspect. Students seem to be more fluent in knowledge, expectations, and opinions, but not quite so much in terms of reasoning, relating to 'how and why' considerations.

A surprisingly similar pattern occurs in the comparison of metaconative, motivational, and volitional factors (Table 7). Entrepreneurs provide rich reflection for both categories, while student expressions are of a more

Table 7. Comparing the Metaconative Aspects of Entrepreneurs and Students.

Motivational		**Volitional**	
Entrepreneurs	**Students**	**Entrepreneurs**	**Students**
An awareness of self-motivators	Expressions of external and internal motivation	A need for 'completed' tasks	An awareness of time management habits
Following one's own plan		Accomplishment orientation	Monitoring one's own achievements
A need for money	A need for good grades	Observing one's progress	Comparing goals to one's own actual behaviour
Result orientation		Making use of best practice	
Following one's desire		A 'not giving up' attitude	Ready excuses to give up
Customer interest		A conscious effort leading to results	An awareness of one's own will and perseverance
		A hard-working nature	

volitional nature. A reflection on the awareness of one's own motivation is scarce.

There are also difference within a component. When looking at a 'not giving up' attitude reflecting perseverance, entrepreneurs mentioned that this kind of behaviour is out of the question. Even at the hardest of times they rather focus on looking for the ways how to come out of it. Students, however, were aware of ready-made excuses, such as blaming circumstance, unfavourable rules, or their lecturer when difficulties

occurred. Both reflect the same attitude, one (entrepreneurs) proactive, and other (students) reactive.

Furthermore, we also studied meta-affective expressions (Table 8). A meta-affective construct can roughly be divided into two subcategories: a more persistent temperament component, and temporary, situation-related emotions or moods.

Table 8. Comparing the Meta-Affective Aspects of Entrepreneurs and Students.

Temperament		**Mood**	
Entrepreneurs	**Students**	**Entrepreneurs**	**Students**
A feeling of needing to be ready for. . .		A feeling of satisfaction	A feeling of satisfaction after every term has been completed
Ego/pride recognition		Tired of searching (for a job, a life path)	Predicting one's own moods in learning situations
Good progress in terms of achievement	When a maximum grade is achieved	Experiencing difficulty	Experiencing difficulty for much of the course study period
Anxiety generated by responsibility	Social anxiety (standing up to deliver a presentation or to discuss a topic)	Feeling inexperienced	Subjects of interest versus not being interested
A fear of failure		Frustration (no finance)	
Maintaining optimism		Happy with being right	
Enjoying the creation of a good atmosphere		Inspiration from the client, and employee satisfaction	

When looking into meta-affective components, students seem to be rather *moody*. Evidently, the entrepreneurs' list is longer, and the repertoire much wider. Here again there is one factor which students have skipped when it comes to providing reflection — temperament. This is perhaps understandable, as awareness of one's own reactions tends to come with life experience.

Based on this empirical work, the comparison leads to summarizing the gaps illustrated in map (Figure 2) which concludes important areas of

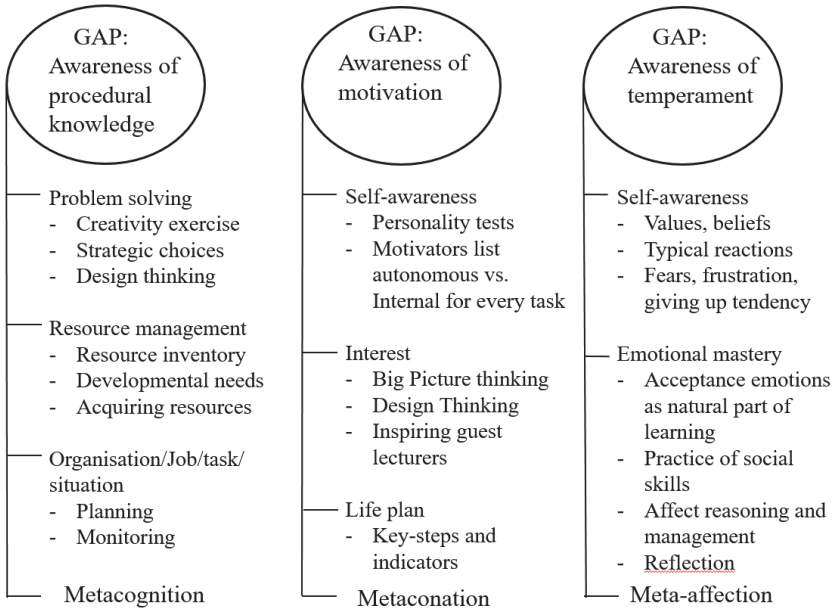

Figure 2. Considering Metacompetencies in Entrepreneurship Education — Calculating Gaps Based on Research Findings.

students' developmental need to support evolvement of enterprising behaviour.

Important aspects to consider for intervention include promoting positive achievement as derived from self-development, from growth. Furthermore, supplying tools and competencies to manage one's own moods and feelings, to become more self-confident, more socially open, and more failure-tolerant. All in all, results indicate that enhancing metacompetencies may be a challenge for teachers. Therefore, focusing on the weakest aspects with specific instructions provides more practical value for educators.

DISCUSSION, AND THE IMPLICATIONS

This paper succeeded to explore metacompetencies reflected by active entrepreneurs together with comparative study of the student sample. The study has critically traced the expressions including three components — metacognition, meta-affection, and metaconation — and witnessed the fact that some patterns occurred more frequently. For instance, the most often-used construction of expressions, is directed starting with an awareness of one's own thinking, which leads to conscious decisions and motivation.

In other words, metacognition has an influence on metaconation. Although the latter is the dominating pattern, it should be said that all other combinations are also available. Moreover, entrepreneurs' expressions were abundant in all components of metacompetencies, cognitive, conative, and affective aspects. We were also interested in events which were connected to metacognitive expressions and, indeed, clear patterns were revealed. Positive emotional states were connected to satisfaction with creating value and customer appreciation, while negative emotions were connected to financial problems. Competition was, surprisingly, described as a motivator or conative aspect. In this light, creating a competitive environment in an entrepreneurship education course should motivate students towards better achievements. The need for achievement was revealed in a volitional context in the form of metaconation, showing perseverance mostly in terms of not giving up, being persistent, and finishing tasks which had been undertaken. This research clearly demonstrates that entrepreneurship domain has unfortunately overlooked this framework, as entrepreneurs can indeed be argued being metacompetent, enabling to hypothesize whether metacompetencies can be the factor which differentiates more entrepreneurial individuals.

Secondly, the outcomes from the study with entrepreneurs were contrasted against similar reflections by students. As a result, important gaps in students' metacompetencies were highlighted. The entrepreneurs' repertoire of self-awareness is much wider and rather more equally distributed throughout metacompetencies. Students, however, show strength in metacognition areas of declarative knowledge, and are significantly less expressive in procedural aspects. Student motivational expressions also delivered rather poor results when compared to entrepreneurs, while volitional strength was better reflected. Not surprisingly there is also a gap in meta-affective reflections. When comparing them to entrepreneurs who are more balanced in all components of metacompetencies, students tend to be more mood-orientated, with less awareness of emotional patterns or temperamental reactions. This is a valuable input when it comes to considering entrepreneurship education (and perhaps not only) in order to develop metacompetencies *per se* or to embed the recommendations into the existing methodology and intervention design so that it is brought closer to a real life context and including self-evaluation or self-observation.

It appears that both students and entrepreneurs equally demonstrate declarative type of cognitive abilities, which is part of metacognition. This is something in which the classic educational system excels. Opposed to this, international student reflections indicate that the educational system is

not much inclined to support their intrinsic motivation and emotional coping needs.

It is vital for the behaviour of entrepreneurs that they own a repertoire of procedural knowledge — how to do things, which way to go, what the other options may be, etc. This can be done by designing different business models, evaluating several strategic options up to the formation of creating an inventory of one's own skills and competencies in order to be able to craft a plan for personal development. There are a good many tools and methods available which support the development of metacompetencies, such as reflection, learning diaries, discussions and debates up to design thinking (Ustav and Venesaar, 2018).

CONCLUSION

This study set out to determine how metacompetencies are expressed within the practice of entrepreneurship, and what kind of gap exists in comparison to students who are obliged to study entrepreneurship. Much of the research up until now has been descriptive in nature, deficient when it comes to providing the empirical data or moreover, practical implication. In particular, this paper contributes providing empirical evidence demonstrating how metacompetencies interact within practice and are used by active entrepreneurs. Secondly, the results confirm the conceptualisation of metacompetencies used in this paper, contributing into indicated shortage of theoretical discussion of meta-processes, specified here as metacompetencies, in the entrepreneurship field. And finally, the practical contribution is addressed to entrepreneurship educators offering the areas of metacompetencies in a need of special attention and intervention.

Returning to the questions posed at the beginning of this study, the results confirm active use of metacompetencies by active entrepreneurs surprisingly evenly distributed between subcomponents which are radically different from the reflections of students. The present results are significant in at least major two respects. Firstly, evidence from expert entrepreneurs clearly demonstrates entrepreneurial situations in which metacompetencies occur and coping strategies are used. Secondly, when using the results from students, significant differences are visible. New gaps were revealed to be vital for educational intervention. When looking closer at the discovered gaps, we may be able to discern a progression of the long ongoing discussion — why some people become entrepreneurs and some do not, why some succeed and some do not. The current outcome seems to suggest that

entrepreneurs develop, i.e. are made, rather than born, through advanced higher order competencies or metacompetencies. Environments which promote self-awareness and self-management, metacompetencies as defined in this work, most likely deliver more entrepreneurial individuals. To offset the gaps which students bring along with them into an educational institution, metacompetencies should be trained. In order to develop an awareness of entrepreneurial life it is important that student experiences imitate those to which expert entrepreneurs are exposed in order to develop similar coping-orientated metacompetencies. To be perceived as credible by stakeholders, students need not only to be literate in business planning and entrepreneurial finance, but also in mastering social interactions, and their own lives.

The findings in this research paper have a number of important implications for future developments. A natural progression of this work is to develop and pilot targeted entrepreneurship intervention while considering the concept of metacompetencies, as well as addressing the gaps that have been discovered. A further challenge for research, and practice, is the time limitation. Can one course make a change and how can the most efficient structure be formed in order that it might have an impact. Considerably more work will need to be done to determine a toolbox or design the training for the development of metacompetencies. This is a research avenue that is open for a great many fields. Metacompetencies as a concept is not reserved for entrepreneurship education only. Procedural knowledge, as an example, can and perhaps should be developed in all walks of education.

The limitations of this work are visible when it comes to demonstrating obvious gaps in terms of the limited sample; it fails to explain the genesis of these gaps. The reasons may lie in cultural or domestic-habitual differences and/or in the educational system, though demographic variables had no relevance. However, reasoning the development of metacompetencies throughout the lifespan is out of the scope of this research, but certainly an interesting topic for future works.

To sum up, the evidence from this study suggests that in order to be able to increase entrepreneurial resources and/or individuals who are successful in life, able to cope with demanding entrepreneurial processes and also with oneself, education should be adjusted to address metacompetencies, especially filling the discovered gaps. For this end, students should be given practice in more real-life experiences during the learning process. Although metacompetencies are introduced in this paper with a focus on entrepreneurs comparing to students, it should be recommended reading when

developing an entrepreneurial university, a subject which is transferable to any other educational setting which is working to develop human resources and an enterprising culture.

Appendix A. A Description of the Sample

Table A.1.

N	Country	Gender	Age	Established	Field of Activity
1	Est	M	26	2009	Dental services and equipment
2	Fin	F	50	1998	Furniture renovation
3	Ru	M	38	2000	Manufactures products from plastic and aluminium
4	Est	M	43	2008	Creek quality food imports
5	Est	M	32	2007	Restaurants
6	Est	F	36	2009	Furniture restoration
7	Est	M	41	1997	Dredging services
8	Est	F	42	2002	Catering services
9	Est	F	52	1992	Pubs and shops in rural areas
10	Est	M	35	2005	Luxury car wash
11	Fin	M	29	2009	Nordic Lounge Oy
12	Fin	M	30	2011	E-cigarettes in Spain
13	Est	M	44	2005	Human resource management for the IT sector
14	Mac	M	26	2008	Web design and development
15	Est	M	62	1995	Agriculture on a family farm
16	Fin	M	67	1975	Photoprint
17	Est	M	30	2000	Event management
18	Fin	F	48	2002	Physiotherapy services
19	Fin	F	46	2004	Furniture renovation and design
20	Est	M	38	1997	Logistics in Russia
21	Est	M	34	2006	B2B software development
22	Ru	F	41	2003	Tourist agency
23	Ru	M	48	1996	Manufacturing awnings and inflatable boats.
24	Est	M	37	2006	Software development
25	Fin	M	53	2000	Georgian wine trade
26	Geo	M	31	2007	IT services
27	Est	M	29	2008	Software development

Appendix B. Interview 1 — Estonian Small Entrepreneur for Four Years. High Level of Metacompetence Shown (Shortened)

I had the will to continue the family business (MCON). The other motivator was money, and also studying and developing myself (MCON)... Had no prior experience (MCOG), and felt pretty *green* (MAF). Financial knowledge and skills were in short supply (MCOG)... I set objectives both for the long and short term (MCOG), costs and marketing efficiency for the short term, for example... I don't like unfinished jobs; when I start don't stop until I'm completely finished (MCON)... I have all of the (business) processes in my hands, and in my head (MCOG)... and tend to use several strategies. Trying one, then another, sometimes a third, until I find what works best (MCOG). The main strategy I have is finish what you started (MCOG). I enjoy taking the lead and taking responsibility, dealing with employees (MCOG). The major setback was after the *bubble* exploded — in terms of finance things were very difficult (MAF), causing frustration and anxiety (MAF). There was a time when I thought of going to work for a salary (MCOG). But I knew my pride (MCOG), this meant that there was no chance of giving up (MCON). I like setting my goals and achieving them (MCOG). It gives me a feeling of satisfaction (MAF). I have that good feeling of achieving something (MAF). I enjoy delivering good outcomes for people (MAF), and positive feedback from them is a great motivator (MCON). I constantly think of business interests (MCOG), looking for places in which I can invest (MCON)... If you don't have a creative mindset, it is very difficult to be an entrepreneur. I always have to think about new options and weigh up the pros and cons (MCOG). Money alone is definitely not a motivator (MCOG). My company's achievements and development motivates me (MCON). Creating new jobs makes me feel good (MAF). Make sure you have communications skills — you can't do anything without them (MCOG). PATIENCE, you really have to have patience. I have a little but should have more (MCON).

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Article IV

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Bridging metacompetencies and entrepreneurship education

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Abstract

Purpose – The purpose of this paper is to explore the concept of metacompetencies in entrepreneurship education through students' expressions of metacompetencies in their learning processes, aiming to provide assistance embedding metacompetencies in entrepreneurship education.

Design/methodology/approach – The empirical study is based on qualitative data retrieved from students' reflections throughout the course, and measures the constructs of metacompetencies in parallel with the acquisition of entrepreneurship course outcomes. The phenomenological analysis is coded to apply Bayesian modelling and statistical validation measures to establish interrelations between metacompetency components and conceptual validity.

Findings – Different degrees of appearance of students' metacompetencies and significant correlations between all three components of metacompetencies are identified. An empirical model of connection between metacompetencies and entrepreneurship education is created, which shows a strong relationship between students' metacompetencies and changes in attitudes, emotions, intentions and interest towards entrepreneurship.

Practical implications – Practical implications are connected with the entrepreneurship course design, supporting the development of students' metacompetencies and self-awareness.

Social implications – Social implications bring learners' physical participation in the courses into the spotlight, influencing students' attitudes towards entrepreneurship. Enhancing metacompetencies as a tripartite model assures that cognitive, conative and affective aspects of learning are in corresponding change.

Originality/value – This paper provides a step forward from theorising metacompetencies, putting this concept in the middle of practice. The empirical model establishes a direct connection between metacompetencies and entrepreneurship education, demonstrating how students' awareness creation through metacompetencies influences changes in interest and intention towards entrepreneurship.

Keywords Training, Entrepreneurship, Education, Metacompetencies

Paper type Research paper

Introduction

The aims of entrepreneurship education have been extending beyond business creation and management skills to students' preparation for work and life. Graduates' employability and success are of concern to universities and are often measured as indicators of educational value. This highlights a weakness of current research (Pittaway and Cope, 2007), which lacks studies linking entrepreneurship education to factors relevant to employability. Almost absent are discussions of educational endeavours that create more successful individuals or a better society. Hence, the primary challenge is to understand how students learn to become enterprising individuals (Fayolle and Gailly, 2008) or manage development in changing circumstances (Haynie *et al.*, 2010; Moberg, 2013).

Policymakers recommend creating a vision of entrepreneurial life in the learning process to which students can relate, allowing them to see the relevance and meaning of entrepreneurship in different disciplines (Henry, 2013). The focus is on encouraging entrepreneurial behaviour, enabling students to relate their learning to academic disciplines and bringing real-life problems to the classroom. Doing that, experts consistently and reliably follow recognisable and highly complex cognitive behaviours and processes (Baron and Henry, 2010; Mitchell *et al.*, 2005). Therefore, learning should be facilitated by

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perceiving the culture of an expert entrepreneur, including attitudes, values and beliefs (Fayolle and Gailly, 2015; Kyrö *et al.*, 2008; Gibb, 2002).

Showing adaptive assimilation with changing technologies and dealing with ambiguity and diversity (Haste, 2001), metacompetencies are transferable competencies associated with skilful learning in diverse contexts. Metacompetencies are crucial in coping with changing entrepreneurship situations and should be considered in syllabus planning (Buckingham and Deakin, 2012). Discussions about metacompetencies in scholarly literature of management and education indicate that they have a higher-order acumen, which is a prerequisite for developing all other skills and competencies (Tubbs and Schultz, 2006; Haste, 2001; Brown, 1993) and for promoting entrepreneurial learning (Kyrö *et al.*, 2011). Moreover, metacompetencies are potential keys to managing a variety of positions in entrepreneurship, gaining individually rewarding outcomes and mastering unique life choices.

In entrepreneurship education, metacompetencies are conceptualised by Kyrö *et al.* (2011) as the interplay between subcomponents of metacognition, metaconation and meta-affection. This tripartite model has been found to be the best predictor of behaviour in myriad studies (e.g. Rosenberg and Hovland, 1960; Hilgard, 1980; Snow *et al.*, 1996; Ruohotie and Koiranen, 2000). Predicting behaviour is at the core of entrepreneurship education research such as in the theory of planned behaviour (Ajzen, 1991) or assessment of entrepreneurial intentions (Chen and Linan, 2009). Metacompetencies are expected to lead change in the latter, so it is interesting to observe how impacts in entrepreneurship education can be delivered. Though advocating metacompetencies in that sense, Cheetam and Chivers (2005) presented their doubts about the assessment of metacompetencies and whether they can be taught in the classroom.

To address these doubts and the lack of abundant research, and relying on indications of the power of metacompetencies, further empirical studies are required.

This paper aims to identify the connection between metacompetencies and entrepreneurship education via the following research questions:

RQ1. What is the practical understanding of metacompetencies? How are students reflecting metacompetencies in an entrepreneurship education framework?

RQ2. Can students be grouped based on the level of metacompetency? How meta-competent are the students?

RQ3. How are metacompetencies connected with entrepreneurship education?

The theory for this research is the concept of metacompetencies comprising metacognition, metaconation and meta-affection in entrepreneurship education. A full-semester entrepreneurship course for international students was shaped to promote metacompetencies and to create awareness about entrepreneurship. Students' learning diaries before, during and after the course are the basis for qualitative and quantitative investigation.

This study provides insight about the theoretical background of the concepts under study. Then, the use of mixed research methodology is explained, and the results are discussed throughout the research process. The conclusion stresses the most important findings and provides recommendations for further research.

Literature review

Based on the aims of the paper following deeper literature background on constructs under study, metacompetencies—including metacognition, metaconation and meta-affection, together with entrepreneurship education changings aims, are given.

Theoretical framework of metacompetencies

According to Fleming (1991), all university education is concerned with metacompetencies, and there is a need to improve the understanding of how knowledge transforms into

metacompetency. However, Illeris (2009) discussed the concept of competence as people with not only knowledge, skills and abilities but also the potential to resolve challenges. He argued that this requires of humans self-consciousness and awareness of what to learn, how to adapt, how to resist failures, and how to deal with challenges, essentially reflecting Fleming's (1991) concept of metacompetencies.

Metacompetencies are presented as a prerequisite for the development of capacities like judgement, intuition and acumen, which competencies require (Brown and McCartney, 1995). Le-Deist and Winterton (2005) framed metacompetencies differently, as the interplay of cognitive, functional and social competence. Despite the variety of conceptualisations, recent research demonstrates consistency in fundamental arguments. Metacompetencies, therefore, are characterised by self-awareness and self-management, involving cognitive, behavioural, and affective aspects, leading to more effective behaviour in various situations (Bourantas and Agapitou, 2016; Savickas, 2015; Nielsen, 2014; Intezari and Pauleen, 2013).

The base model initially described three components, i.e. cognition, conation and affection, as reactions to everything (Rosenberg and Hovland, 1960), and can be found as the basis of Ajzen's (2001) attitude concept. Kolb (1984) suggested that, in addition to knowing how we think and feel, we must recognise when behaviour is governed by thought vs feeling. After Kolb, this tripartite interplay was replicated in research (e.g. Snow *et al.*, 1996), adjusted in entrepreneurship (Robinson *et al.*, 1991; Ruohotie and Koiranen, 2000) and conceptualised as metacompetencies in entrepreneurship education by Kyrö *et al.* (2011).

These latter influences are fundamental in the theoretical framework for teaching and learning entrepreneurship, consistent with the constructivist learning paradigm. This study is based on metacompetencies as an interplay between metacognition, metaconation and meta-affection in entrepreneurship education.

Metacognition

The best studied concept of metacompetencies, metacognition, has been under research for decades and is accepted in Bloom's taxonomy (Kraiger *et al.*, 1993; Krathwohl, 2002). Metacognition refers to one's conscious and cognitive understanding of people, tasks and strategy (Flavell, 1979). Metacognitive knowledge of people reflects perceptions about oneself and others in terms of competencies, weaknesses, thought processes and the comprehension and use of memory. Schraw (1998) drew the distinction between declarative and procedural knowledge. However, Pintrich (2002) claimed that procedural knowledge, including control and monitoring of actions, can be doubted if part of metacognition we tend to agree with acknowledges the strong overlap with metaconation. Yet, with reference to goal setting, strategy planning and monitoring, Haynie *et al.* (2010) argued that foundations of entrepreneurial mindsets are metacognitive and show how metacognition affects individuals' adaption to changing circumstances. Metacognitive thinking can be deliberately practised in entrepreneurial contexts, leading to the creation of entrepreneurial expertise (Mitchell *et al.*, 2005), and increasing awareness about thinking patterns related to greater entrepreneurial success (Ku and Ho, 2010).

It has been proposed that students with more metacognitive knowledge perform better in critical thinking (Magno, 2010), where metacognition advances the meaningfulness of learning (Rahman *et al.*, 2010), creating and upholding interest. Therefore, metacognitive abilities are essential in learning processes, both holding implications for instructional interventions (Livingston, 2003) and representing entrepreneurial ways of thinking. Metacognition is equally beneficial to students with lower and higher intellectual abilities, but not all students can develop awareness or monitoring of learning without external help.

Metaconation

After Hilgard (1980) found the construct of conation in unfortunate ignorance, the gap started to fill up. In his provisional taxonomy, Snow (1996) underlined that aptitudes are not strictly cognitive. Furthermore, he claimed that self-regulation, defined as voluntary action management, has become the overarching conative concept and is therefore close to Zimmerman's (1995) concept of self-regulation. Students' ability to self-regulate can be explained by the degree to which they are metacognitively, motivationally and behaviourally active in their learning processes, or how much they personally initiate and direct efforts to acquire knowledge.

Metaconation is most closely linked to behaviour, and is defined here as awareness and ability to manage motivation and volition. Motivation in entrepreneurship studies includes achievement orientation, constructs reflecting individual differences in needs, goals and the time perspectives associated with them, various self-related constructs and attitudes regarding actions, objects and goals (Kyrö *et al.*, 2011; Ruohotie and Koiranen, 2000; Snow *et al.*, 1996). Taatila (2010) found that motivation and attitude constitute a significant element in success, and emphasised the study of motivation in entrepreneurship education.

To lead to concrete action or behaviour, avoiding distractions and occasional impulses (Heckhausen and Kuhl, 1985), motivation needs to be accompanied by will. Will, also referred to as volition or willpower, is defined as purposive striving, including various action controls and strategies. The latter is close to the notion of self-regulatory strategies and mindful effort investment in learning. It is tightly connected to cognition in order to take conscious commitments and in cases where behaviour is based on a decision, values and interests (Corno, 1989).

When metacognitive strategies are seen as having a direct effect on student achievement, motivational and affective components are assumed to support the use of these strategies.

Meta-affection

Watts (1998) defined meta-affection as the conscious awareness, monitoring, regulation and evaluation of intrapersonal and interpersonal affective activity. Affection comprises different characteristics, including emotions and other affective states such as mood and temperament (Kyrö *et al.*, 2008; Ruohotie and Koiranen, 2000; Snow *et al.*, 1996). The study process involves more than a positive affective state for high motivation and learning. It may involve and even requires negative affective states like problem-solving frustration (Boulay *et al.*, 2010) or feeling difficulty (Efklides, 2009). On the other hand, people experiencing harmonious work-related passion readily and autonomously undertake work-related activities (Shepherd and Patzelt, 2018). Meta-affection is a phenomenon recognising own feelings and consciously addressing them to harmonise, providing an input into will and taking action towards desired targets.

Various emotional considerations in entrepreneurship education have been proposed (e.g. Gibb, 2002; Illeris, 2009; Kyrö *et al.*, 2011; Lackéus, 2013). Awareness and emotional adaptability are needed to maintain motivation, to concentrate, overcome fear and manage time. Though these abilities are not directly related to students' cognitive processes, they can strongly affect performance.

Metacompetencies are seemingly adaptive, enabling manipulation with other competencies (Fleming, 1991), management of motivation and emotions (Haste, 2001) or deliberate growth and use of capabilities (Bogo *et al.*, 2013). Therefore, self-awareness and consciously controlled direction of individual cognition, conation and affection are crucial in creating metacompetencies. While the theoretical foundation of metacompetencies follows some general understanding, the application and disposition of metacompetencies in entrepreneurship education are completely unexplored (Lackéus, 2013).

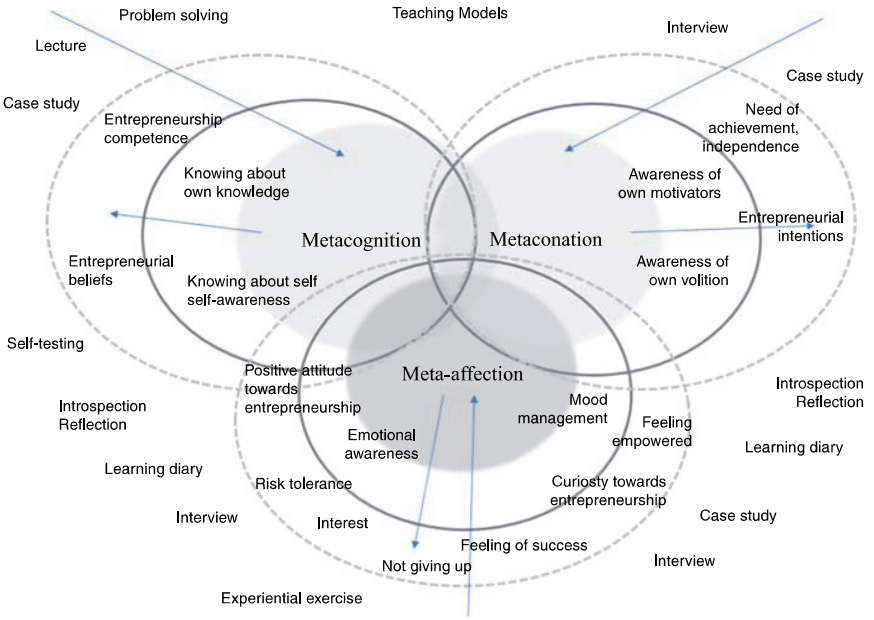
Measuring metacompetencies

Three research papers measure metacompetencies empirically. First, Kyrö *et al.* (2011) built a theory about metacompetencies using a qualitative assessment with grounded theory. Second, an empirical study of nursery education created a questionnaire for specialty needs (Bogo *et al.*, 2013). Finally, a third assessment instrument (Ustav and Venesaar, 2013; Ling *et al.*, 2013), for wider use, was built on Haynie's (2005) questionnaire, which originally measures metacognitive abilities in entrepreneurs. The 55-item questionnaire has not been used here because of the multi-dimensionality of the study, which includes metacompetencies and aspects of entrepreneurship education and theory-building; the expressions of metacompetencies are taken as they appear originally in students' learning diaries.

Aims and means of entrepreneurship education

The main purpose of entrepreneurship programs was initially preparing students to start their own businesses (Garavan and O'Cinneide, 1994), and looking into their entrepreneurial intentions. But a new need has risen, linking entrepreneurship education also to employability (Pittaway and Cope, 2007). Understanding how students learn entrepreneurism (Fayolle and Gailly, 2008) or manage development in changing circumstances (Haynie *et al.*, 2010; Moberg, 2013) is the focus and challenge of today's entrepreneurship education. Therefore, educational processes and structure should also be important variables for inquiry (Jack and Anderson, 1999).

Metacompetencies show that adaptive assimilation, dealing with ambiguity and diversity (Haste, 2001), generally has higher-order acumen, a prerequisite for all other skills and competencies (Tubbs and Schultz, 2006; Brown, 1993). Therefore, metacompetencies are transferable competencies associated with skilful learning in diverse contexts (Figure 1).



Source: Authors

Figure 1.
Theoretical model for research

Metacompetencies are crucial to coping with changing situations of entrepreneurship, and should be considered when planning syllabus (Buckingham and Deakin, 2012).

It is recommended that learning achievement be facilitated by observing expert entrepreneurs' attitudes, values and beliefs (e.g. Fayolle and Gailly, 2015; Kyrö *et al.*, 2011; Gibb, 2002) that reflect metacognitive abilities. Metacompetencies and their three components (metacognition, metaconation, meta-affection) constitute the core of the current theoretical research model (Figure 1). Metacompetencies express humans' self-consciousness about knowledge, awareness of motivation, volition and emotions. The latter relates to a set of entrepreneurial learning components like attitude, interest and intention. For example, students with low levels of metacompetencies may need different teaching models than those with high levels of metacompetencies.

We must acknowledge that widespread rise of entrepreneurship courses in higher education has not been accompanied by rigorous, consistent and sustainable programme evaluations, or a proper mix of means, creating uncertainty about course design and curricular and instructional aims (Fayolle and Kyrö, 2008; Matlay and Carey, 2007). This may be because learning process is always individual, and therefore unique, and teaching entrepreneurship to students from different disciplines requires a different approach. While business students are expected to know why they learn entrepreneurship and are interested, this may not be true in other disciplines. In universities, teaching models that address students from a variety of backgrounds should be considered.

Students' backgrounds often influence their attitudes and motivation to learn in general (Obeidat, 2005). When study does not fit with students' available cognitive schemas, new concepts not directly related to areas of specialty may seem meaningless. Creating interest is a challenge for teachers in non-economic students and even more so in students with prior negative attitudes about entrepreneurship. Oosterbeek *et al.* (2010) showed that an increased and more realistic self-perception correlates with decreased entrepreneurial skills and intentions. Oosterbeek *et al.* (2010) argued that the reason for lost optimism for entrepreneurship results from facing the realities of what is needed for entrepreneurship. Other factors, such as compulsory participation, insufficient credit for the effort required or uninteresting curricula, may also have an effect.

Individual interest is an enduring and stable preference for certain topics or activities (Schiefele, 1991) and is expressed in cognitive, emotional and value terms in which there is strong subjective meaning and self-intentionality. There is evidence that high-interest learners achieve deeper understanding than low-interest learners. However, it is not clear how high-interest learning differs from the learning of extrinsically motivated learners, or how interest and quality of learning outcomes relate (Schiefele, 1991). Hence, interest and intent will be considered in this paper as constructs of interest for closer investigation.

Beliefs, interests and motivations are proven to be part of this discursive repertoire that people in a variety of social situations use to describe others or explain their actions (Roth and Hsu, 2009). Therefore, entrepreneurship-related attitudes, motivations and emotions are chosen as constructs, reflecting the quality of entrepreneurship. To achieve that incentive of making sense of motivation, emotion and volition, and to interact with fellow learners or the environment (Illeris, 2009), research on entrepreneurship education has acknowledged the importance of reflection. Developing individuals, through this critical ability, ensures the continuing viability of businesses by enhancing the capacity to develop a richer understanding of entrepreneurial processes (Jack and Anderson, 1999).

There is a consensus that all learning sequences should contain elements of reflection, either as an integral part of the learning process or as subsequent learning-focused

evaluation, to turn experiences, knowledge and skills into competencies (Illeris, 2013). Masui and De Corte (2005) in their intervention study found that reflection advances both metacognitive and conative aspects. Therefore, the teaching model for intervention is based on experiential reflective practice. Interviews and case studies are designed to create awareness of entrepreneurs' lives, emotions and motivations. Discussion, self-testing and introspective exercises build self-awareness of enterprising or entrepreneurial beliefs and abilities.

In conclusion, entrepreneurship is the practice of play, empathy, creation, experimentation and reflection (Neck *et al.*, 2014). No single theory or practice leads to a goal, and no one single methodological approach is the solution to a problem. For example, taking the positive results of design thinking involving humour and role play (Huq and Gilbert, 2017) creates various questions. For example, can it work because of the creation of positive emotions, interest and motivation, or does role play create self-awareness? In that sense, the methods of design thinking are actually favouring the development of metacompetencies. Hence, when the aims of intervention in entrepreneurship education seek higher levels of employability, intrapreneurship, entrepreneurship and real-life success up to critical thinking about human behaviour and values (Robinson *et al.*, 2016; Jones and Matlay, 2011), the big picture, or systematic look, is neglected. In the realm of business education, teaching metacompetencies has not been a central focus. Intezari and Pauleen (2013) recommended developing a student of wisdom, and further studies on metacompetencies essential.

Methodology

Research design

The aim of this research is complex, involving methodological choices aiming to explore the concept of metacompetencies in students' learning processes with entrepreneurship course objectives. Therefore, the study design (Figure 1) is multi-dimensional, involving two parallel theoretical lines and three interdependent research questions. This requires a mixed methodology to convert students' reflective statements into measurable categories with small samples for statistical assessment.

The base of this study is the tripartite theoretical concept of metacompetencies and their components (metacognition, metaconation and meta-affection). Constructs like entrepreneurial attitudes and intentions, aspects of emotions, motivation and interest towards entrepreneurship study are under evaluation.

The first research question was addressed with phenomenology, a familiar methodological principle by Husserl's (1962) scientific knowledge, which begins with a fresh and unbiased description of the subject matter. It reflects the distinctive characteristics of human behaviour and first-person experiences, enabling detailed and systemised descriptions of phenomena. The object of phenomenological research is human experience (Giorgi, 1988), allowing the exploration of many individual perceptions.

The second research question required the conversion of conceptual variables into statistically comparable measures. A concept map is a useful tool to separate construct layers and density while maintaining conceptual meanings of key concepts, principles and interactions (Novak, 1990). The results of concept mapping enable differentiation by seating the values on Likert scales.

The third research question used the Bayesian dependency modelling (BDM) method to establish dependencies and interactions for quantitative data analysis. According to Tirri (1999), Bayesian approaches are ideal for education, producing small data sets with many measured issues and an emphasis on hierarchical models. With similar type of variables, studying self-awareness and self-management of School principals, Bayesian technique is successfully adopted by Nokelainen and Tirri (2007).

Based on students' reflection on the components of metacompetencies and changes during the intervention of the entrepreneurship course, the results help identify the connection between metacompetencies and entrepreneurship education.

Description of the entrepreneurship course: the intervention

An important basis for the study was a carefully designed, full-semester introductory course of entrepreneurship for non-economics students under the international study programme. Teaching methods were chosen to increase students' self-awareness and awareness of entrepreneurship to promote creative and abstract thinking, reflection and interaction. Embedded into entrepreneurship process, a homogeneous and compact programme was compiled. The course was compulsory for graduate information technology and undergraduate international relations students, avoiding self-selection bias (Fayolle and Gailly, 2015). So, we can claim that the course was not chosen by students motivated by interest in entrepreneurship.

Self-awareness was promoted with tools like interactive role play, psychological tests and different social settings, stimulating entrepreneurial ways of doing, thinking, organising and communicating based on guidelines from Gibb (2007). Creation of awareness about entrepreneurship (to look for metacompetencies) was guided by deep interviews with an entrepreneur, a case study of and open discussion with a guest entrepreneur, abstract business modelling exercises for future business models and identification and shaping of personally relevant business opportunity prototypes. The use of different tools was planned in accordance with each learning outcome and progression based on the entrepreneurship process to achieve homogeneity and a holistic view of entrepreneurship. Students made their own schedules and homework choices.

The sample and data collection

The sample (Table I) consisted of international students of 21 nationalities at Tallinn University of Technology. The integrated entrepreneurship course involved students from non-economic IT specialties and the business side of international relations. For most of the students, the course was obligatory. While students of international relations were divided fairly evenly between females (60 per cent) and males (40 per cent), most information technology students were male (90 per cent). The sample comprised data from 99 students, and 98 were suitable for coding.

The base of this study is the tripartite theoretical concept of metacompetencies and their components (metacognition, metaconation and meta-affection). Constructs like entrepreneurial attitudes and intentions, aspects of emotions, motivation and interest towards entrepreneurship study are under evaluation.

	Count	%		
	N	Male	Female	Total
Sample	99			
Undergraduate	26	40	60	100.0
Graduate	73	90	10	100.0
International relations	25	36	64	100.0
Information technologies	74	89.0	11.0	100.0
Estonians	41	85.4	14.6	100.0
Other nationalities	58	67.2	32.8	100.0

Table I. The sample

Source: Authors' calculations

The database was pre-planned, qualitative learning diaries in which students reflected their thoughts, feelings and beliefs before, during and after the course. Data collection was performed after the course was finished but before the exam and final grading to avoid or minimise the effect on results.

Data analysis

Data analysis is based on information collected during the course, which is the basis for coding. The coding system (Table AII) relies on a Likert scale.

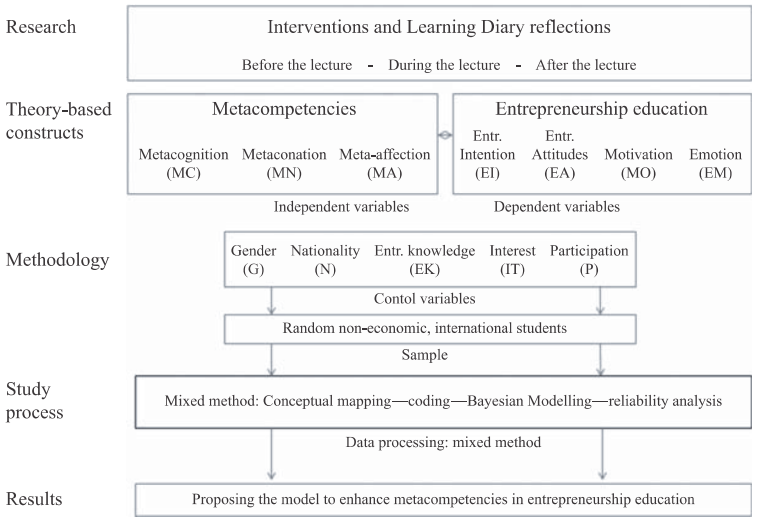
This study follows Giorgi's (1985) four steps of phenomenological research. First, the material is read and reread to facilitate understanding of the whole and allow demarcation of spontaneous shifts in meaning or meaning units with a psychologically sensitive interest in the phenomenon under investigation. Next, these reflections and insights are synthesised into a consistent statement expressing the psychological structure of the experience. Along with this, expressions showing metacompetencies (Table AI), the primary meaning units, were marked.

The second step of the study was narrowing down the information, for which a concept map was used (Figure 2; Novak, 1990) to make the subject matter more conceptually transparent; emphasise the meanings of key concepts, principles and interactions; and create conceptual understanding of the subject.

The structure of concept maps for this study helps evaluate changes from the course. The coding system (Table AII) relies on a Likert scale.

For quantitative data analysis, the BDM method was used. BDM is a probabilistic graphical model. These graphical structures represent knowledge about uncertain domains (Nokelainen *et al.*, 1999). Each node in the graph represents a random variable, while the edges between the nodes represent probabilistic dependencies between the corresponding random variables (Ben-Gal, 2007).

Because of the study design and database, some self-evaluation bias is expected. Therefore, qualitative outcomes were alternatively statistically tested with Cronbach's α for



Source: Authors

Figure 2.
Research design

internal validity and the Pearson correlation coefficient. A confirmative follow-up longitudinal study and/or repetitive studies with different samples in new environments would help validate the choice of methods.

Results

Metacompetencies reflected in entrepreneurship education

Research began with the exploration of metacompetencies in entrepreneurship education. While reading the students' reflections, theoretical markers reflecting metacompetencies (Table II) were assembled. It appears that, in entrepreneurship education, metacognition occurs mostly when students reflect on their attitudes and beliefs or on prior knowledge about entrepreneurship. Awareness of expectations for the course and learning aims were less frequently expressed. During the course, metacognition occurred when students compared existing knowledge to new knowledge and re-evaluated their beliefs. Metaconative reflections were found in discussions about motivation and volition connected to the course, and meta-affection when emotional aspects were discussed in connection to achievements and concrete learning situations, like presenting, being engaged or resulted by the change of thought.

Repeating patterns and reflections of attitudes are visible in students' reflections. Students possessing different levels of awareness of thoughts, feelings and causes of behaviour (Table III) became apparent, from the excessive use of passive voice to richly expressed reflections of beliefs, emotions and habitual patterns. For example, an excerpt from student *N*9's essay shows abundant manifestation of metacompetencies: "When you are motivated, then it is not difficult to force yourself [conation]. I never had the feeling [meta-affection] that I don't want to go to the class. I am very happy [meta-affection] having it, otherwise I would still be thinking [metacognition] that entrepreneurship is something scary and extremely difficult to understand".

In the first sentence, awareness of cognition, conation in terms of motivation and volition and affective states can be identified. Looking at meta-affective statements, long-term emotional state and situational feeling can be recognised, while metacognitive expression, following theoretical conceptualisation, is declarative in nature. Student *N*53 shows general explanations and excuses but no indication to self-awareness as presence of

Table II. Markers for metacompetencies in learning environments

Metacognition	Metaconation	Meta-affection
Recognising thoughts about entrepreneurship	Setting and monitoring goals against actual behaviour	Recognition of feelings connected to entrepreneurship and the course
Expectations set for the course	Awareness and monitoring achievements	Recognition of moods and feelings in different learning situations based on engagement
Thinking of entrepreneurial abilities and qualities	Awareness of will and perseverance, action control	Predicting feelings as self-awareness
Recognising and correcting thoughts and opinions about entrepreneurship	Expressions of external and internal motivational influencers	Noticing overcoming fears and changes of emotional states before and after home tasks
Recognising and questioning thoughts about suitability of entrepreneurship course to professional studies	Awareness of time management and participation habits	Expressing strong emotions in social situations, expressing ideas
Drawing comparisons with prior knowledge and experiences	Reasoning and analysing behaviour	Understanding the change of emotions before, during and after the course

Source: Authors' compilation

*N*1	In the beginning, I was thinking to pass the course somehow but after attending several times it was quite interesting for me. I was feeling excited mostly during the lessons. This is why I was attending as much as I could
*N*9	When you are motivated then it is not difficult to force yourself. I never had the feeling that I do not want to go to the class. I am very happy having it, otherwise I would still be thinking that entrepreneurship is something scary and extremely difficult to understand
*N*14	I generally do not do a lot of planning. Unfortunately, I am too lazy to do it. My approach mostly is—"I will manage something". Well, that did not pay off quite well. I should have managed to get a higher grade in this course, but I did not, should have put a little more effort
*N*41	During standups, I felt discomfort but I know that I am growing and for that it is necessary to push myself
*N*43	I thought the entrepreneurship course would be unbearable. Becoming an entrepreneur had never crossed my mind until this course began. I started to think about entrepreneurship as an option for me as well, rather than some career option for business-oriented workaholics
*N*53	I did not expect anything of major importance to me. The course is compulsory so there was no choice and one cannot just quit it. I did not participate in the seminars, because I had another course at the same time. I think one either has the entrepreneurial spirit or does not have. The rest comes from planning, research, funding, marketing, and also luck is one factor. I do not think taking courses on entrepreneurship helps much. I do not think entrepreneurial ability can be learned

Source: Authors

Table III. Examples of expressions including self-awareness and metacompetencies

metacompetencies. Moreover, *N*53 is an excellent example of a student who did not participate in lectures and claimed no change in beliefs about entrepreneurship. However, student *N*14 is aware of their conative pattern, student *N*1 is aware of emotional states and student *N*41 shows conscious control over situational feelings.

We analysed expressions of metacompetencies (Table AI) to ascertain the main situations and appearance in entrepreneurship training. Metacognition was mainly connected with awareness of thinking about entrepreneurship and having set expectations for course outcomes. Some students expressed awareness of skills and abilities in entrepreneurship, which for many occurred to be wrong as they later admitted. Typical also was drawing comparisons with prior knowledge or experiences in entrepreneurship courses or information at hand, presuming the course would be full of economics and boring lectures.

Metaconation occurred when students analysed their behaviour and intentions towards entrepreneurship throughout the course. Many reflections concerned motivational aspects, achievement orientation and awareness of personal objectives. Although we reviewed research papers considering goal setting and monitoring part of metacognition, our study shows that goals and monitoring have strong metaconative characteristics ("My goal was to do home works on time and attend 90% and that I did; I can't fail any courses because I need all the ECTCs I can get"). The will component was also expressed ("[…] if the motivation gets lower, I have to push myself"). Meta-affective states were divided between more stable personality factors ("I feel discomfort when presenting; scared to speak out") and situational moods ("seeing this course in my syllabus made me feel worried, confused; I had frustration with interview").

In conclusion, students have different levels of awareness of thoughts, feelings and motivations, enabling measurement of metacompetencies. Based on the theoretical conceptualisation given in this paper, metacompetencies can be allocated based on the tripartite theoretical ground of metacognition, metaconation and meta-affection.

Students' differentiation by degree of appearance of metacompetencies

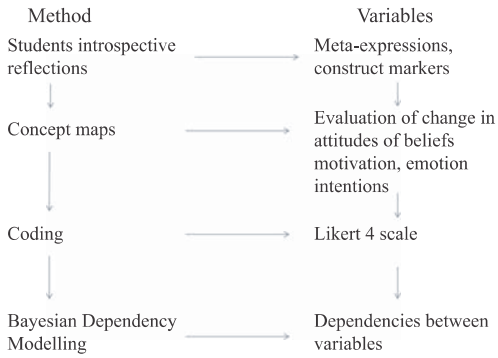
Concept maps were compiled (Table IV) to help differentiate students based on the metacompetency level. This enabled multi-dimensional analysis of qualitative information to be compressed and evaluated for changes.

	Before course	During course	After course
Cognitive awareness expressions	I thought entrepreneurship is scary and extremely difficult to understand	My goal was to get to know the subject more as I pretty much knew nothing about it	The course definitely changed my mind. I had many false opinions
Affective awareness expressions	I was a little afraid, sceptical. I was afraid of the word "Entrepreneurship"	I never had the feeling that I do not want to go to the class	Now I am actually very happy that the course was in our syllabus
Conative awareness expressions	I want to achieve good grades. I am taking my studies seriously	I try to force myself to focus as it was the last class of the week; sometimes it was difficult, all home works together	I am very active outside the school. I rarely think about quitting when I already started. I would try self-employment

Source: Authors

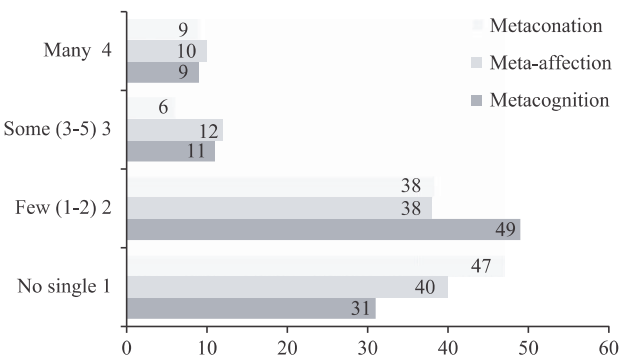
Table IV.
A sample of the concept map

We can evaluate students' evolution throughout the course horizontally and different meta-expressions vertically. The coded values (Table AII) came from the frequencies of the statements put on a four-point Likert scale. Students' reflections varied from no expression to high (Figure 3) self-awareness. Coded results (Figure 4) show that about 10 per cent of the students reflected great awareness of thinking, feeling and acting.



Source: Authors

Figure 3.
Data processing sequence



Source: Authors' calculations

Figure 4.
Division of students by expressed metacompetencies

However, fewer than half of the students did not reflect any awareness (40 per cent for meta-affection, 47 per cent for metaconation and 31 per cent for metacognition). Furthermore, 49 per cent of the students had few expressions showing metacognition, while 38 per cent showed little meta-affection and metaconation. Finally, a small number of students showed some metacompetencies (11, 12 and 6 per cent for metacognition, meta-affection and metaconation, respectively). Students expressing high levels of metacompetencies scored high in all three components. Students with lower levels tended to be better at metacognition, perhaps because it is easier to be aware of thoughts than emotional and behavioural influences.

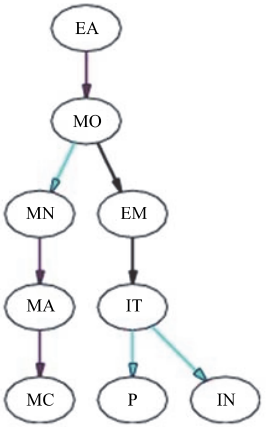
Interrelation of metacognition, metaconation and meta-affection

Further, the study aimed to find the connections and interrelations between variables of the study, as well as correlation and validation measures. A coded database was prepared for statistical analysis using BDM. At first, all the components (Figure 5) were included to illustrate connections. However, BDM does not allow the ascertainment of causality. Still, the theory of inferred causation allows speculation about causalities that have caused the model's dependencies. BDM's 72.4 per cent predictive performance rate confirms assumptions that metacognition, metaconation and meta-affection are tightly related and connected to learning through different attitudes and motivations.

First, a strongly modified group of metacompetencies was observed in conjunction with entrepreneurship-related change in attitudes (EA), motivation (MO), emotions (EM) and other aspects of the entrepreneurship course.

It makes sense that emotions are connected to interest, which supports students' self-employment intentions. Surprisingly, this model indicates that course participation is relevant and connected to the creation of interest towards entrepreneurship. This raises the question of how to create interest or change attitudes through online courses.

Moreover, we acknowledge that previous knowledge or entrepreneurial experience has no link to the main model and is only related to the perceived difficulty of the entrepreneurship course. This explains why students with a background in entrepreneurship were not motivated to participate in the course and why their attitudes were not subject to change. At the same time, students with high participation rates showed a remarkable change in attitudes and intentions. This corresponds to Fayolle and Gailly's (2015) argument that aiming



Source: Authors' calculations

MN	Metaconation				1/
MA	Meta-affection	EM	→	MO	billionth
MC	Metacognition	IT	→	EM	billionth
MO	Motivation	MN	→	MA	millionth
EM	Emotion	MA	→	MC	millionth
IT	Interest	EA	→	MO	millionth
IN	Intention	Curr	→	Gen	1:71351
P	Participation	MO	→	MN	1:74
EA	Entr. Attitudes	Curr	→	Age	1:59
Gen	Gender	Curr	→	N	1:11
Cur	Curricula	IT	→	P	01:05, 8
N	Nationality	EK	→	DI	01:03, 4
Age	Age	IT	→	IN	01:02, 6
DI	Perc-difficulty	Gen	→	DI	01:01, 4
EK	Entre. knowledge				

Figure 5.
Bayesian modelling results and the ratio changing the probability of the original model when an item is removed (items with arrows)

to increase students' awareness of entrepreneurship can be counterproductive for students who were previously exposed to entrepreneurship. This problem can be addressed by creating motivation for participation, even if students show confidence or prior knowledge or attitudes.

In the model, attitudes and beliefs are base factors with strong connections to motivation, emotions, interest and metacompetencies. The search for correlations (Table V) shows that attitudes are significantly positively correlated with all constructs in this study, excepting prior knowledge or experience of entrepreneurship. Therefore, changes in attitudes can occur regardless of previous experience or knowledge. However, we should be cautious about this finding as only 12 participants in this study mentioned prior knowledge or experience. Regardless, the model recommends that student attitudes and beliefs about entrepreneurship be targeted and made central in the course.

As the dependency between variables is not one-directional, the model may also indicate that metacompetencies influence changes in motivation, promoting changes in attitudes. Therefore, the model may suggest motivation as the intermediator between metacompetencies and entrepreneurial learning when attempting to influence students' interests, intentions and attitudes related to entrepreneurship.

Additionally, separate characteristics like gender, nationality and age stand out clearly from the main group of metacompetencies (MC, MA and MN) together with EA, MO and EM and other aspects of the entrepreneurship course. This supports earlier studies claiming no gender variance for metacognition (e.g. Urban, 2012), as here it applies to all metacompetencies in addition to other demographic variables. This is significant as, similarly with studies of metacognition, it can be claimed that every student has the same opportunity to access metacompetencies for personal success.

Reliability calculations were performed on the data. Based on the Pearson correlation matrix (Table V), this research model reflects a strong and significant correlation ($r = 0.7$) between metacognition, meta-affection and metaconation similar to BDM. This applies to the entire model.

The Pearson correlation rejects prior knowledge about entrepreneurship (EK) as irrelevant. The meaning for entrepreneurship education is that students with different backgrounds and prior entrepreneurial knowledge are welcome.

Cronbach's α was calculated for the overall research concept, including metacompetencies and factors reflecting the learning process. The results showed strong reliability ($\alpha = 0.84$), reflecting a successful coding process and variable selection. Cronbach's α was also calculated for the concept of metacompetencies and showed good reliability for the theoretical concept with $\alpha = 0.86$.

	N	IN	IT	EM	MO	EA	P	MA	MN	MC
IN	98									
IT	98	0.460**								
EM	98	0.328**	0.666**							
MO	98	0.347**	0.633**	0.804**						
EA	98	0.470**	0.566**	0.548**	0.611**					
P	98	0.525**	0.467**	0.398**	0.480**	0.507**				
MA	98	0.091	0.378**	0.364**	0.413**	0.383**	0.209*			
MN	98	0.152	0.391**	0.431**	0.472**	0.282**	0.282**	0.702**		
MC	98	0.248*	0.430**	0.376**	0.437**	0.406**	0.324**	0.655**	0.683**	
EK	98	0.126	0.01	0.104	0.051	−0.147	−0.029	0.009	−0.066	−0.134

Notes: *,**Significant at the 0.05 and 0.01 levels, respectively
Source: Authors' calculations

Table V.
Pearson correlation matrix

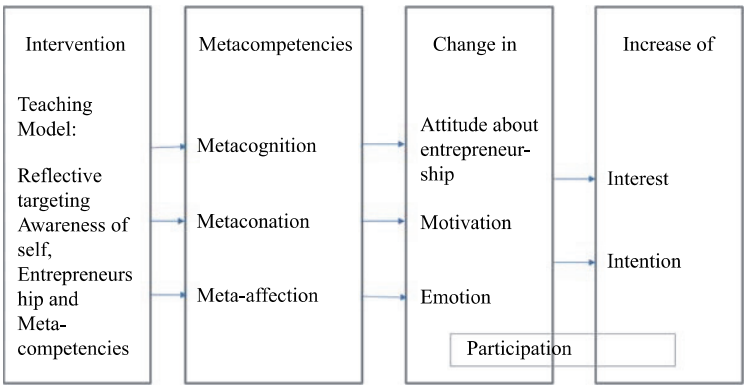
The model positioning metacompetencies in entrepreneurship education (Figure 6) were drafted from the results. The intervention addressing the metacompetencies directed positive, sometimes radical, change in entrepreneurship-related beliefs and attitudes and in awareness and management of motivation and emotional states. This created positive change in entrepreneurship-related interests and intents. An additional and interesting finding was that one factor in creating positive change was course participation.

To summarise, the use of a multi-dimensional study design made it possible to achieve a model of the connection between metacompetencies and entrepreneurship education. The model demonstrates that by using reasonable teaching models and embedding metacompetencies into entrepreneurship education, the intervention supports the development of students' interests and intentions towards entrepreneurship. Students' participation in the course facilitates that impact.

Conclusion

This methodologically complex empirical research explains successfully and reliably the research questions under study. The study process outlined all awareness-related expressions of metacognition, metaconation and meta-affection based on a theoretical discussion. This study has confirmed the concept of metacompetencies, demonstrating that metacognition, metaconation and meta-affection are interrelated, strongly correlated, in possession of high internal validity. An empirical model of the connection between metacompetencies and entrepreneurship education contributes to the theoretical discussion of metacompetencies' impact on changes in students' attitudes, motivation, emotions, interest and intentions towards entrepreneurship. It follows that, for the development of students' metacompetencies, the course programme should include the teaching models that support the development of all three metacompetencies.

Second, it was found that students can be differentiated based on levels of metacompetencies. Only about 10 per cent of the students demonstrated high levels of all three components of metacompetencies. Metaconation presented the biggest challenge, with 47 per cent of students indicating no awareness of motivational and volitional triggers or strategies. As self-managing and goal-oriented behaviours like persistence are foundations of entrepreneurial behaviour, this should be taken under closer observation when designing entrepreneurship education programmes. Creating an awareness of conative, cognitive and affective standings should lead to new pedagogical teaching models. As indicated, the development of metacompetencies can be influenced through



Source: Authors

Figure 6.
Empirical model of connection between metacompetencies and entrepreneurship education

different teaching models. At the same time, the levels of students' metacompetencies can influence the use of teaching models.

A set of interventions focused on students' awareness creation (self-awareness and awareness of entrepreneurship, changes in students' attitudes, motivations to study it and emotional states) was assessed and attached to the model of metacompetencies. Using BDM and statistical correlations, a visual model with strong constructs was established. Changes in attitudes towards entrepreneurship are tightly connected to levels of metacompetencies and changes in motivation and emotions. The latter is directed to increase students' interest and intentions towards entrepreneurship.

A significant finding was the importance of participation in class. Students with low or no participation, regardless of homework completion and grades, had no changes in attitudes, interest or intentions about entrepreneurship. Students with active participation reflected moderate to radical changes. This is empirical proof to Fayolle and Gailly's (2015) argument that aiming to increase students' awareness of entrepreneurship can be counterproductive for students who were previously exposed to entrepreneurship. Students with firmed attitudes participated least, but many students who came to class formed new perspectives and beliefs. Therefore, inventory of previous learning and experiences is part of the study, and requires deeper, more focused research.

The demographic variables also produced findings. Earlier research has established no correlation between metacognition and gender (Urban, 2012), and that seems to apply to all metacompetencies. Based on Bayesian and Pearson correlation calculations, the main configuration of constructs entirely neglected age, nationality and gender. It reflects the pattern of international students in the sample, once studying abroad, they have already established self-management and at least external motivation for study.

It can be stated that entrepreneurship education has a framework to pass knowledge and skills needed for entrepreneurship by creating the awareness and questioning beliefs and capabilities through social settings and interaction. Proposed interventions therefore demonstrate that creating awareness is less about teaching and more about enabling and coaching discovery and awareness, stressing the central role of creating insight and reflective learning. This is important as entrepreneurship education is, for most learners, future oriented, and tangible application is not immediate. It is recommended to train learners in metacompetencies so they may be prepared and active in any new situation.

This study is limited by evidence only to a study programme of entrepreneurship education and a lack of comparative studies. This indicates future studies involving new samples and different environments. Future studies should examine each aspect of metacompetency, developing detailed instructions to design systematic interventions in entrepreneurship education, as well as longitudinal effects on students' success and choices. Nevertheless, the impact of metacompetencies to empower entrepreneurship education has been established as an important format for intervention.

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Appendix 1

Metacognition		Metaconation		Meta-affection	
Entrepreneurship has always been on my mind for long time	I do not like too much details for subjects which are not my specific	My goal was to do homeworks on time and attend of 90% and that I did doing poorly is not an option	I cannot fail any courses because I need all the EAPs I can get	Surprised having the E course exciting	Afraid of the word entrepreneurship
I am thinking to become an entrepreneur now	Expected boring lectures on economics with formulas and calculations	I would say I put 80% into the course if I am being honest	I still think I do not have the will to start my own company	I had Fun	I got a bit anxious
I have promised myself to try to do all tasks on time	I actually thought it will be another economic subject	This class made me more inclined to keep an eye open for an opportunity	Concerning time management I almost always have difficulties	I felt the course very enjoyable	Before the course I was worried
They really made me think a lot of what I have never thought of	I would be still thinking that E is something scary and extremely difficult to understand	My motivation is always my career building	not glad to mention but mostly my motivators are approaching deadlines	I was happy to have this course	Finance is difficult for me
I changed my mind in relation to entrepreneurship	I had many false opinions before when I was not familiar with the subject at all	things that motivated me to do well in this course was my ambition	we could not find financing and at some point we gave up	This felt like a breeze	Confused having this course in my Syllabus
Now I understand that I was wrong in some of my beliefs	I was thinking “I am studying at technical faculty. Why I need that subject?	I am now more inclined to attend such talks and take part in such workshops	I like to keep to a known path	It really helped me in pulling out the stage fear from myself	I do consider lectures boring
I think I am doing quite well in this case	I understood that I might be wrong and now I can honestly say I was wrong	I am growing and for that it is necessary to push myself	I usually do not like and therefore avoid group works, public discussions, etc.	Most inspiring was the interview, it felt like going through his experience (I always wanted to come to lectures/ practices) I had good emotion about them	For me it is embarrassing to fail
I understood it can be useful for further life	I thought the entrepreneurship course would be unbearable	I always wanted to come to lectures/practices	My success must be faster than my parents ageing speed, so I cannot stop	I already feel that I have this “what is going on” attitude	Felt frustration with that interview scared to stand out and speak
It made me think a lot about things				It was fun to always do something	During standups I felt discomfort
I never contemplated on				I felt having respect towards entrepreneurs	I was trying to overcome my fear of public speeches
Lots of ideas were born in my head					I had the problem with the fear of starting

Table AI.
Most-used markers of metacompetencies connected to entrepreneurship education

Appendix 2

Code	Measured construct	1	2	3	4
EA1 EA2	Entrepreneurship attitude before (1) and after (2) the course	Negative, for "chosen" ones, etc.	Indifferent, not interested	Some curiosity, want to know more	Very positive, want to participate
EA	Attitude change	No change, remained the same	Slight change	Somewhat changed, want to study more	Totally changed, admitting huge change
EK	Previous knowledge and/or experience in entrepreneurship	No, nothing	Limited, have seen parents, relatives	Short experience, courses, have some knowledge	Active entrepreneur, finished business school
EM1 EM2	Emotions, feelings before (1) the course and after (2)	Negative, afraid, scared, not for me, etc.	Indifferent, so-so, mandatory	Positive, somewhat interested in subject	Happy to have the course, very interested
EM	Change of emotions, feelings	No change, all the same	Slight improvement	Mainly positive, some feeling of difficulty or boredom	Entirely changed in a positive way
MO1 MO2	Motivation for entrepreneurship course before (1) and after (2)	No motivation, just pass the course, get points	Not really, but want to get good grades	Motivated, it might be useful in the future	Very motivated, want to learn about entrepreneurship
MO	Motivation change	No change	Some positive change, interest	Big change, useful and interesting	Radical change, want to study more, take more courses
P	Participation	Few times	So-so	Most times, rather active	All times, active participation
DI	Difficulty perceived	Very easy	Rather easy, not very difficult	Difficult enough	Very difficult
IT	Interest	No interest	Tentative, so-so	Mostly interesting	Very interesting, liked it all
IN	Intention to start business	No intention	Tentative, maybe in future	I would give a try if…	Clear intention, decided
MC	Metacognitive expressions	No expressions	Few expressions	Some expressions	Showing great awareness
MN	Metaconative expressions	No expressions	Few expressions	Some expressions	Showing great awareness
MA	Meta-affective expressions	No expressions	Few expressions	Some expressions	Showing great awareness

Table AII.
Coding framework

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Curriculum vitae

Personal data

Name: Sirje Ustav

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Education

2011–2018 Tallinn University of Technology – PhD

2008–2011 Estonian Business School – MSC

2009–2014 Tallinn University(Psy) – BSC

2004–2007 Estonian Business School – BSC

1973–1984 Sikupilli – High school

Language competence

Estonian – native

English – fluent

Russian – fluent

Finnish – average

German – basic

Professional employment

2013– … Tallinn University of Technology, Lecturer

2012–2013 Tallinn University of Technology, Specialist

2008–2012 Enterprise Estonia, Development Consultant

2002–2004 Profox Trade AS, CEO

1999–2000 JD International, CEO

1997–1999 JD International, Marketing Manager

1994–1997 ABE International, Marketing Manager

1989–1994 ETK, Purchasing Manager

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Hariduskäik

2011–2018 Tallinna Tehnikaülikool – PhD

2008–2011 Estonian Business School – MSC

2009–2014 Tallinna Ülikool – BSC

2004–2007 Estonian Business School – BSC

1973–1984 Tallinna Sikupilli Keskkool – Keskharidus

Keelteoskus

Eesti keel – emakeel

Inglise keel – Kõrgtase

Vene keel – kõrgtase

Soome keel – kesktase

Saksa keel – algtase

Teenistuskäik

2013– … Tallinna Tehnikaülikool, Lektor

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1999–2000 JD International, Tegevjuht

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