Metacognition, Learning, & Socrates: Asking Questions to Foster Entrepreneurial Minds

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ABSTRACT

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Abstract

Scholars have criticized the field of entrepreneurship education for ignoring cognitions relevant to the discipline in the past and focusing on traditional pedagogies when teaching it. To fill both gaps, an educational intervention was conducted with the purpose of increasing high school students' metacognition - which forms the foundation of an entrepreneurial mindset. The Socratic Method (SM) was chosen as the method of instruction, which is a constructivist pedagogical approach built on stimulating critical thinking and dialogue. The sample included 15 students with a mean age of 16.6. The intervention was conducted by me, took place in a language school in Russia, and lasted for three consecutive days. Mixed methods were applied to collect and analyse data. For the quantitative part, self-reported pre and post measurements of student metacognition were obtained using the measure of adaptive cognition (MAC), followed by a paired-sample t-test. On average, students' metacognition had moderately increased after the course as measured by the five variables of the MAC, with changes in goal orientation not being statistically significant. The effect size of the intervention was strong, indicating that the increases as measured by the MAC were caused by the intervention itself. To understand the ways in which the SM contributed to the increase in student metacognition, qualitative data was collected in the form of students' learning diaries, resulting in triangulation. The qualitative findings highlighted several specific mechanisms in which the SM contributes to students' metacognition, those being consistent with the constructivist ideology. There seems to be potential in utilizing constructivist pedagogies within entrepreneurial classrooms to foster metacognition, however further research is needed that will include larger samples and control groups to push for generalizability and superiority over traditional pedagogies. In addition, attention was brought to whether it is better to measure metacognition quantitatively or assess it qualitatively. The study's contribution resides within its piloting nature where the SM is used to increase metacognition within an entrepreneurial classroom, thus trying to bridge the two gaps mentioned in the beginning of this abstract.

Key words
Metacognition; Entrepreneurial Mindset; Entrepreneurship Education; Constructivism; Socratic Method; Case Study; Triangulation; Mixed Methods; MAC; Learning Diaries

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The time of submitting this thesis is indeed one to remember. As of May 2020, the whole world has and is still experiencing a rather unique situation amidst the outbreak of the Covid-19 pandemic. It is the reason why a handful of the planet's population has been ordered to isolate themselves and stay at home to prevent the spread of the virus. Without doubt, isolating ourselves is making us to re-evaluate our lives and learn to appreciate a handful of things that we are taking for granted, starting from being able to simply go outdoors, and ending with travelling abroad for a vacation or submitting a thesis.. I find great privilege in being able to submit my work comfortably from my home while others around the world are experiencing far challenging times. And naturally, I feel the need to express my gratitude to the people that have helped me, because as much as this thesis bares my name as the author, there are those without whom this would be impossible.

First, a major salute to my supervisors - Dr. Juha Kansikas for being very supportive of my research topic straight from the beginning, as well as Associate Professor Mikko Rönkkö, whose critical insights made me improve my study significantly. I believe that they manage to get the best out of me and enable me to become better as a researcher, at the same time taking personal interest in my ideas and providing all the needed support. In my opinion, that is all I could ask from my supervisors.

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I would like to thank Dr. Maria Hassandra. They don't make any better than her, and it has been my family's pleasure to have her with us. Furthermore, my utmost love and respect to the students that participated in this study. It was a privilege to share the classroom with them and learn a handful of things. As for my family… We will talk about them more on the acknowledgement page of my doctoral dissertation., however I would to thank my mother for tolerating me during my thesis-writing times, which arguably saw the best and worst of me.

CONTENTS

LIST OF TABLES AND FIGURES

1 Rationale of the Study

"The unexamined life is not worth living"

Socrates, ancient Greek philosopher

These words by Socrates perhaps abstractly reflect the history of humanity. It has been long, and it most certainly has seen its ups and downs. However, just by taking a look back in time when our ancestors were writing on walls within caves, and then reflecting on what is happening in our lives nowadays (2020 at the time of writing), we cannot help but be impressed with the advances we have achieved - fuelled by our curiosity. One could argue that these advances are indeed an outcome of humans examining and re-examining life, regardless of which ontological or epistemological stance one chooses to side with. At the end of the day, are we even capable of imagining a world where there is one single explanation that concerns all human life? I dare to argue that maybe we are not. However, even though we may never land on a single explanation, perhaps we could agree on the importance of examining and re-examining ourselves and our environments, for this has proved to provide a somewhat systematic progress of the quality of the human life. The latter arguably has its benefits, otherwise I would not be typing this thesis on Microsoft's Word, on a HP laptop, while reading about Socrates on the internet. Without inquiry, there can be no progress. Without inquiry, we might as well remain in caves, or perhaps even go extinct?

Life is not built on 'what ifs', despite their appeal. Yet, if we think about ourselves today, some 2500 years since Socrates reportedly lived, his words are more relatable than ever. We keep on examining and inquiring, no matter how 'good' or 'bad' things are, eventually coming to tangible developments that are the results of said inquiry. Following the traditions of humanity, we have scientifically formalized such inquiries and developments. More specifically, we often tend to refer to entrepreneurship whenever we want to define the cause of a new development as an outcome of innovativeness and creativity, whereas those behind it are called entrepreneurs (Shane & Venkataraman, 2007). Given the importance that entrepreneurial individuals have had on our history with their "creative destruction" (Schumpeter, 1942, pp. 82-85), whether we consider them to be founders of new businesses or not, we could state that they manage to create and offer a valuable advancement of the existing status-quo (Campbell, 2011), which would theoretically and practically represent an advancement of the existing pool of knowledge (Somaya & Williamson, 2011). In turn, given the theoretically sound and empirically verified benefit of entrepreneurial activity, it seems rational for the field of entrepreneurship research to take a closer look at the cognitions of said entrepreneurial individuals (Krueger, 2003), as this stream might be

able to tell us what is happening behind the scenes of entrepreneurial activity. Consequently, if we manage to structurally decode entrepreneurial cognitions, then we can channel our efforts towards enhancing them via educational routes (Ford, 2006). There is appeal in fostering entrepreneurial minds, as we may arrive at what is called an "entrepreneurial society" (Audretsch, 2009, p. 253) – a society defined by constant innovations and increased prosperity, led by no others than humans and the increased amounts of knowledge that they generate as an outcome of their creativity. Thus, the purpose of this thesis is to investigate entrepreneurship through the lenses of cognitive psychology and learning. More specifically, it is argued that through metacognition, which is a cognitive skill involving one´s knowledge of their cognitions, as well as the capacity to regulate them (Flavell, 1979), individuals are capable of mastering a deeper understanding of what they know and do not, and based on that, generate new knowledge by identifying potential avenues for applying their creativity (Mitchell, Smith, Gustafsson, Davidsson, & Mitchell, 2005; Schraw & Denisson, 1994; Armbruster, 1989).

In the past, both the field of entrepreneurship, as well as the way we teach it has been criticized for granting little importance on the cognitions of the individuals despite their significance, as the focus has been more on the technical skills required for, such as writing a business plan or preparing financial forecasts (Mitchell, Smith, Gustafsson, Davidsson, & Mitchell, 2002; Schindehutte, Morris, & Allen, 2006; Chen, Greene, & Crick, 1998). Consequently, scholars have been calling for changes within entrepreneurial classrooms, where an emphasis is made on developing the necessary cognitive skills that relate to entrepreneurship (Béchard & Grégorie, 2005; Nabi, Liñán, Fayolle, Krueger, & Walmsley, 2017; Neck & Greene, 2011). Respectively, as creativity is fuelled by metacognition (de Acedo Lizaragga & de Acedo Baquedano, 2013), it should be no surprise that it also seems to be a defining element when discussing the entrepreneurial mindset – one that enables individuals to deal with highly dynamic and uncertain environments that require continuous innovation (Haynie, Shepherd, Mosakowski, & Earley, 2010). Because metacognition seems to be gaining significant weight in the discussion about entrepreneurship, we must consider the educational implications that such a scenario bares. Metacognition can be taught (Ford, 2006), and some researchers (Venesaar, Ling, & Voolaid, 2011) advise entrepreneurship pedagogues to include the development of students' metacognition when planning their curricula, if not building the assessment of entrepreneurship courses around it. Therefore, this thesis concerns an educational intervention that has been developed and conducted with the purpose of increasing student metacognition within the context of entrepreneurship education.

In the past, entrepreneurship pedagogues have been focusing on out-of-date teaching practices that do not consider a key element of entrepreneurship – the individual (Meyer, 2011). Therefore, before deciding on how to approach the in-

tervention from the learning point of view, three major learning theories (behaviorism, cognitivism, constructivism) are reviewed (Ertmer & Newby, 2013). The review is narrowed to these three theories because prior to the emergence of constructivism, learning theories were in general assumed to belong either to the behaviorist or cognitivist paradigm (Hilgard & Bower, 1966). However, with the rise of constructivism, a third category has emerged (Ertmer et al., 2013). The idea of reviewing the theories is to address their implications for instruction when its aims is to increase metacognition within an entrepreneurial classroom. For that, the very nature of metacognition has to be taken into consideration, and in addition, for the purpose of avoiding the isolation of the learning theories from the entrepreneurial context, at the same time as the theories are reviewed, they are paralleled with literature on entrepreneurial opportunities - one of the main interests in entrepreneurship research (Short, Ketchen, Shook & Ireland, 2010). Research on opportunities claims that individuals can either recognize, discover, or create an opportunity that will trigger the entrepreneurial venture (Sarasvathy, Dew, Velamuri, & Venkataraman, 2003). Respectively, each opportunity type has a lot in common with one of the three theories, as the review in the next chapter will demonstrate. This is done for the purpose of deciding at a conceptual level which theory better serves the task of enhancing metacognition within an entrepreneurial context. After rejecting behaviorism and underlining the insufficiency of cognitivism for explaining entrepreneurial uniqueness (Sahut & Peris-Ortiz, 2014; Suddaby, Bruton, & Si, 2015), I have chosen to approach the intervention from a constructivist lens.

Consequently, since metacognition is in close interplay with critical thinking (Duhn, 1999), I have chosen as the pedagogical method of Socrates. He is, after all, considered as the 'father' of critical thinking in western philosophy (Hoaglund, 1993). The method represents such a classroom setup that is built on asking questions from the students and stimulating dialogue, rather than having the teacher deliver all the content through instruction. The purpose of such an active dialogue is to provoke students' critical thinking, while at the same time they are guided towards the answers, instead of the answers being given to them, which is what traditional education stands for (Ross, 2003). In addition, as will be explained later (2.7.2), Socratean elements are advised for entrepreneurship education across a range of aspects, including for example dialogue-based education, stimulation of critical and reflective thinking, and increased student activity. Having chosen the Socratic Method, I implemented an educational intervention in the form of an intensive course that lasted for three consecutive days with the purpose of increasing students' metacognition, while the course contents were of entrepreneurial nature. This leads to the following research question that narrows the scope of the thesis:

How and why does the Socratic Method contribute to the development of student metacognition within the context of entrepreneurship education?

Following chapter 2 where the literature review is presented, the methodology chapter details the empirical part which involves a case study combined with a mixed methods approach – one concerning a quantitative measure of metacognition, and one concerning the qualitative understanding of how the Socratic Method contributes to its increase . The results are then presented and discussed with regards to the research question posed in this introduction, including considerations of reliability and validity of the present study, leading to the overall conclusions that address the study's strengths and limitations, as well as implications for teaching and research.

2 Metacognition & Learning Theories from an Entrepreneurial Perspective

This chapter is structured as follows. First, the problematic state of entrepreneurship education is reviewed, as well as the reasons behind it. Then, with the help of Bloom's Taxonomy, a tool widely used in educational sciences for understanding learning, teaching, and assessing (Anderson et al., 2001, p. XXI, more in 2.2), metacognition is introduced, followed by literature that covers what is known so far about its interplay with the domain of entrepreneurship. Then, the three learning theories (behaviorism, cognitivism, constructivism) are reviewed in parallel with the three types of entrepreneurial opportunities (recognition, discovery, creation), followed by their implications for instructing metacognition within an entrepreneurial classroom when compared to each other. Given constructivism's suitability for the presented task when weighted against its counterparts, the review proceeds to explaining the Socratic Method – a constructivist pedagogical approach based on dialogue (more in 2.7). A pre-conceptual summary follows before the text proceeds to the methodology chapter.

2.1 Entrepreneurship Education: Calling for Change

Given the importance of entrepreneurship in today's world, it is logical to put an emphasis on fostering more entrepreneurs through educational means (Peterman & Kennedy, 2003). However, this may be harder to achieve than to wish for. The nature of entrepreneurship makes it hard to build a fixed educational approach around it, because entrepreneurship is a very dynamic field that is connected to the distinct thoughts and actions of human beings (Kent, 1990, pp. 1-3). However, even though each venture is unique, it is important to look for and question the commonalities among entrepreneurs (Schindehutte, Morris, & Allen, 2006). Yet, finding these commonalities does not guarantee that they can be taught. Literature on entrepreneurship education (hereafter EE) shows that insofar it has failed to yield the desirable results with regards to generating more entrepreneurs, while at the same time it needs further development both at the theoretical and methodological levels (Fayolle, 2013; Pittaway & Cope, 2007; Nabi et al., 2017; Béchard & Grégoire, 2005).

One problem that has been addressed is that entrepreneurship research has distanced itself from the very key element of it – the individual. Numerous scholars (Schindehutte et al., 2006; Baron, 2008; Cardon et al., 2008; Nabi et al., 2017) report that despite their significance with regards to entrepreneurial ventures, the feelings, thoughts, and experiences of the individuals that engage in them have been ignored. While entrepreneurship as a field has matured, what we teach is not

fully legitimate (Katz, 2008). Entrepreneurship research and pedagogy are stalled because academics focus on outdated approaches to both scientific inquiry and teaching (Meyer, 2011). This then might explain the reason why Edelman, Manolova, & Brush (2008) found that entrepreneurship textbooks and actual start-up activities have more differences than similarities, concluding that what is taught via EE may not be what entrepreneurs do, and this just adds to the long list of critique that EE has faced over the years.

Kuratko (2005) recommends educators to behave like students when teaching entrepreneurship - that is, the same entrepreneurial qualities that are being taught to students must be used by the educators. A pedagogue that does not embrace the very nature of entrepreneurship may not me the most suitable person to teach it. Entrepreneurship classrooms should consider the inclusion of justice and equity, constructivism (more in 2.5), humor and role-play (Huq & Gilbert, 2017). Meanwhile, Ling & Venesaar (2015) argue that traditional lecturing that is based on memorizing things is not suitable. Instead, they suggest such techniques that focus on creative and independent learning, in addition to explaining to the students the "meaning of the content" (p. 340) that is being taught to them. In addition, Genson (1992) advocates for the inclusion of non-business contents into entrepreneurship curricula, such as psychology and philosophy, as there is a great deal that can be learnt from them and then applied in the entrepreneurial context. The meta-analytic review of Bae, Qian, Miao, & Fiet (2014) on the correlation between students exposed to EE and entrepreneurial intentions showed a positive yet of little significance result, despite entrepreneurship programmes claiming the opposite. Therefore, although the purpose of EE would seem to be the generation of entrepreneurs, it seems that it had failed to do so in its majority.

The general problem stemming from this criticism is that much of EE is focused on teaching the technical and somewhat objective aspects of the discipline based on traditional pedagogies (such as making a business plan or profitability calculations), yet those tactics don't seem to achieve the purpose of practically generating more entrepreneurs out of students (Bae etl al., 2014). At the same time, attention has been brought to including cognitive training within entrepreneurship curricula (Nabi et al., 2017; Neck et al., 2011; Venesaar et al., 2011), which focuses on the individual as a learner (and potentially an entrepreneur). In turn, what if EE placed an emphasis on facilitating the entrepreneurial minds of students, rather than focusing solely on technical matters? In the end, why or even how would a person consider or engage in entrepreneurship without the presence of the required entrepreneurial mindset?

Because said mindset seems to be of metacognitive nature (Haynie et al., 2010), and metacognition can be taught (Ford, 2006) the following parts introduce metacognition and its definition with the help of Bloom's Taxonomy (Kratwohl, 2002), in addition to presenting the various benefits it brings within the context of entrepreneurship, while at the same time becoming the focus of the distinctive

field of the study of entrepreneurial cognition, which aims to answer the question posed by Mitchell, Busenitz, Bird, Caglio, McMullen, Morse, & Smith (2007, p. 2) – "How do entrepreneurs think?".

2.2 Bloom's Taxonomy & Metacognition

In 1956, Benjamin Bloom and his colleagues provided a classification of educational objectives in an attempt to assess the cognitive functions of learning (Karnes & Nugent, 2004, p. 18). Bloom wanted to understand how students think when exposed to instruction (Karnes & Nugent, p. 17). The classification consisted of six cognitive objectives: knowledge, comprehension, application, analysis, synthesis, and evaluation, and is commonly known as "Bloom's Taxonomy" (hereafter 'BT') (Woolfolk, 1990, p. 435). Later in 2001, BT was revised, resulting into a modification of the original taxonomy. More specifically, the six cognitive objectives had become the six cognitive processes, supplemented by four knowledge dimensions: factual knowledge, conceptual knowledge, procedural knowledge, and metacognitive knowledge (Kratwohl, 2002). The original taxonomy, as well as its revision, are depicted in figure 1 below:

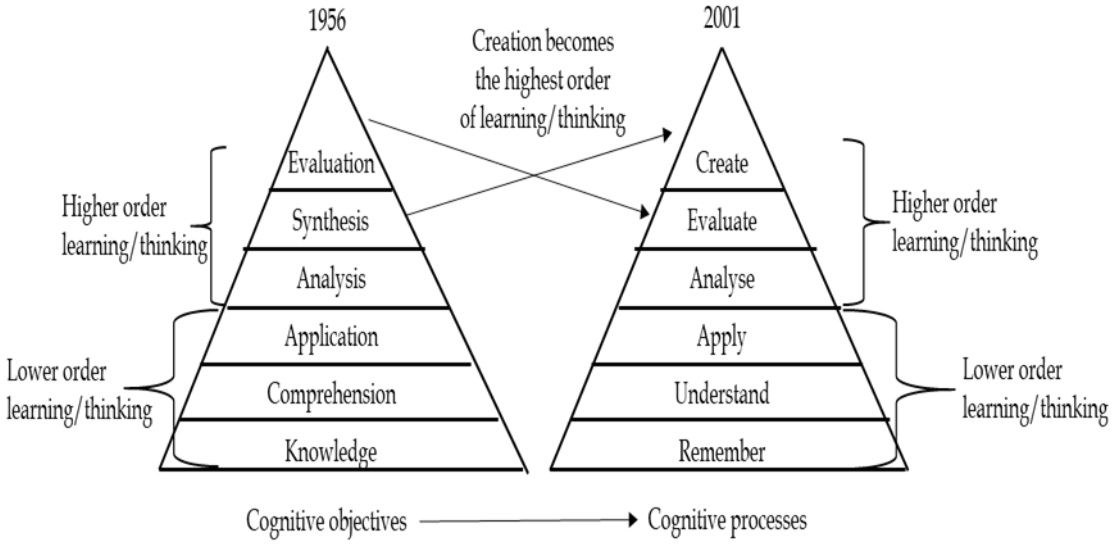

Figure 1. Bloom's Taxonomy: Original and Revised Models

The first three levels are thought to be lower order thinking skills that dictate one's learning, meaning that a person advances her/his learning as the person is progressing higher in the taxonomy. The last three represent the higher order thinking skills, with creation being considered the final stage of one's learning. Applying what has been remembered and understood signals the achievement of the lowest orders of learning which can be achieved via traditional instruction methods (Kratwohl, 2002). The lower levels represent human cognition where

mental actions result in the acquisition of knowledge through converting sensory inputs into something that can be understood and applied.

How do we define then the next three levels? What happens when our cognition goes beyond the application of knowledge? The answer is metacognition, a term that was advanced by Flavell (1979), and exploits one's inquiry into their own cognition, hence the word 'meta' which translates from Greek as 'beyond'. The term is also known as "thinking about thinking" (Paul, 1990, p. 32), and two components of metacognition are an individual's understanding of why they have formed certain cognitions, as well as how to alter and navigate them (Mitchell et al., 2005). Another explanation is provided by Schraw & Dennison (1994), who explain it as one's ability to control, understand, and reflect on their learning. Note that those components resemble in much analysis and evaluation as expressed in BT, whereas those two are commonly understood to signal critical thinking (Mulnix, 2012). This then justifies the interplay between metacognition and critical thinking (Duhn, 1999). People utilizing metacognitive strategies are analyzing and evaluating their own pool of knowledge by monitoring their own process of learning. Metacognition is influenced by the learner's decree of metacognitive awareness, the presented task and the learner's understanding of how difficult the task is, and finally the strategic approach that the learner will choose in dealing with the task (Duell, 1986; Flavell & Wellman, 1977). Individuals possessing metacognitive capabilities will deal with a task differently than the ones who do not. An individual that does not employ metacognition most likely will just start dealing with a task that is presented. However, a person employing metacognition will first identify what the task is, as well as the possible ways to approach it, after which the person will engage in dealing with the task while at same time reflecting on whether the chosen approach is actually helping towards fulfilling the task (Baker & Brown, 1984). Finally, once the task is concluded, the individual will reflect on how the task was dealt with to figure out whether a more effective solution to the task could have been implemented.

Metacognition is a cognitive skill that can be facilitated via educational means, and there is great appeal in doing so (Ford, 2006), since it improves achievement in numerous disciplines. However, students often are not even aware of metacognition (Schunk, 2012, p. 289), and rarely does the educational setting offer the chance to develop it, as most of our traditional education does not aim at getting students beyond the application stage of BT in terms of learning (Kratwohl, 2002). Metacognition enables people to validate their own thinking, making it important to practice it in the classrooms in such ways that students can understand its value and utilize it in the future (Kakouris, 2015; Kuhn, 1999). It is not a synonym of critical thinking, because one can be critical towards things in general (i.e. analyzing and evaluating something external), but metacognition is about being critical towards one's process of learning. People engaging in metacognition are being critical towards themselves with the purpose of re-examining their assumptions concerning their own learning process. The knowledge dimensions

help in understanding how individuals progress through the taxonomy based on the possessed knowledge. It is important to note that the first three knowledge dimensions were present in the original taxonomy as well, therefore, it was the metacognitive dimension that was added. According to Kratwohl (2002), metacognition could not be in the original model as the concept was not yet popularized in 1952 when the taxonomy was originally published. The dimensions and their explanations are presented in the table below:

Table 1. Knowledge Dimensions in Bloom's Taxonomy

Knowledge Dimension	**Explanation**
Factual	Knowledge about facts (for example a date when an event took place, or knowing how the letter 'a' looks)
Conceptual	Knowledge of facts pieced together to form a bigger structure (for example theories, geographical areas, laws)
Procedural	Knowledge of applicability of the possessed conceptual knowledge (for example conducting research, playing basketball, filming a video)
Metacognitive	Conscious understanding of one's thinking process and possessed knowledge when engaged with a task, as well as the conscious choice of the most suitable strategy in dealing with a task, followed by its monitoring and evaluation

The first three dimensions can be linked to the lowest parts of the taxonomy, where the learner remembers the facts, understands wider concepts, and can apply them into procedures. In turn, the metacognitive knowledge dimension relates more to the highest order of thinking that enables deep learning. When the metacognitive dimension is accessed, an individual will analyse what is known and what is not, evaluate the task at hand, and eventually proceed with creating the most suitable strategy while at the same time it will be monitored.

An illustrative example of metacognition is the check-in that is required before any flight. Given the advances in technology, many companies offer the chance to check-in in advance using various online services, and by that they significantly reduce the amount of waiting time in queues at the airports. The following self-dialogue is a demonstration of metacognition, assuming that the imaginary passenger in concern has to check-in a piece of luggage as well:

- My task is to check-in

- Unless I check-in, I will not be permitted to board the plane. I know that because I have done this before
- What are my options for checking-in?
- I can either do it remotely and proceed directly to the automated baggage drop counter at the airport and then following that proceed to the security check. Under such circumstances, I would need to be at the airport approximately an hour before departure.
- On the other hand, I could check-in at the airport counter, but there is a possibility I would have to wait in the line, meaning I have to be at the airport minimum two hours in advance.
- Based on that, I will choose the first option.

This is a very simple example of employing metacognition, where a person presented with the task of checking-in remembers the concept of check-in, understands its procedure, is able to apply it in a real-life context, and following its analysis, evaluates the task and consequently creates the best possible strategy for dealing with it. However, as already pointed earlier in this sub-chapter, often people are not even aware of employing metacognitive strategies (Schunk, 2012, p. 289), which respectively diminishes the likelihood of employing them in the future. It is hard imagining someone using systematically a skill that they are unaware of possessing. Metacognition has been getting increasing attention, and scholars advise towards its facilitation in educational setups together with creativity (Sahlberg, 2010; Tanner, 2012).

In order to enable the creativity of individuals, as can be seen from the BT, one must first go through analysis and evaluation, and those are metacognitive in nature. In addition, metacognition has been directly linked to the creative potential of an individual, meaning that a person with higher metacognitive capabilities has a better chance at being creative (de Acedo Lizarraga et al., 2013), and that is why metacognition's role in entrepreneurship is of highlighted importance, as creativity is considered to be the central element of entrepreneurship (Campbell, 2011). Consequently, entrepreneurship educators should be particularly interested in including the development of metacognition within their classrooms, if not making it one of the cornerstones of their curricula (Venesaar et al., 2011). And while creativity could be considered as the transparent reason to consider metacognition within entrepreneurship classrooms, there are several others, which are presented in the following sub-chapter.

2.2.1 Metacognition's Role in Entrepreneurship

In 2010, Haynie et al. (2010) argued that the mindset of entrepreneurs is metacognitive in nature, with the starting point being one's understanding of their motivations, as well as the inquiry into the opportunities provided by the external environment. Later, Haynie, Shepherd, & Patzelt (2012) demonstrated that metacognition may compensate for the lack of entrepreneurial expertise. That is,

even if individuals do not have prior experience in entrepreneurship, they can still exert entrepreneurial behavior and decision-making via the employment of metacognitive strategies. Metacognition helps individuals to figure out what they know, or do not, and how to utilize this knowledge when pursuing a venture (Nambisan & Baron, 2013). The latter scenario could be labeled as a synonym of Sarasvathy's effectuation theory (2001), where she explains that the main difference in dealing with a task between entrepreneurial and non-entrepreneurial individuals is that the former start by asking questions about themselves, and then based on that they form a goal (effectual approach), while the latter begin with setting a goal and then trying to find the means to achieve it (causal approach). This interconnection between metacognition and effectuation might be able to explain why entrepreneurs experience lower levels of stress (Baron, Franklin, & Hmieleski, 2016). If metacognition leads to the application of the effectual approach, then it's possible that entrepreneurs have a rather clear picture and understanding of why and what they are doing, and so tend not to stress. Instead, they tend to have confidence in themselves and tolerate risks easier than others (Barbosa, Gerhardt, & Kickul, 2007). In addition, since metacognition involves self-feedback, it enables individuals to adapt their cognitions, which makes them flexible when dealing with dynamic and uncertain environments (Haynie & Shepherd, 2007).

The link between metacognition and various aspects of entrepreneurship is evident throughout recent literature. There is a positive, chain relationship between metacognition, entrepreneurial orientation, and firm performance (Cho & Jung, 2014; Mukherji, Mukherji, & Hurtado, 2011). That is, a firm comprising of metacognitively aware individuals is more likely to be inclined towards entrepreneurship which eventually will improve the firm's performance. Furthermore, in an inquiry to assess the intuition of entrepreneurs, which they love to quote occasionally as the reason behind the success of their ventures, Blume & Covin (2011) argue that in fact, even though entrepreneurs call it intuition, the actual processes leading them to be intuitive are metacognitive in nature. Knowing what you know can assist entrepreneurial individuals in setting realistic goals that can be achieved, rather than setting way too ambitious ones that eventually demotivate a person and result into failure (Baron, Mueller, & Wolfe, 2016). Furthermore, metacognition can have a positive effect on a firm's survivability (Nambisan et al., 2013; Urban, 2012a; Haynie et al., 2007), as individuals will constantly monitor the firm's performance and be alert for potential changes that would require flexible action.

The importance of metacognition within the domain of entrepreneurship becomes clearer as research on it progresses, as it can tell us why entrepreneurial individuals think differently and how they do it, according to Baron (2014). Respectively, there is already support and evidence for the integration of metacognition into entrepreneurship curricula. Metacognitive knowledge can have a predictive power on the entrepreneurial intentions of individuals, and so it would

be useful for entrepreneurship pedagogues to develop practices that aim at enhancing metacognition (Urban, 2012b). This view is consistent across researchers from various countries. Mitchell, Bailey, & Mitchell (2008) claim that enhancing the entrepreneurial thinking in students equals to the enhancement of their metacognitive abilities, while Ling et al. (2015) call entrepreneurship educators to design such courses that aim at helping students develop their metacognition and self-regulation, a view consistent with Bryant (2006). For that, Ling et al. (2015) add, teaching methods will have to be revised, as traditional teaching methods may not be suitable. In addition, given the evidence proving that increased metacognitive activity from students results into better learning outcomes across a range of disciplines (Tobias & Everson, 2002), Ford (2006) concludes that fostering metacognition for students is clearly appealing. Lastly, Pihie, Bagheri, & Sani (2013) advise educators to explain to students what metacognition is, and then consequently attempt to enhance it, as this would allow them to gain and appropriate entrepreneurial knowledge and skills in the future easier. This is consistent with Schunk (2012, p. 289) who underlines the importance of explaining metacognition to the students, as most of the times they are not aware of employing it.

Metacognition has received increased attention from entrepreneurship scholars around the world (Ling, Kyrö, & Venesaar, 2013). Its importance in education, regardless of entrepreneurship, has been voiced by education scholars as well (Sahlberg, 2010; Tanner, 2012;). Such is the importance of metacognition in the entrepreneurial context that Venesaar and colleagues (2011) propose entrepreneurship programmes in universities to be assessed based on changes in students' metacognitive awareness, however with the help of appropriate instruments that can measure metacognition. Another interesting argument is made by Shavinina (2008), who believes that metacognitions speaks of the entrepreneurial gift, postulating that children that demonstrate higher metacognitive capabilities are more likely to become entrepreneurs in the future.

Conceptually, there is enough evidence on the role that metacognition plays within the entrepreneurial context, which in turn justifies its inclusion into entrepreneurship curricula. However, given that EE has ignored cognitions in the past by mainly focusing on teaching technical skills (without promising results) through traditional methods of education (see 2.1), careful consideration must be given to the learning theory that the intervention with a focus on increasing metacognition within the context of entrepreneurship will adhere to. This review so far has outlined several important aspects that concern both metacognition as a cognitive skill, as well as entrepreneurship as a discipline. More specifically, the interplay between metacognition and critical thinking (Kuhn, 1999; Ford, 2006), the central role that creativity plays within the domain of entrepreneurship (Campbell, 2011; Shane et al., 2007), and the positive relationship between metacognition and creative potential (de Acedo Lizarraga et al., 2013; Armbruster, 1989).

Therefore, two components become transparent when considering the learning paradigm for the intervention: encouragement of critical thinking within the classroom (to develop metacognition) and room for creativity (to apply metacognition) – both being of cognitive nature (Krathowl, 2002). In turn, the choice of the learning theory tells a lot about how the intervention will be conducted. The next part of the thesis reviews the three theories presented in the introduction chapter, but in order to avoid their isolation from the entrepreneurial context (since a learning theory is not bound to a certain discipline), each of the three is reflected upon entrepreneurship by bringing into the discussion literature on entrepreneurial opportunities, one of the widely researched topics withing entrepreneurship research (Sarasvathy et al., 2003; Davidsson, 2017). Following that, the implications for instruction of all three are addressed when weighted against the components mentioned earlier that relate to the goal of the intervention – increasing student metacognition within an entrepreneurial context.

2.3 Learning as a Function of Behavior

2.3.1 Main Assumptions

The birth of behaviorism is believed to have taken place in 1913, and it is John B. Watson who has received the credit for it (Skinner, 2011, pp. 5-6). It was the dominant theory surrounding learning in the first half of the 20th century, with the main dogma being that human learning occurs and consequently can be explained by observing a human's reaction when exposed to certain conditions within her/his environment. Behaviorism assumes that learning is governed by factors external to humans, while their role becomes secondary and passive (Schunk, 2012, p.72). The basic assumption of behaviorism is that a person will be exposed to a certain event (stimuli) that will cause a reaction (response). Such was the principle as laid by Watson, which can be also illustrated in the following way:

Figure 2. The Basic Assumption of Behaviorism

This model can be explained with a very simple and practical classroom example. During my master's studies, all mandatory courses had an attendance policy stating that a student must attend 80% of the lectures. Under normal circumstances, students of that degree programme are likely to respond to this stimulus by attending the required number of lectures. Following this very simple S → R relationship, behaviorism was further enriched by numerous studies. Notable scholars that have contributed to behaviorism are Thorndike with his connectionism

theory (Hilgard, 1948, p. 19), Pavlov with his classical conditioning theory involving the well-known, or in modern slang viral experiment called "Pavlov's Dog" (1928, pp. 47-75), Guthrie with his explanation of associative strength between stimulus and response (Schunk, 2012, p. 84), and lastly Skinner and his theory of operant conditioning (1938, pp. 19-20). Each one of them have contributed to the field in different ways.

Thorndike claimed that a positive consequence of a response is likely to strengthen the occurrence of that response when presented again with the same stimuli (Tolman, 1936). In the attendance example given earlier, the consequence of attending the classes is the non-downgrading of the course grade. Downgrading was not mentioned earlier when introducing behaviorism, since the original assumptions about behaviorism made by Watson concerned only stimuli and response (Moore, 2011). Pavlov was able to demonstrate how an originally neutral stimuli (ringing the bell, using a metronome, turning a bulb on) could become conditioned to provoke the desired response (saliva) when paired with other stimuli (food). In turn, Guthrie claimed that the strength between a stimulus and a response is based on the first occurrence of such a relationship and that most likely a person presented with the same stimulus will react similarly as during the first time (1952, p. 23). Lastly, Skinner is responsible for the theory of operant conditioning, which can also be termed as 'A-B-C', where A stands for the discriminative stimulus, B stands for the response, and C stands for the consequence of the response (Schunk, 2012, p. 114). Skinner's model is illustrated in Figure 2.

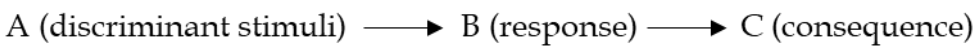

Figure 3. Skinner's Behaviorism Model

Consequences that are deemed reinforceable (desired) by an individual will increase the likelihood of the same response that caused them when presented once more with the same stimuli, whereas consequences that resulted into punishment will decrease the use of response that provoked the punishment. Another simple example can be given from the classroom. Assume two students must tell a poem by heart (A). One does it extremely well (B) and receives praise (C), whereas the second student performs poorly (B) and receives negative feedback (C). Judging from this, it is fair to assume that both students will choose to perform well next time they are given such a task, or at least try, since they have experienced both the positive consequence of doing that, as well as the negative one from not performing well. Thus, the response that triggered a positive consequence is likely to be reinforced, whereas the one that did not will be discarded.

From an instructional point of view, behaviorism sees the learner as being reactive and passive, while at the same time it is assumed that the required behaviors can be systematically shaped by the instructor (Ertmer & Newby, 2013; Morse &

Kelleher, 1977). The empirical foundations of behaviorism lie within the observable and measurable performances of a human beings, as well as the form and frequency in which they occur. In addition, reality is perceived as being objective and external to the individual. However, it is the very simplicity with which behaviorism explains learning that lead to a wave of criticism by cognitivists. Prior to moving on to the review of cognitivism, the critique of behaviorism is presented with the help of opportunity recognition, which as the following subchapter (2.3.2) will show, borrows a lot from behaviorist principles.

2.3.2 Raised Concerns & Opportunity Recognition

The popularity of behaviorism began deteriorating roughly in the beginning of the second half of the 20th century, with the main reason being that it had ignored mental processes and cognitions of learners (Winn, 1990). This is not surprising, because behaviorism argues that learning is governed by external forces (the environment) rather than the human. Furthermore, behaviorism has received a fair share of criticism for basing its empirical methodology on experiments conducted with either animals, or in one-on-one situations with humans (Bandura & Walters, 1963, p. 1). In the world of today, it would be probably unacceptable to not consider people's thoughts, belief systems and feelings when trying to explain their learning, especially when taking into account the increasing popularity of the humanism approach that places the uniqueness of each individual at the centre of the learning process, if not life in general (Guey, Cheng, & Shibata, 2010). Humanism is deliberately left out from this review as it is more of a philosophical and ethical stance rather than a learning theory.

Behaviorism can be put into an entrepreneurial perspective when reflecting on it via the lens of opportunity recognition. When we talk about opportunity recognition, we assume that entrepreneurial opportunities exist within a market and emit signals to individuals, who then decide to act upon them or not (Covin & Miles, 1999). Said markets are thought to be of objective nature (similar to how behaviorism treats reality) where the forces of supply and demand are in equilibrium (Sarasvathy et al., 2003). This mirrors back to behaviorism, where a stimulus (opportunity) triggers a response (recognizing it) that leads to a consequence (acting on it). Thus, in such a behaviorist scenario, the act of entrepreneurship is governed by an external factor, which is no other than the market, and the entrepreneur is seen solely as a passive learner that reacts to presented opportunities that reside within the objective world.

However, back in 2002, Mitchell, Busenitz, Lant, McDougall, Morse, & Smith raised an issue related to entrepreneurship research at the time. According to the authors, the field had failed to answer the questions of why and how entrepreneurs think. Instead, it was assumed that some individuals are unique by nature and possess a certain set of traits that enable them to be entrepreneurs. Given the dissatisfaction of the authors, they called researchers to approach entrepreneurs

from the lens of cognitive theory, in order to be able to answer the questions related to their thinking. Earlier in 1996, Busenitz & Lau also stressed the importance of understanding what is happening within the minds of entrepreneurs. After all, it takes a great deal of cognitive effort to engage in entrepreneurship, otherwise hypothetically anyone could do it by simply practicing opportunity recognition and other entrepreneurial behaviors, or at least that would be the behaviorist perspective. Note how the critique towards behaviorism as a theory of learning (Winn, 1990) mirrors the critique raised towards explaining entrepreneurial activity (Mithcell et al., 2002). Critics of each claim that individual cognitions are equally important when explaining human learning or entrepreneurs, while in addition reality is not objective and not all information is available at once to all people, as behaviorism and opportunity recognition theories would claim. Therefore, building an entrepreneurial classroom that aims at increasing metacognition on the principle of behaviorism gives an at least incomplete picture, and evidence from the fields of entrepreneurship and EE provide further support to this argument.

Entrepreneurship researchers have criticized the field for granting little importance to what entrepreneurs feel, think, and experience during their ventures despite their significance (Schindehutte et al., 2006; Baron, 2008; Cardon, Wincent, Singh, & Drnovsek, 2008; Nabi et al., 2017). Neither does behaviorism consider those as important for learning, because individuals are assumed to be passive and only responding to presented stimuli. In addition, although behaviorists would claim that opportunity recognition can be conditioned, they would not be able to explain the diversity of the presented opportunities and why certain individuals choose to exploit one over the other. For example, in social entrepreneurship, which is a type of an entrepreneurial venture that aims primarily at addressing a problem within the society and offering a solution to it (Shapero & Sokol, 1982), opportunities are approached from a difference lens, as they differ from the ones related to commercial entrepreneurship (Lehner & Kansikas, 2012). The reason for that is that social entrepreneurs do not have profit making as a priority, but rather the positive contribution that their venture will have on the society. That is why many social entrepreneurs are satisfied when operating at cost, or, when making profit, tend to reinvest that money rather than paying any kinds of dividends (Petrella & Richez-Batesti, 2014). Respectively, the decision to pursue either corporate or social entrepreneurship lies within the individuals and their unique predisposition, which contradicts to the behaviorst principles that does not consider a learner's unique stance with regards to learning.

Despite the evidence presented above, most of EE has been focusing on teaching the technical aspects of entrepreneurship following the behaviorist approach to education, and the outcomes cannot be labeled as neither fruitful or promising, calling for a change in how we teach the discipline (Chen et al., 1998; Nabi et al., 2017). Indeed, a reasonable question to ask is why we have so much EE nowadays implemented in various forms, yet we seem to struggle with enhancing various

attributes related to entrepreneurship, such as required skills, motivation, self-efficacy, and intentions (Bae et al., 2014; Chen et al., 1998; Oosterbeek, van Praag, & Ijsselstein, 2010). With the purpose of this study being the enhancement of metacognition within the entrepreneurial context, behaviorism does seem unsuitable for the task at hand.

First, it would be illogical to try and increase student metacognition (which is a cognitive skill) by adhering to a theory that ignores it. Second, the uniqueness of each learner is not considered, like in the theory of opportunity recognition, and those lead to the third point, that of how reality is perceived. Both behaviorism and opportunity recognition theory assume the reality to be objective and existing independently from the individual. However, if those claims were to be true, teaching entrepreneurship would be somewhat easier than it is, and we could simply condition students to recognize opportunities in the objective world or market (to put it into economic terms), yet we know from evidence that this is not the case. Lastly, because reality is perceived as being objective, there is little if any room for creativity on the learner's behalf, but this is highly contradictive with the principle of entrepreneurship – creating something new (Shane et al., 2007), whether that be an idea, venture, product, or service. On the other hand, it should not strike as a surprise that a learning theory dating to early 20th century does not seem like a good fit for teaching metacognition within EE in the 21st. In the end, the critique towards behaviorism gave rise to cognitivism (Schnaitter, 1999), whereas opportunity discovery proposes an alternative view for examining entrepreneurial opportunities (Sarasvathy et al., 2003). Both are presented in the following sub-chapter.

2.4 Learning as a Function of Cognition

2.4.1 Main Assumptions & Raised Concerns

Cognitivism emerged as a consequence of the behavioral theory and it aims at explaining people's learning through the understanding of how their brains function when interacting with their environments, which eventually lead to the formation of their behavior and decision-making (Bandura, 1989; Bandura, 2001). Those are highly related to one's self-regulation, self-reflection, and self-influence (Bandura, 1991), a clear demonstration of how cognitivism places an emphasis on the individuals as an agent of their own learning, something that was not considered by behaviorism. According to cognitivism, central to a person's learning are goals that most likely relate to one's perceived self-efficacy, which is one's belief that a task can be achieved should the proper resources (cognitive and non-cognitive) be mobilized (Wood & Bandura, 1989). In addition, a person's values and motivations are also considered to play an important role (Winne, 1985), as

humans engage in the act of learning having some assumptions about it in advance, reflecting on it while it occurs, and then evaluating at the end whether the learning has been useful or not. Furthermore, human learning is not bound to directly experiencing something (enactive learning), but rather it can occur also by observing (vicarious learning) and then mentally analyzing that observation (Schunk, 2012, p. 118; pp. 121-122). This was an anti-thesis to behaviorism which emphasized empirical practice of a response to a stimulus for learning to occur. On the other hand, cognitivism stresses the importance of environment in a similar way that behaviorism does. The main difference, as explained by Bandura (1986, p. 51), is that rather than assuming that the environment is the main cause of learning, instead it is the interplay between one's mental interpretation of the environment, behaviors occurring in it (both by the individual and others), and past experiences stored in one's memory. Bandura's model is illustrated in figure 3.

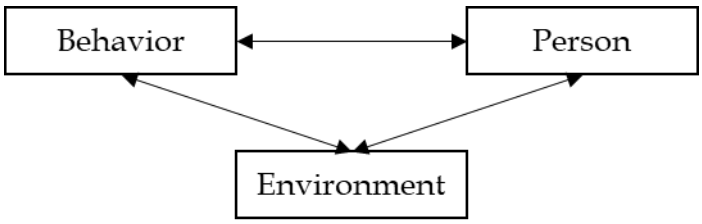

Figure 4. Bandura's Triadic Reciprocity Model of Causality (1986)

No single element of this triadic relationship dominates the others. Instead, at any given time and based on the circumstances, one may prevail over the others. For example, if a person is being told that she/he can choose what to eat, then it is the person that 'pulls the strings', probably with a slight moderation from the environment, since it is highly unlikely that all possible food options will be available to a person at an instant, although that would be indeed amazing! On the other hand, assuming that a group of people have agreed to go out to play football, but suddenly there is a heavy rain, then it would be the environment that commanded the behavior, with the persons involved exerting limited control over it.

What is central to cognitivism is that the person mentally processes sensory inputs from the environment that eventually form the behavior. The input normally is weighted against pre-existing models within a person's mind that are stored in one's memory, eventually leading to the desired response that would bring positive consequences, or respectively the avoidance of responding in a way that would bring negative consequences (Ertmer & Newby, 2013). Said models represent meaningful knowledge (as perceived by the learner) that is structurally organized and can be retrieved from the memory when need be. The sources that cause modelling to occur vary across a range of actors (for example teachers, students, parents, coaches, friends), and the decision for adhering to a

model depends on various personal settings, such as an individual's developmental status, possible consequences of a response, expectations of the outcome, goals, values, and self-efficacy, as well as the model's prestige and competence (Schunk, 2012, p. 134). Respectively, all these personal settings listed in the previous sentence are subjective in nature and vary from one individual to another.

According to Schunk (2012, p. 161), the knowledge transfer or in other words the learning of an individual eventually will occur once knowledge is stored in memory, whereas Ertmer & Newby (2013) add that this happens once it is possible for the person to apply the newly obtained knowledge in different situations. Contrary to behaviorism, rather than focusing on what the learner does, cognitivism focuses on how the learner processes and organizes new information as an outcome of interacting with the environment, while the learner assumes an active rather than a passive role. Even though cognitivism significantly advanced our understanding about learning when compared to behaviorism, it still does not lack critique that stems mainly from the constructivist bloc (more on constructivism in 2.5). The main areas where cognitivism was criticized by constructivists, according to Greeno (1989), concern the following:

- Learning is an outcome of cognitive processing
- Reality is objectified externally, and thus its mastery by the learner depends on the mastery of cognitive processing
- Much emphasis on learning is placed within a formal educational setting, with little importance given to an individual's experiences obtained outside such a setting

Constructivists do not entirely disagree with cognitivism, but rather underline the uniqueness in the cognitions and learning of each individual with regards to constructing their own knowledge from their unique way of perceiving their experiences. In turn, knowledge and reality are not believed to exist in objective forms externally from humans, but rather it is constructed internally by humans themselves (Schunk, 2012, p. 274). And so, cognitivism in a way steps with one leg into each of the other two learning theories. Namely, it agrees with behaviorism in that reality is objective, while at the same time it agrees with constructivism in that cognitions are an important part of learning. On the other hand, it does not agree with behaviorism on ignoring cognitions, while at the same time it does not consider the unique construction of one's knowledge and reality, like constructivism does. As previously done with behaviorism (2.3.2), the following part parallels cognitivism together with opportunity discovery, which comes as an alternative to opportunity recognition, with the purpose of reflecting on a learning theory through the context of entrepreneurship.

2.4.2 Opportunity Discovery and Cognitivism

Apart from being recognized, opportunities are also believed to be discovered (Covin & Miles, 1999). Discovery implies that opportunities reside within the market, similar to the view on recognition and treatment of reality by behaviorism as being objective. However, rather than omitting signals to individuals, they are awaiting to be discovered by them, thus opening the door to investigating the mental structures of entrepreneurial individuals that lead to said discovery that results in new ventures and economic growth (Mitchell et al., 2002). This would then resemble the cognitivist approach where the reality remains objective, but rather than signaling to individuals about the 'right' and 'wrong' decisions, it can only be gradually mastered as humans develop their cognitive mastery. In terms of entrepreneurship, an individual will be able to discover the opportunities hidden within the market when enough cognitive resources are employed. In line with cognitivism, opportunity discovery underlines the interplay between the environment and the individual, as the market provides the food-for-thought for opportunities to be discovered (Webb, Ireland, Hitt, Kirstruck, & Tihanyi, 2011; Campbell, 2011). It would be hard to assume that an individual will discover any opportunities within the market unless there is a certain level of interaction between the two.

Nonetheless, the same reasons that open cognitivism to criticism can be paralleled to why opportunity discovery may not be the most suitable approach for explaining entrepreneurial activity. Namely, rather than dealing with an objective reality, which is what cognitivism and opportunity discovery both assume, individuals face heterogenous conditions that are beyond their cognitive mastery (Ertmer et al., 2013). For example, consider a scenario where an individual is forced to become an entrepreneur simply because it is necessary for survival, due to, for example, unemployment, low wages, or lack of formal education (Fairlier & Frossen, 2018). In this case, recognition and discovery have nothing to do with the decision to engage in entrepreneurial activity, but rather it was the life conditions that an individual had to face. Furthermore, the presence of formal institutions within a country that address financial, social, and educational aspects of life have a moderating effect on opportunities, as argued by Fuentelsaz, González, Máicas, & Montero (2015). In general, the socio-economic conditions, as well as an individual's personal motivations and ambitions have moderated to a significant extent the decision of an individual to pursue an entrepreneurial venture (Langevang, Namatovu, & Dawa, 2012; Giacomin, Janssen, Guyot, & Lohest, 2011). Said conditions vary depending on the location of the person, socio-economic status, and level of formal education, to name a few. Therefore, it would be incomplete to assume that opportunities objectively reside within the market and can be discovered simply by cognitive efforts, since there are way too many subjective factors in place bound to individuals, and those moderate to a significant extend the decision to engage in entrepreneurship, whether we talk about opportunity recognition or discovery.

Now if we turn to the pedagogical implications that concern enhancing metacognition within EE, cognitivism does seem more credible than behaviorism (see 2.3.2), yet it still lacks several important elements that concerns entrepreneurship – appreciation of one's uniqueness and room for creativity. Cognitivism does embrace cognitions as learners are expected to think and attempt to make sense of the external world, however it still treats the reality as being objective and simply mapped onto the mind of the learner (Ertmer et al., 2013). By doing so, cognitivism (as well as opportunity discovery) fails to weight in the unique experiences and conditions that an individual is experiencing. Although it contrasts behaviorism in that it does not treat learning as a simple stimuli-response relationship, but rather links a potential response to the mental processing by the individual, it nonetheless does not give much room for creativity. Putting this into the entrepreneurial perspective, individuals are merely expected to discover opportunities within the market and capitalize on them, rather than creating them. Yet, there has been empirical evidence (e.g. Sarasvathy, 2001; Sarasvathy et al., 2003) postulating that opportunities are neither recognized nor discovered, but rather created. Lastly, even cognitivists themselves tend to realize the importance of one's unique experiences as a mediator of how they construct their learning process which eventually leads to forming their own realities (Jonassen, 1991). The unique formation of those realities as an outcome of one's learning is what constructivism and consequently opportunity creation stand for, which are the next topics present in this review.

2.5 Learning as a Function of Construction

Constructivism is a learning theory that blends psychological (such as cognitions) and philosophical (such as rationalism and empiricism) elements to claim that much of learning and understanding within humans depends on how humans construct the world in which they live (Fox, 2001;). Often seen as complementary to cognitivism (Ertmer et al., 2013), constructivism suggests that human learning is not an outcome of cognitively processing an objective reality, but rather the formation of one's reality and cognitions as an outcome of events and situations that one has experienced (Bredo, 1997). Said situated cognitions that enable learning are unique to each individual and are affected by different variables such as culture, context, and activity (Brown, Collins, & Duguid, 1989). In a certain way, constructivists do not entirely disagree with cognitivism, but rather underline the uniqueness in the cognitions and learning of each individual with regards to constructing their own knowledge from their unique way of perceiving their experiences. In turn, knowledge and reality are not believed to exist in objective forms externally from humans, but rather it is constructed internally by humans themselves (Schunk, 2012, p. 274).

Following its own principle of uniqueness, constructivism has many approaches and perspectives (Perkins, 1999), which naturally have generated a diverse debate surrounding it. This may not be particularly in line with scientific principles, and that is why constructivism sometimes is not considered as a theory, but rather a philosophical stance. In addition, a bald constructivist claim could be that learning cannot be theorized per se, because it is not a priori generalizable, but rather a product of each human's subjective construction of the world. Constructivist debates have been spawning across centuries, however according to von Glasersfeld (1984), not much has been added to what was originally questioned, but rather known things are reorganized to present something supposedly new. The original question concerns reality and whether it exists externally from the humans or constructed internally by them. Constructivists tend to the side with the latter statement. However, that debate is not the focus of the present thesis, as it concentrates on two contemporary constructivists and their contributions, namely Jean Piaget and Lev Vygotsky. Both are thought to have contributed significantly to the study of constructivism, and each one of them is credited for establishing two distinct branches of it – Piaget being responsible for cognitive constructivism, and Vygotsky for social constructivism (Liu & Matthews, 2005). The following part covers their contributions to the understanding of constructivism, as well as the critique that both have received.

2.5.1 Piaget & Vygotsky

Jean Piaget was strongly convinced that humans actively interact with their environments by investigating them in order to formulate their learning, rather than passively react to presented stimuli (Fox, 2011). He pointed that learning, and consequently, one's understanding of the reality, is constructed by the individual as life progresses, rejecting the notion that reality is objective and permanent, awaiting to be mapped onto the learner. His views posed as an enemy of the traditionalist view of education which assumed that a learner is passive, resembling to some extend an empty vessel awaiting to be filled with whatever the instructor desires. Piaget advocated for instruction to be navigated towards bringing new and creative ideas from learners, with such ideas respectively being an outcome of one's construct (Duckworth, 1964). One may argue that creating and constructing are not so far from one another in terms of meaning, and perhaps could be called synonyms. Now, assuming that the purpose of EE is to help students create new ideas, ventures, concepts, or companies, we a priori reject the notion of the objective reality, and rather look for the unique creations of our students, which falls well in line with what Piaget advocated.

Piaget believed that learning is based on the principle of equilibration, which was further categorized into assimilation and accommodation (Schunk, 2012, p. 274). When a person is presented with a new piece of knowledge, it must be weighed against existing schemas and beliefs of the reality as perceived by the individual

in concern (Duncan, 1995). There are two paths of equilibration that the individual can choose. Either reality can be assimilated to existing structures within the mind, or it can be accommodated, thus leading to a change in said structures. If a given situation matches something that already has been known (constructed), then the learner assimilates that situation to existing structures. On the contrary, if the situation in a way does not make sense as a result of not being able to assimilate to existing constructs of reality, then the learner is forced to accommodate the newly given situation, thus reconstructing their understanding of reality within their minds (Rowell, 1989; Roessinger, 1978). These two processes are in interplay with one another, because as we assimilate reality to existing structures, we accommodate new structures to make sense of it. In Piaget's view, the environment provides the food for thought to the learner, but eventually it is humans that assume control over their learning, whereas the environment is able to merely provide a direction (Schunk, 2012, p. 238).

In Lev Vygotsky´s view, reality and learning are not merely constructed in an individual's mind, but rather they depend on one's social activity (Kim, 2001), while at the same time the social environment acts as the facilitating force of learning (Tudge & Scrimsher, 2003). Rohrkemper (1998) stresses Vygotsky's Marxist views with regards to his emphasize of social interactions as critical to learning, since they were falling in line with the revolutionary movement after 1917 in communist Russia (Schunk 2012, p. 241). Therefore, in Vygotsky we see an example of a situated cognition where the cultural context in which the learner finds himself impacts his learning and construction of reality (Brown et al., 1989). Vygotsky emphasized interpersonal relationships among humans as a facilitator and mediator of learning (Schunk, 2012, p. 242). He believed that a learner has the potential to achieve higher levels of mastery and knowledge, whereas that potential was determined by a tutor or more capable peers, who also had the responsibility of helping the learner to reach said potential. The former is known as the zone of proximal development (hereafter 'ZPD') defined by Vygotsky (1978, p. 86) as the difference between one's perceived level of development versus one's potential for development as perceived by someone who is more capable in the concerned area. These more capable peers form the latter assumption are known as more knowledgeable others (hereafter 'MKO') (Kim, 2001). In other words, ZPD concerns what learners can do on their own versus what they can do with the help of MKOs. The role of MKOs is to provide guiding, most often in the forms of providing hints that make the learner think. Respectively, as a learner progresses, the need for MKOs' presence will be diminished, unless there is a need for further development to be achieved, or until the point the learner surpasses the MKO in terms of content mastery.

Consider this example from basketball. At the beginner's level, a person will need constant instruction and guidance from a coach in order to learn how to properly shoot the ball. After practicing and receiving constant feedback from the coach on the form of shooting, eventually the player will master the shooting technique

and will be capable of shooting the ball appropriately without the coach having to tell the player how to do so. The learner is not passive, but rather brings into the process her/his own perspectives with a possibility of reciprocal teaching, meaning that there is a good chance that the instructor will assume the position of the learner and will develop as well (Schunk, 2012, p. 246). The outcome of the coaching eventually is that players construct their technique in their own unique way with the help of their coaches rather than adhering to one single standard of shooting. In the end, the common goal is to score the ball into the basket, yet each player chooses their own unique technique to reach the goal.

The main difference between cognitivism and constructivism is that the latter assumes that learners construct their own understanding of the world and themselves via employing their cognition, rather than mastering the external, objective reality through it. In the basketball example presented above, behaviorists and cognitivists would assume that there is only one shooting technique. Whereas behaviorists would claim that repeated practice will eventually allow the player to master the technique, cognitivists would assume that the technique can be also mastered by observation and analysis. On the other hand, constructivists would recognize the need for having a shooting technique, but they would encourage players to develop their own.

2.5.2 Raised Concerns

Given Piaget's arguable impact on constructivism, his theories have not been short of critique (Lourenco & Machado, 1996). He has been called for limitations with regards to how he explained his concepts, their empirical application lacking easy replication, and his views lacking argumentation either from a philosophical or epistemological point of view. For example, consider the terms assimilation and accommodation. Both indicate some change that has occurred in a person's mind, but how is it possible to operationalize this change to be able to measure it through observable behavior, and by doing that linking it to the change that had occurred in the mind? (Carlson & Buskist, 1997). Respectively, given this question, Piaget's concepts are thought to test and replicate empirically, despite their perceived validity in terms of how they are described (Brainerd, 1978). Another common critique towards Piaget is that of ignoring the socio-cultural influences that a learner is experiencing, and by doing so he over-emphasized the role of cognitions with regards to how one learns (Valsiner, 2001). As noted earlier, Piaget does not discredit entirely those influences, but rather diminishes their importance, contrary to social constructivists, such as Vygotsky. Curiously, studies later demonstrated that although Piaget did not put a premium on socio-cultural aspects, his very own samples (studies conducted primarily with Swiss children), and respectively the results they generated, were heavily influenced by the Western schooling and culture. Thus, Piaget's constructivism is believed to be 'cognitive', seeing learning as an outcome of how one's

mind creates meaning, and that is where Vygotsky would disagree by introducing social constructivism and the dynamics between human interaction and culture as mediators of one's constructed learning.

Curiously, when turning to Vygotsky, he is criticized for the same reason as Piaget – only in reverse. Whereas Piaget's cognitive constructivism was called for ignoring the social influences on one's learning and overemphasizing the individual, Vygotsky's social constructivist has been criticized for overemphasizing social influences and ignoring the individual (Lui et al., 2005). Perhaps the answer lies somewhere in between, but this is rather odd scenario. Vygotsky's key concepts have also come under scrutiny. The ZPD is thought to be difficult to map for a student, and at the same time it is excessively stressing the development of a learner as being dependent on the MKO (Chaiklin, 2003), as well as the formal educational setup in general. Yet, it was pointed out to him that people learn a great deal outside the schooling system as well. Furthermore, because Vygotsky placed an emphasis on authority within learning, he saw rules as being more important than individual imagination (Saifer, 2010). This is not to say that he discredited the latter, but rather did not see as beneficial to learning as setting strict rules that must be followed. His Marxist views regarding an equal society have also received some fire. Although it does sound desirable to have a truly equal society, Vygotky's theory is somewhat utopian, because as stressed by the critics, societies do not tend to be equal, thus limiting the possibilities of some people against the others (Lui et al., 2005). To give an example, individuals with some sort of disability that limits their speech would find social learning more difficult than those who do not have any problems. Perhaps for that reason sometimes Vygotsky's views are considered overly optimistic.

Regardless of the critique that both scholars have received, it should be noted that the emergence of constructivism was an outcome of previous concerns raised towards behaviorism and cognitivism. Human learning is a complicated matter and it is unlikely that we will arrive to a single theory that could account for all of it. Perhaps the big leap that constructivism did was to not treat reality as being objective (as its predecessors did), but rather as an outcome of one's construct. In addition, it placed an emphasis on the uniqueness of each individual. By doing so, the theory immediately switched the role of the learner from passive to active, while at the same time it converted the role of the teacher to that of the facilitator, thus the role of the latter is not to teach something what is already known, but rather help the learner to create new meaning about what is known. Respectively, the theory of opportunity creation allows to draw parallels between how people construct their learning and how they create their ventures, rejecting the notion that they are either discovered or recognized from within the objective world.

2.5.3 Opportunity Creation and Constructivism

Consider the two following examples. An individual may see a corrupted regime as a factor that negatively affects the entrepreneurial potential (Hashi & Krasniqi, 2008) of his/her venture. Yet, on the other hand, someone else may see this as an opportunity for avoiding taxes. Now consider a city that lacks incubation services for startups. One may see this as something that dampens the entrepreneurial potential, but someone else may see an opportunity for creating a company that focuses on incubation services. The interpretation of the reality is eventually the one that will dictate whether to pursue entrepreneurship or not, and that differs based on how each individual subjectively creates meaning out of their world. Respectively, constructivism can be put within the entrepreneurial context when reading about opportunity creation. The latest addition to the literature of entrepreneurial opportunities was the understanding that they are created, following the views that they are recognized or discovered (Sarasvathy et al., 2003). If we choose to follow this line, then we assume that opportunities are constructed within the minds of individuals and posit a subjective nature. The uniqueness of each individual is highlighted with regards to finding creative ways of utilizing existing knowledge and schemas to generate something new. Respectively, this is an ongoing process that never stops, as humans will constantly provide further innovations that advance what once was believe as the 'final' stage.

In an educational context, this would mirror constructivist views, where reality is perceived as something that continuously changes as individuals reconstruct it, rather than being fixed, objective, predictable, and measurable. Nonetheless, most of EE insofar has followed the latter principles, with research concerning entrepreneurship, and consequently the way it is being taught being stalled. In turn, academic experts in the field struggle to cope with the idea of entrepreneurship itself – that is, an idea that demands innovation and creativity on a constant basis (Meyer, 2011). In a similar tone, Neck et al. (2011) advice for EE to relinquish itself from trying to be predictable. In other words, rather than trying to teach entrepreneurship following the rules of natural sciences, we should embrace the traits of entrepreneurship, such as critical thinking, creativity, and problem-solving. If we choose to agree that opportunities are created as an outcome of one's construct, then we must consider the unique path of each such creation. In turn, that uniqueness may be beyond the reach of the scientific principles, since their goal lies in objectification, however constructivism rejects objectification per se, at least when it comes to human learning (Ertmer et al., 2013).

On the other hand, we should consider whether that poses a problem or not. In the end, individuals are subjective beings and sometimes it may be difficult to objectify them and set out a common standard for their analysis (Pandey, 2014; Hayek, 1945). This may be the reason why academia cannot find a single approach towards entrepreneurship research (Low & MacMillan, 1988; Shane & Venkataraman, 2000; Mitchell, 2011) – because you cannot find a single approach

towards subjective individuals, which lie at the core of entrepreneurial activity. Respectively, the way we view entrepreneurial activity directly affects the way in which we will teach in our classrooms. And so, to put all theories together, the following part assesses their views with regards to two important components that have been outlined as being central to this study: first, the interplay between metacognition and critical thinking (Kuhn, 1999), and second, the understanding that entrepreneurship involves unique creations by individuals facing heterogeneous conditions (Shane et al., 2007; Sahut et al., 2014).

2.6 Implications for Instructing Metacognition Within EE

How we perceive entrepreneurial activity and from which learning lens we decide to approach the pedagogy surrounding it go together. Constructivism agrees in much with opportunity creation in that they do not treat reality as being objective. Instead, both claim that individuals face heterogeneous conditions in their lives, therefore opportunities are not equally spread out around the world waiting to be either recognized (which is what behaviorism would stand for) or discovered (which is what cognitivism would stand for). Cope (2005) argued that entrepreneurship is a dynamic learning process, while other authors have underlined that entrepreneurship cannot be treated as something predictable (Neck et al., 2011; Sarasvathy et al., 2003). Instead entrepreneurs seem to keep learning novel things from their unique experiences by reflecting on them, in what is widely labeled as experiential learning (Mason & Arshed, 2013). That very learning falls in line with the constructivist principles on education, while at the same time it stresses the importance of reflecting on one's learning – the cornerstone of metacognitive awareness (Schraw et al., 1994). It should not then be surprising that critical thinking (which entails analysis and evaluation at a cognitive level) is closely related to metacognition (Kuhn, 1999), and at the same time metacognition has been outlined as a critical resource for possessing an entrepreneurial mindset (Haynie et al., 2010), while also being directly linked to the capability of being creative (de Acedo et al., 2013).

Constructivism and metacognition are complementary to one-another, since the former concerns one's construction of their ideas, while the latter enables an individual to understand where the ideas came from, thus allowing for their reconstruction and alteration (Gunstone, 1998; Huq et al., 2017). From the three theories that were reviewed, constructivism seems to be the most effective for the task of the present study – teaching metacognition within the context of EE. That is because it considers the two components introduced earlier (see 2.2.1) and briefly stated once more in the above paragraph. Namely, it embraces creativity, which is important for the entrepreneurial context of the intervention, and it also encourages critical thinking, which is what metacognition is built upon. The table below presents each theory when weighted against those two components.

Table 2. Review of Learning Theories With the Purpose of Teaching Metacognition Within EE

Learning Theory	**Does it account for creativity?**	**Does it encourage critical thinking?**
Behaviorism	No. Behaviorism treats reality as being objective and external to the individual. The reality is then 'imposed' on the learner by the instructor.	No. The learner assumes a passive role and will be taught the things that only the instructor wishes to.
Cognitivism	No. Like behaviorism, reality is perceived as being objective, but the learner can gradually master it with cognitive efforts.	Partially. Learning is seen as a process where the individual engages in mental activity with the purpose of codifying knowledge and storing it in one's memory.
Constructivism	Yes. It is assumed that individuals create/construct their reality, considering their unique experiences, which are very important to the process of learning.	Yes. Social interactions are deemed important, and students are expected to bring their views on their learning process. The goal is to create knowledge, not to absorb it.

Having chosen constructivism as a theory to approach the task at hand, a reasonable question concerns the choice of how the intervention will be conducted. Curiously, although scholars are calling for new approaches to entrepreneurship pedagogy (Ling et al., 2015), there seems to be one that matches the parameters mentioned above with regards to finding a suitable instructional method to teach metacognition within an entrepreneurial classroom. The catch is that it can hardly be labeled as innovative since it was introduced roughly 2500 years ago in ancient Greece, with some entrepreneurship scholars believing that its elements should be forming the cornerstone of EE (Neck et al., 2018). The following part introduces a constructivist pedagogical approach known as the Socratic Method, addresses its benefits, places it within the context of EE, and discusses its challenges.

2.7 The Socratic Method

Socrates was a Greek philosopher that lived in ancient Athens, roughly between the years 470-399 BC (Easterling, 1997, p. 352). Even though he has contributed widely to Western philosophy and values in general, his biggest contribution is thought to be the Socratic Method (hereafter 'SM') (Morrell, 2004). It is a form of instruction that uses as a basis for learning the dialogue between the teacher (facilitator) and the students; one that begins with a question that the facilitator poses to the students (Ross, 2003). The essence of the questioning is the 'elenchus', which means 'cross-check/verify/test' (Vlastos, 1982; Oxford University Press, 2019). Simply put, the SM is about finding answers through posing questions. Most of our 'original' sources regarding SM come from Plato's work, who was a student of Socrates (Brickhouse & Smith, 2009). In today's contemporary world, synonyms of SM include discovery learning (Bruner, 1961), inquiry teaching (Collins, 1977), and inquiry-based learning (Healey, 2005). Even though the names are different, in practice they slightly differ, if not at all. Their assumptions and claims remain parallel with the ones addressed within the SM, which in fact raises the question of why the SM has been renamed so many times? Said assumptions and claims are:

- all of them are thought to be of constructivist nature
- the facilitator poses questions to the class, rather than providing answers
- the students are active during the learning process, and their ideas are important and must be heard
- students are encouraged to reflect on their knowledge and experiences, attempting to derive new meanings
- dialogue is encouraged throughout the learning process

Socrates was concerned with the foundational principles and beliefs of the world he lived in and so he was questioning those with the purpose of getting to the truth, which for him represented such a reality that is based on reason and knowledge (Paul & Elder, 2007). There are three types of questions that can be used in the SM by the facilitator: exploratory, focused, and spontaneous (Paul & Elder, 2008). Examples of each, in the context of EE, is presented in table 2 below.

Table 3. Types & Examples of questions in The Socratic Method

Question type	**Example in the context of EE**
Exploratory	What is the role of entrepreneurs within the society? / What is the role of education in fostering entrepreneurs?

Focused	Why some people recognize opportunities better than others? / Why entrepreneurs are good with people?
Spontaneous	Assuming that a student has claimed that "entrepreneurs are only interested in making money", possible questions could be: Can you justify your answer? / What about social entrepreneurs?

Non-surprisingly, a similar type of questions is suggested for instructing metacognition. The questions address comprehension, connection, strategy, and reflection and are labeled as "metacognitive questions" (Shepherd & Patzelt, 2018, pp. 123-124). Each type concerns the four knowledge dimensions as stressed by the revised BT (see 2.2). Namely, comprehension questions address factual knowledge, connection questions address conceptual knowledge, strategy questions address procedural knowledge, and reflection questions address metacognitive knowledge. The suitability of the SM for instructing metacognition should not come as a surprise, because metacognition is heavily dependent on critical thinking (Kuhn, 1999), whereas Socrates is believed by many as its father (Hoaglund, 1993). Overholser (1993a) explains that questioning is only one of the six elements in the SM. The other five are inductive reasoning (Overholser, 1993b), universal definitions (Overholser, 1994), disavowal of knowledge (Overholser, 1995), self-improvement (1996), and virtue in everyday life (Overholser, 1999). The following table explains the purpose behind each of the five elements mentioned by Overholser and puts them into the context of entrepreneurship.

Table 4. 5 elements of the SM

Element of the SM	**Purpose**	**Entrepreneurship Context**
Inductive reasoning	Producing probable generalizations from the given information, without being certain that the conclusion is '100% right' (Arthur, 1994).	When an opportunity is created by an entrepreneur, there are no guarantees that it will work. The future cannot be predicted – it is constantly constructed by individuals.
Universal definitions	Deriving universal definitions with the purpose of deeper analysis (Overholser, 1994).	Entrepreneurs are the main reason behind economic growth.

Disavowal of knowledge	Rejecting an unjustified argument by the interlocutor, with the purpose of stimulating critical thinking (Vlastos, 1985).	Rejecting the argument that entrepreneurship is a 'special' trait that only a few people possess.
Self-improvement	Enhancing an individual's self-regulation, metacognition, self-motivation, and self-efficacy (Bartimote-Aufflick, Bridgeman, Walker, Sharma, & Smith, 2016).	The previous four elements eventually lead a person to constantly learn and improve previously held knowledge.
Everyday life virtue	As an outcome of systematic questioning and inquiry, a person seeks the ethicality and morality in everyday life (McDowell, 1979).	Ensuring that a newly created venture is conducted ethically, responsibly, and without harm.

All of Overholser's articles were published in *Psychotherapy, Theory, Research, Practice, Training*, which respectively concerns psychology, and more specifically, psychotherapy. That is because the SM is widely practiced by professionals in the field (Carey & Mullan, 2004). However, there is evidence supporting its application in the context of EE. The SM implies constant inquiry into an individual's self, as well as the surrounding environments through the employment of critical thinking. Socrates' goal was not to teach, but rather to facilitate learning within the minds of his students. His method resembles active learning that is advocated by constructivism. As put by Nelson (1980, p. 34):

> "*The Socratic method, there, is the art of teaching not philosophy, but philosophizing, the art of not teaching about philosophers but of making philosophers out of students*".

If we were to rephrase Nelson with regards to EE, then the statement would sound like this:

> "Entrepreneurship education is not about teaching entrepreneurship, but of making entrepreneurs out of students".

2.7.1 Known Benefits

The various benefits deriving from the SM are well-documented. Perhaps, critical thinking is the most obvious one (Whiteley, 2006), as Socrates is considered the

'father' of critical thinking, since his questioning led to that very thinking (Hoaglund, 1993). It also enables the occurrence of a meaningful dialogue within the classroom that deepens the exploration of a topic, which also improves communication in general (Knezic, Wubbels, Elbers, & Hajer, 2010). Furthermore, since critical thinking and metacognition are highly related, there is speculation that Socrates was one of the first people who became aware of metacognition and systematically employed it (Tanner, 2012), although he obviously did not coin the term itself at the time when he was alive.

In today's world, where students can get easily distracted during a lesson, the questions employed by the SM can prove useful in engaging students into the conversation and keeping their interest (Gose, 2009). The role of the teacher becomes that of the dialogue facilitator, which further generates the possibility that the teacher will also fulfil the role of the student, as students raise critical questions towards the facilitator, making him/her to think on their own (Kayne & Altman, 2005; Brickhouse & Smith, 2009). This is also known as reciprocal learning (Schunk, 2012, p. 246), which is favored by constructivists. In turn, such a scenario gives the room for the facilitators to become reflective of their work and ask critical questions that concern their knowledge about the subject that they teach, whether that knowledge is adequately structured for the students to master it, and assess the possibility of prevailing biases with regards to how the students will be treated (Calderhead, 1989). Reflective teaching leads to better outcomes for students, since the quality of instruction constantly improves as teachers place students' needs and priorities above their own. In general, the SM falls well in line with what a learning environment should be like from a constructivism point of view (Brooks & Brooks, 1999, pp. 35-85), namely:

- consideration of problems that are of relevance to the students,
- focus on a cyclical relationship between deduction and induction,
- appreciation of students' input into the lesson and learning process,
- adaptation of curriculum to match the student needs, and
- assessment of learning within the context of teaching.

Students can also benefit from the SM by avoiding misconceptions and by monitoring their own learning (Lam, 2011). Since the process of monitoring one's learning is metacognitive, and metacognition goes hand-to-hand with critical thinking (Kuhn, 1999), it seems reasonable to choose the SM as the instructional method for facilitating metacognition within the context of EE, as SM's aim lies in stimulating metacognition, but it also happens to be of constructivist nature, and therefore it considers the uniqueness of each individual and in addition embraces creativity. Even though I could not find any studies explicitly referring to the SM as the method of instruction within an entrepreneurial classroom, there is nonetheless literature supporting the cause.

2.7.2 Socrates and Entrepreneurship Education

Neck & Greene (2011) explain that using practices that emphasize reflection is a 'must' for EE, since we perceive entrepreneurship as the cycle of acting, learning, testing, and experimenting. In addition, they do provide Socrates as an example for stimulating reflective and critical thinking. In a similar tone, but with empirical evidence represented through interviews with experienced teachers that use dialogue in their classrooms, Ehiobuche, Tu, & Justus (2012) conclude that educators should realize the strength of dialogue facilitation in EE, as it enables people to discuss their ideas, self-direct their learning, and create original ideas based on mutual feedback. This view is consistent with Maritz (2017) who collected responses from 38 international scholars focusing on EE. Inquiry-based pedagogies were highlighted by these scholars as something to be considered for future programme designs surrounding EE. Meanwhile, Hindle (2007) adds that historically Socrates has managed to show us that a student's critical imagination resides in the minds of the students themselves, rather than curriculum designs which claim to enhance creativity and innovations. In the same book where Hindle's article is published, Carrier (2007) recommends to pedagogues teaching entrepreneurship and innovation to adopt an instructional method not far from the one Socrates used, as this will not only enable the transfer of knowledge from teacher to student, but rather the facilitation of knowledge by the teacher and its consequent acquisition by the students. She also adds that such a pedagogical method will greatly assist students in their personal development.

Curiously, even though Neck & Corbett (2018) claim that SM is one of the foundational elements of EE, they provide no reference for tracing the empirical application of SM within the classroom and its impact on the students. In a similar tone and at a propositional level, Acar & Tuncdogan (2019) state that inquiry-based pedagogies will enhance the ability to innovate within students, and since innovation is a highly desired skill within the modern society, there is clear appeal to build, and consequently test empirically the impact of such pedagogies on student innovativeness. The appeal for using inquiry-based pedagogies within the context of EE is evident, however most of the publications that advocate is application this remain at the theoretical/propositional level. Respectively, the present thesis attempts at putting said pedagogies into practice, thus filling the gap.

2.7.3 Challenges to Consider

Despite the well-established benefits of the SM and more widely inquiry-based pedagogies, their actual implementation poses some challenges that should be considered by any instructor who plans to deliver content via the employment of said pedagogies. These challenges concern both the facilitators, as well as the students. Schunk (2012, pp. 268-273) explains that being an inquiry-based facilitator is not an easy task at all, because this is a rather challenging skill that requires

practice, a great understanding of one's self as a person and pedagogue, and advanced mastery over the content that is being delivered. These preconditions are necessary for instructors in order to pose such questions that will stimulate an interesting dialogue. Failing to ask the right questions may dramatically decrease the quality of the lessons. On top of that, it is of crucial importance to provide such an atmosphere within the classrooms where students will feel safe with expressing their opinions openly. Furthermore, Quigley, Marshall, Deaton, Cook, & Padilla (2001) pose four questions/challenges to inquiry-based pedagogy, namely:

1) How to measure the quality of the inquiry?
2) How to effectively encourage inquiry?
3) How to integrate inquiry and content, rather than treating them mutually exclusive?
4) How to help teachers in order for them to learn to manage effectively an inquiry-based classroom?

Another almost self-evident challenge is that of the time that is required to implement inquiry-based approaches (Baricaua, 2015). Teaching classes through the traditional method implies minimal involvement from the students as they are passive learners. The teacher simply must go through the content that has been planned and then the class ends. In this case, the teacher can easily calculate the time that is required, since there are little, if any, interferences during the lesson. On the other hand, when using inquiry/dialogue-based methods, time can indeed become a sensitive matter. In a hypothetical scenario that is not very far from reality, a dialogue surrounding a topic can go over the planned time that was allocated for discussing. Interrupting the students or not granting them the chance to speak will most likely generate negative feelings in them, which is rather undesirable. However, this does not solve the question – how to ensure a balance between dialogue and timely delivery of content?

In their 1999 article, Edinson, Gordin, & Pea outlined five main challenges that surround inquiry-based learning from the student perspective, however only three of them are listed below based on their relevance, since the authors discuss in their text the teaching of natural sciences. The three challenges are:

1) Motivation. Students' prior motivation in mastering the content that is being delivered will significantly moderate their desire to engage in dialogue-based lessons (Soloway, Guzdial, & Hay, 1994). The absence of motivation will most likely decrease engagement, whereas its presence will increase it. The risk of such a challenge is most likely to appear in mandatory courses, whereas it becomes smaller in elective courses, where the choice to enroll to a course resides with the students themselves.
2) Understanding the required investigative techniques. Here the authors (Edinson et al., 1999) argue that the students should understand what is

needed to engage in an inquiry. Failing to understand how to approach a task may result in student frustration.

3) Background knowledge. Students' prior knowledge will most likely moderate the extent to which they will be encouraged to answer a question. It is unlikely that they will experiment with answers, as they may be afraid. That is why a safe environment is a must for inquiry-based pedagogies. A potential way of dealing with this challenge is to know the level of knowledge possessed by the students' in advance. A simple pre-assignment can help instructors understand their future students better and plan the content according to their level of mastery.

It is not unfair to say that any pedagogical method poses challenges. The ones listed above concern inquiry-based methods, to which the SM adheres. Solutions always can be found, but that requires deliberate practice, self-reflection, and an open mind. Before proceeding to the pre-conceptual summary of this review, the concern of Kayne & Altman (2005) should be considered. The authors question in their article the societal preparedness for embracing entrepreneurship. What they mean is that the culture of each society will influence how its students perceive entrepreneurship as a career path. Parallels can then be drawn from this argument with regards to the SM. In countries with limited freedom of speech and strong totalitarian regimes, one may say that thinking critically (which is the essence of SM, as well as metacognition, which plays an important role in entrepreneurship) bares risks of being harmed. After all, we should not forget that Socrates was accused and found guilty by the Athenian government on two accounts: 1) impiety and 2) for corrupting the minds of the youth (Bowles, 2007). The penalty for that was death, yet everything that Socrates did was to question the Athenian pantheon and its Olympian gods, and enable his students to question things around them, which was labelled as 'corrupting'. Arguably, today we can state that Socrates' trial and execution was nothing but a poorly staged political game on behalf of the Athenian government. Therefore, it could be speculated that students may not engage in dialogue under the fear of not being allowed to be critical, which is something that is unlikely to be empirically validated. It is hard to imagine a teacher asking students "Are you afraid of being critical because of your country's norms?" and the student answering "Yes". While it is not my aim to go deeper into this issue, I nonetheless find its relevance justified.

2.8 Pre-Conceptual Summary of Key Concepts

The literature review chapter has covered a variety of concepts stemming from both education and entrepreneurship literature. It is at this point that this pre-conceptual summary brings together the concepts most relevant to this study and lays down their definitions as understood so far. The research question posed in

the introduction chapter addresses the goal of conducting an educational intervention with the aim of increasing student metacognition within the context of a course focusing on entrepreneurship. In turn, the pedagogical method chosen is that of Socrates, and the reasoning and understanding for doing so are presented below.

The entrepreneurial mindset – which enables individuals to deal with dynamic and uncertain environments and remain innovative (whether that is a company, venture, or simply an idea) – seems to be of metacognitive nature (Haynie et al., 2010). In turn, metacognition is broadly understood as a strategy for learning, where individuals are capable of acknowledging their thinking process whenever engaged in the process of learning, eventually leading to better outcomes, as metacognitively aware individuals assume greater control over their learning process by actively monitoring and adjusting it (Flavell, 1979; Schraw et al., 1994). Metacognition is commonly defined as "thinking about thinking" (Paul, 1990, p. 32), thus highlighting the element of individuals directing their thinking inwards when engaged in learning. It is not content-specific, but a general cognitive skill that can be taught (Ford, 2006). The very definition of thinking about one's thinking process postulates that metacognition is in close interplay with critical thinking (Kuhn, 1999), which involves analysis and evaluation of one's learning process (Mulnix, 2012). Those two, as well as metacognition, are higher order thinking skills that underpin creativity (Kratwohl, 2002; see also 2.2). Metacognition is not a synonym of critical thinking, because the latter can concern thinking directed outwards (e.g. analyzing an external event), however the former concerns being critical and reflective of one's learning process.

Given the entrepreneurial context of the intervention, as well as the role of critical thinking in being metacognitive, the SM has been chosen as the instructional method, which is of constructivist nature. Constructivism builds on the argument of individuals constructing reality (equal to their learning) through making sense of their unique experiences (Ertmer et al., 2013; Fox, 2001; Bredo, 1997). It embraces both creativity [which is what we believe entrepreneurs are good at (Shane et al., 2007)], as well as critical thinking, which is important for metacognition to develop (Kuhn, 1999). In turn, the SM is based on interactive dialogues between the facilitator and the students (Ross, 2003). The dialogues normally begin with the facilitator posing a question, with the purpose being to stimulate students' critical thinking via employing analysis and evaluation (Vlastos, 1982). When students provide their answers to the original question, the facilitator normally asks consequent questions to make them justify their answers and stimulate a dialogue between the facilitator and the students (Whiteley, 2008). Socrates – an ancient Greek philosopher and founder of the SM – is thought to be both the first person who systematically employed critical thinking (Hoaglund, 1998), as well as the one who first discovered metacognition (Tanner, 2012). In a certain way, one could say that the SM is the practical application of how metacognition is defined as a concept, because the SM aims at triggering a student's metacognitive

functioning, so that the student can then individually and consciously employ it. Respectively, the aim of this study is to understand the mechanisms in which the SM contributes to the development of metacognition within an intervention that aims at doing so, and the following chapter details the methodological approach.

3 Case Study Research & Data Triangulation

Given the educational nature of this study, it was natural to build a case study approach around it, meaning that something "specific, complex, and functioning" was examined (Stake, 1995, p. 2). Another definition is provided by Gerring (2004, p. 341), where case studies represent "an intensive study of a single unit with an aim to generalize across a larger set of units". Case studies are beneficial as they allow the examination of various phenomena as they occur, rather than post factum (Yin, 1994, p.23), while at the same time they enable a deeper understanding between the context of the research relative to its phenomenon. In this study, the case represents a group of teenage individuals enrolled into a private language school in Saint Petersburg, Russia, whereas they share the desire to study at a foreign university in English and interest towards entrepreneurship in general (more in 3.1). Adhering to an instrumental case study approach enables to better understand the phenomenon of metacognition, as well as the ways in which a SM-based intervention contributes to its improvement from the students' point of view. Tight (2017, p. 10) points out that case studies often involve qualitative research methods aiming at providing a deeper elaboration on statistics and quantitative analysis techniques. On the other hand, case studies do not exclude quantitative techniques, but they can also combine multiple data collection methods that allow for data triangulation (Eisenhardt, 1989). The purpose of triangulation is to reduce or counterbalance any deficiency that would be posed should only one method was used (Thurmond, 2001). Its definition stems from Greek language and the word 'τρίγωνο', meaning 'three angles', and it is common to depict it by using a triangle (Denzin, 2012).

For this study, the triangulation process involved the collection of both quantitative and qualitative data. More specifically, quantitative data has been collected using *an instrument* called 'measure of adaptive cognition' (hereafter MAC) developed by Haynie et al. (2009) that measures metacognition, whereas the qualitative data are represented through collecting students' *learning diaries*. The MAC was based on the instrument originally developed by Schraw etl al. (1994) which placed an emphasis on education in general, however Haynie et al. (2009) added an entrepreneurial flavor to the instrument, making it more specific to the study of entrepreneurship. As for the qualitative methods, they are common when studying metacognition as they enable a more detailed analysis of an individual's thinking process (Tobias & Everson, 2002). The idea of triangulating data was to find evidence within the learning diaries that would correspond to the numerical results obtained from the quantitative instrument, and vice versa. Having multiple viewpoints from several methodological approaches on the topic that is being researched allows for better accuracy of the findings, as well as their better interpretation (Jick, 1979). Figure 5 below depicts the triangulation process undertaken in this study.

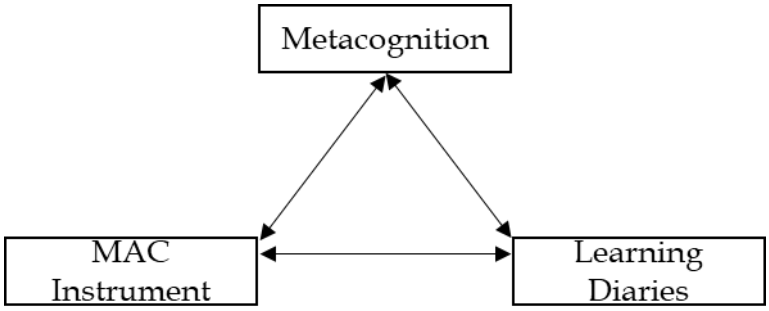

Figure 5. Data Triangulation for Studying SM's Impact on Student Metacognition

In general, there seems to be an agreement that metacognition is not that easy to measure as it postulates an internal cognitive process within the minds of individuals rather than an external, observable behaviour (Akturk & Sahin, 2011; Schraw, 2009). Respectively, cognitive processes may not as such be measurable. This perhaps may be the reason why understanding metacognition via qualitative means (such as interviews and self-reports) is a rather common technique (Tobias et al., 2002). On other hand, qualitative research may be hard to generalize (Stake, 1995, p.7), and in addition it can be quite time-consuming (Akturk et al., 2011), whereas quantitative techniques enable statistical analysis that brings the study closer to generalization (Tight, 2017, pp. 5-6). Therefore, considering the complexity of metacognition with regards to its measurement, and the fact that the present thesis represents a pilot study of its enhancement via a SM-based intervention, mixed methods and data triangulation seem a reasonable approach, as they have the potential to uncover the specific mechanisms in which the SM contributes to the development of metacognition.

3.1 Participants & Setting

Participants included 15 high school students coming from various schools of Saint Petersburg, Russia. They voluntarily enrolled into a course called 'Entrepreneurial Mindset' that ran intensively for three days, in addition to including assignments and daily homework during the course. To recruit the participants, a collaboration was established with a private language school, who advertised the course to its existing students that eventually formed the group. In order to participate in the course, the students had to be above the age of 15 and have adequate English language skills, since the instruction was in English. The mean age of the participants was 16.6 years. The classroom interactions followed the principles of the SM as expressed in this thesis (2.7). There are several reasons for choosing high school students for this study, namely:

1) Metacognition is thought to be maturing in early adulthood (Schraw, 1998), therefore high school students provide a sample where metacognition should be already present, yet not fully mastered. This makes the challenge of increasing it via an educational intervention even more valuable.
2) Although entrepreneurship is enjoying the spotlight from various policies and educational practices, little attention has been granted on integrating EE into school curricula (Elert, Andersson, & Wennberg, 2015), despite its potential of having a positive impact on entrepreneurial intentions of students (Peterman et al., 2003). Thus, this thesis attempts to fill this gap by offering entrepreneurship-related courses to a group of high school students.
3) If we want our students to develop metacognition and consequently be more entrepreneurial, then we should aim at helping them develop metacognition as early as possible.

Prior to advertising the course, a survey was conducted with 5 schools from the city where the course took place. One of the questions asked the students about their future workplace, with 40% (the highest) from a sample of 512 students replying that they would like to be entrepreneurs. When I asked their schools whether they offered to their students any elective courses related to entrepreneurship, they told me they did not. This pushed me further towards offering the course to high school students. There was a clear indication of demand for such a course, and the decision to offer it was both market and research driven.

3.2 Description of the Intervention

The course involved three contact lessons, each of which lasted for 4 hours in total. The lessons took place in consecutive days, namely: Friday, Saturday, and Sunday. Each lesson was split into two sessions. The first half lasted 1 hour and 45 minutes, followed by a 30-minute break, and concluding with another session of 1 hour and 45 minutes. The tables within the classroom formed an inverted U-shape, in order to better facilitate a dialogue among the participants, which was an essential part of the course. Each session had a focal question(s) that it was addressing with regards to entrepreneurship, and in order to answer the focal questions, additional questions were formed around the contents that facilitated the answers. The purpose was to make the students think about the topics that they are studying, rather than giving them raw answers. In addition, dialogue was utilized throughout the course by encouraging students to discuss with me, as well as with their peers. I also received a handful of questions on behalf of the students. In some cases, students were willing to answer to questions posed to me by their peers, a condition I gladly let happen. Microsoft's PowerPoint was used to present all the relevant materials, while at the same time a whiteboard

was used in order to mark down answers that students were giving to questions, which somewhat represented a mini-brainstorming session. The materials were not presented at once on the slide. Instead, the slide included the content-specific question at first, and then I addressed the question to the classroom. The students then began to give their answers, which I marked down on the whiteboard for comparing later their answers and the ones I had prepared on the slides. I always asked them to elaborate their answers, often by using the question 'why?' or 'can you elaborate/explain a bit more?'. After repeating several times this procedure, the students began to anticipate that I will do it again, so they took more time to answer, however, the second I was asking them to elaborate, they had already prepared the answer. Indeed, that is a metacognitive approach on their behalf, and it was nice to see the students planning their answers in advance. In addition, I often encouraged the students to discuss between each other, especially in the case where they had conflicting answers. Not only did they push each other to better formulate their answers, but once the students realized that I will be giving them the floor to discuss, they began doing so more often.

An example of a blank slide with only the content-specific question is given below in figure 5. The slide is from the first session, where the focal question was "how do we learn and what is entrepreneurship?" Respectively, the content-specific question that is depicted below addresses the topic of critical thinking.

Figure 6. Slide showing only the content-specific question

Following the initial dialogue that resulted around the question about critical thinking, I would start depicting the contents that formed the slide, triggering a consequent dialogue. For example, the slide shown in Figure 5 aims at introducing the SM as a mean to facilitate critical thinking. So, the first animation that would appear following the content-specific question would be Socrates' face. Then I would ask the class whether they know Socrates and some things about him. Indeed, a student was aware of the SM, which was the upcoming animation,

so rather than me explaining, I let the student do it. Following that, I asked the class whether they knew some quotes from Socrates, and once more, they knew both quotes that I had prepared on the slide. The same slide depicted in Figure 5 is depicted below, but this time in its full form.

Figure 7. Slide from Figure 4 With all the Content

As seen from the slides, there was little text on them. I followed the same approach for each slide that I had made. I thought of the content that I want to put on the slide, and then I formed questions around that content, as well as visuals that best capture the content. Each lesson included approximately 10 slides, but the slide quantity does not matter that much. Rather, it is the slide quality that matters more and how accurately the slide captures the content that is meant to be discussed, in addition to having questions in mind that would be formulated around the slide. I had a printed version of the slides in front of me, together with accommodating notes per each slide. Those notes acted as a guide for me throughout the course. The notes included questions to be asked from the students, as well as mistakes to avoid during the presentation of the slide. Naturally, the dialogues that were occurring were leading to spontaneous questions that were not planned, but that is one of the main elements of the SM (Paul et al., 2008). In addition, I had printed out the slides for the students so that they can take notes whenever they pleased. Often, I asked students to draw their answers, in case the slide involved a figure that would appear. For example, on a slide that concerned the factors of production in the traditional economy, I first asked them to draw them. Students took some time to draw and then compared their answers with one-another, before presenting their answers. The slide is depicted in figure 7 below.

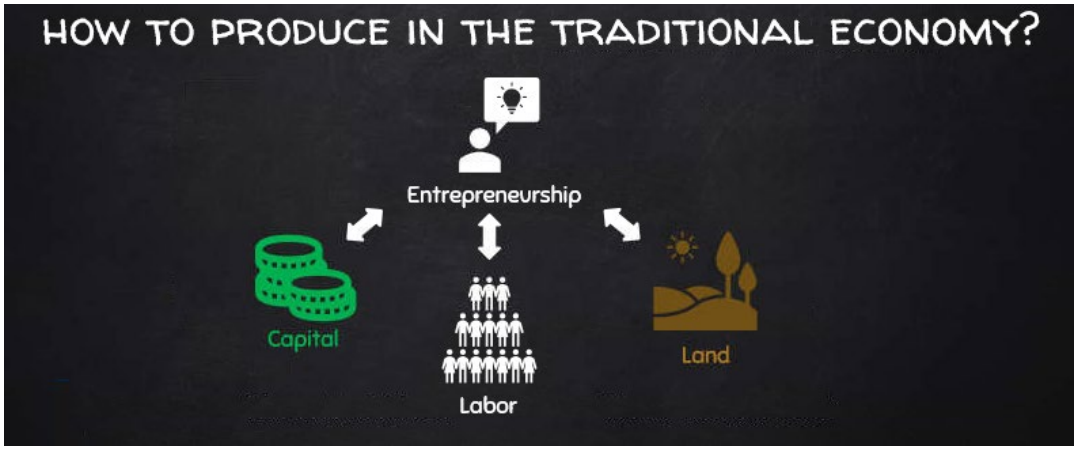

Figure 8. Slide about factors of production in the traditional economy

Once again, rather than showing them the actual contents, at first only the question was visible. Then the students drew their ideas on their notebooks (which were distributed at the beginning of the course), and only after they compared them, I showed what I had planned on this slide. In summary, the intervention can be described in steps in the following way:

- **Step 1**: Present the slide with the content-specific question that relates to the overall session-specific question
- **Step 2**: Facilitate a dialogue around the content-specific question by asking relevant questions that were planned in advance, as well as spontaneous questions based on students' answers
- **Step 3**: Make the contents appear one-by-one on the slide, and generate consequent dialogues each time content is presented

It is important to mark down occasionally the answers that the students are giving, as they may serve as future content. This refers to reflective teaching (Calderhead, 1989) introduced earlier, where the facilitator re-assesses what is known about the contents that are to be delivered. Whereas most of the course was based on the SM, the last part of the third session was devoted to applying the knowledge that was discussed and obtained into practice within the context of entrepreneurship. Therefore, participants were given 1 hour to prepare in teams of 5 a maximum 10-minute presentation about an entrepreneurial idea that they would like to pursue. All three groups addressed societal problems within their country, which makes them subject to social entrepreneurship (Petrella et al., 2014). The first group presented the idea of an eco-friendly, zero-emission restaurant, the second presented a helping center for army dropouts, and the last group presented an educational organization that deals with high school graduates that did not make the cut to the universities.

3.3 Data Collection

Data was collected using an online, cloud-based software that acted both as the learning diary and also included the MAC measurements. Students received an email from the instructor prior to the course with a link that guided them to the learning diary. The link was reusable, meaning that the students could access their online learning diary whenever they pleased. Before the first session and after each consequent one, the students had to submit their answers into their diary. Permission to use anonymously the learning diaries and MAC measures for research purposes was obtained both in face-to-face interactions with the students prior to the first class, while at the same time they had to answer to the question concerning permission at the very beginning of their learning diary.

3.3.1 The MAC Instrument & the Five Dimensions of Metacognition

For the quantitative part, a pre and post measurement using the MAC was taken. The pre-measurement had to be completed by the students maximum two days before the course began, while the post measurement was completed within maximum two days after the course ended. Pre/post measurements are common in research that concerns educational interventions that aim at quantitatively measuring changes in student learning (Morris, Webb, & Singhal, 2013), despite their known limitations that concern socially desirable responses, reluctancy to answer the questions seriously, and not being able to understand fully what is being asked (Baker & Cerro, 2000). To address these limitations, it was highlighted that the students should reply honestly to the MAC, while at the same time it was explained to them that there are no desirable answers. In addition, after the students submitted the pre-measurements, they were not visible to them up until the point when they had replied to the post-measurement, thus restricting them from taking a look at their original answers before they had submitted the new ones. Furthermore, examples were given to the students with regards to how they should answer the instrument.

The MAC consists of 36 items that students had to assess on an 11-point, semantic differential measure (Heise, 1965), anchored on the left with the statement "not very much like me," and on the right with the statement "very much like me" (Haynie et al., 2009). Respectively, the closer the answer was to "very much like me", the higher a student's metacognition as self-reported, whereas the closer the answer was to "not very much like me", the lower. Following a factor analysis, the authors of the instrument deducted that the 36 items load on 5 distinctive dimensions of metacognition, namely: goal orientation, metacognitive knowledge, metacognitive experience, metacognitive choice, and monitoring. Goal orientation concerns the extend to which a person interprets the environment when weighted against personal motives, and then decides to set a goal

that relates to a novel task (i.e. learning). Metacognitive knowledge and experience are the extent to which an individual relies on what is already known and what has been already experienced with regards to the set goal, in order to produce alternative ways of dealing with the task and eventually choosing the best one. Respectively, the process of selecting the appropriate strategy for learning refers to metacognitive choice. Lastly, monitoring refers to the individual's search for feedback that would be useful in re-evaluating the prior four dimensions. An example an item corresponding to each of the five dimensions is presented below in table 5:

Table 5. Definitions of the Five Dimensions & Examples of MAC items

Dimension	**Example Item**
Goal Orientation	I often define goals for myself
Metacognitive Knowledge	I try to use strategies that have worked in the past
Metacognitive Experience	I am good at organizing information
Metacognitive Choice	I re-evaluate my assumptions when I get confused
Monitoring	I ask myself about how well I am doing while I am performing a novel task

MAC was administered as per the instructions of its authors (Haynie et al., 2009). The items were presented in random order to the students and in addition, the orders differed in the pre and post measurements, which was another attempt to reduce bias. The full set of items as per the dimension on which they relate can be found from appendix 1.

3.3.2 Learning Diaries

Students were asked to keep learning diaries by answering to questions that concerned the contents that were covered during the course. Learning diaries are common in educational interventions that address metacognition (Tobias et al., 2002; Schmitz & Perels, 2011), while at the same time they fit the constructivist approach to education, since students have to think on their own about answering questions that are posed during the course, rather than receiving answers from the instructor (Schunk, 2012, p. 276). Students had to answer to questions that would be discussed in the upcoming lesson, and by doing so, they were coming to the lesson prepared to participate in dialogues since they had already formed answers to the questions that were posed in the classroom. The students had to make in total four entries. The first entry concerned the students' motivations with regards to attending the course, and consequently asked questions related to the contents of the upcoming first lesson. The second, third, and fourth entries started with a question that was reflecting on the previous session, fol-

lowed by questions related to the upcoming lesson. To give an example, the questions of the first and second entries are presented below in table 6, as well as the contents that were covered in the lessons corresponding to the entries.

Table 6. Examples of learning diary questions

Lesson	Questions	Lesson Contents
1	Tell about yourself and why you decided to attend this course? What is the best way for you to learn? Describe the reasons that make you learn better. What is entrepreneurship, in your opinion?	Introductions; Bloom's Taxonomy, Socratic Method, Metacognition, Microeconomics, Factors of Production, Knowledge economy;
2	What did you learn from the first session? Who is an entrepreneur and what qualities do they have? Why some people become entrepreneurs, and some don't?	Entrepreneurial Behavior, Entrepreneurial Personality Traits, Entrepreneurial Thinking

Not all questions were visible to the students straight away. Instead, when they first accessed their diary, only the questions related to the first lesson were visible. After the first lesson, they could see their answers from their first entry, and the questions concerning the upcoming lesson were made visible, but not their answers to the MAC. This was achieved through careful planning. By the time each lesson was concluded, the questions for the upcoming session were automatically open to the students. Respectively, after the last session, the questions had more of a reflective character, since there were no further lessons planned. The full set of questions split by session can be found from appendix 2.

3.4 Data Analysis

3.4.1 Computations of MAC Items & T-Test

Given the small sample size in this study (n = 15), it was not reasonable to conduct a factor analysis. Not only the authors of the MAC used 432 cases when they developed their instrument (Haynie et al., 2009), but also recommendations claim that the sample size for conducting factor analysis should vary from 3 to 20 times the size of the variables (Mundform, Shaw, & Ke, 2005). Following this recommendation, it would mean that the minimum sample size for conducting a meaningful factor analysis of the MAC for this study would be 108. Using SPSS, responses to the items from both the pre and post measurements were grouped based on the dimension on which they loaded in the instrument, and then their mean value was extracted. In addition, the newly computed variables were further aggregated into a 'total MAC score' variable. In total, twelve variables were formed, ten of which represented the pre and post measurements of each dimension as stressed in the article of Haynie et al. (2009), in addition to having a variable that extracted the mean from the five dimensions combined.

Table 7. Computed Variables in SPSS

Computed Variable	**Number of Items**
Pre/Post Goal Orientation	5
Pre/Post Metacognitive Knowledge	11
Pre/Post Metacognitive Experience	8
Pre/Post Metacognitive Choice	5
Pre/Post Monitoring	7
Pre/Post Total Mac Score	5 (mean from the above computed variables)

Such computations where the scores of individual items are summed and a mean sore is derived before applying statistical analysis are common when dealing with instruments that assess various traits (Murray, 2013). Following the computations, a paired sample t-test was applied. T-tests are used often when assessing students' learning as an outcome of an intervention, with their goal being to address whether the mean difference between what was observed in the pre and post measurements is zero, otherwise known as the null hypothesis (Weber, 2009; Pallant, 2011, pp 243-244). Respectively, an increase would mean that the intervention had positively affected students' metacognition, a decrease would mean that the intervention had negatively affected students' metacognition, and lastly a no change would support the null hypothesis, meaning that the intervention had no effect at all on the participants' metacognition as measured by the MAC. Furthermore, in order to address the effect size of the intervention on the results of the t-test, eta-squares were calculated, which is a rather common effect size

statistic that can tell how strong was the contribution of the intervention with regards to the observed changes from the t-test. According to Cohen (1988, pp. 284-287), an eta squared that is greater than 0,14 indicates a large effect of the intervention. Lastly, to address the instrument's reliability, which is an indicator of how consistent its measures are, Cronbach's alphas were calculated for the variables that were formed (DeVellis, 2012, pp. 109-110). The same was done by the authors that originally developed the instrument (Haynie et al., 2009), and although there are no agreed standards on the result that alphas should yield, it is commonly accepted that an alpha 0,7 or more indicates a reliable measure.

3.4.2 Thematic Analysis

Qualitative techniques were applied in this study by conducting a thematic analysis on the students' learning diaries. Thematic analysis is commonly used in qualitative research and consists of several steps, with the main essence being the extraction of aggregated meanings and ideas (i.e. themes) from a diverse sample of respondents (Braun & Clarke, 2006). Since the main question of the study was to find the mechanisms in which the SM possibly contributes to the development of metacognition, the analysis was focused on such extracts where the participants referred explicitly to the SM and its qualities. Combined, the learning diaries amounted to roughly 50 A4 pages, and I did not use any software for this task.

I followed the procedure as outlined by its authors (Braun et al., 2006). First, I became accustomed with the data by reading all the learning diaries separately, and already at this point I marked the extracts where the students were referring to the SM. This was an important step for isolating extracts concerning the SM from the ones concerning course contents, as normally student answers involved both content-specific data and SM-specific data. At this stage, I did not concern myself with what exactly the students were saying about the SM, so it was enough that they were just referring to it. Having isolated the SM-specific extracts, I started coding them, and then proceeded to identifying potential overlapping themes. Said themes emerged from identical characteristics that were found in the coded extracts, as they shared similarities in terms of their meaning and context. I had also drawn a map of the themes to visualize how codes were forming overlapping themes. Then, I further analyzed the themes in order to identify potential sub-themes that emerged, and then I compared them against the original codes that I had generated, in order to verify the underlying specifics of each theme. In the findings chapter that follows, the sub-themes are presented under the main themes in the form of similar answers given by the students. Throughout my analysis, I had the MAC items and definitions of the five dimensions printed in front of me, as well as the results obtained by the t-test. This was done to triangulate the results obtained by the measurements together with the learning diaries, in order to better understand the specific mechanisms in which the SM might have contributed to the changes in student metacognition. There were

also themes related to the SM that did not particularly appeal to the definition of metacognition, so those were left out from the findings section. Finally, once I had generated the themes together with their sub-themes, I read once more each learning diary individually to identify any potential extracts that I might have missed.

4 Research Findings

This chapter is split into two sections. First, the MAC measurements are presented by providing their descriptive statistics, Cronbach's alphas, and mean correlations. Then, the results of the t-test are provided, including the eta squared statistic. Following that, the second part introduces the findings from the thematic analysis, starting with the mechanisms in which the SM contributes to the development of metacognition, and then proceeding to their entrepreneurial context and student willingness to utilize metacognition in the future.

4.1 MAC Measurements

4.1.1 Descriptive Statistics, Cronbach's Alpha, & Correlations

The 36 items of the MAC instrument were computed to form mean averages based on the how they were loading on the five dimensions from the study of Haynie et al. (2009), in addition to generating a 6th variable that aggregated said means. Table 6 shows the descriptive statistics of the variables that were computed, as well as their Cronbach's alphas. The word 'metacognitive' was removed from knowledge, experience, and choice, and goal orientation has been renamed to 'goals'.

Table 8. Descriptive Statistics

		Pre Measurements			Post Measurements		
	N	Mean	Std. Deviation	Cronbach's α	Mean	Std. Deviation	Cronbach´s α
GOALS	15	7,80	1,33	,405	8,54	1,55	,794
KNOWLEDGE	15	7,80	1,14	,669	8,64	1,19	,793
EXPERIENCE	15	7,35	1,35	,626	8,32	1,49	,891
CHOICE	15	6,77	1,51	,513	8,30	1,76	,881
MONITORING	15	7,58	1,10	,461	8,80	1,15	,735
TOTAL MAC SCORE	15	7,46*	1,04	n/a	8,52*	1,23	n/a

* Mean extracted from aggregating the 5 computed variables
Note: Scale points ranged from 1 to 11

In the pre-measurement, the mean ranged between 6,77 and 7,80 across all variables. Goal orientation and metacognitive knowledge scored the highest mean, followed by monitoring, metacognitive experience, and metacognitive choice.

Standard deviations ranged from 1,10 to 1,35, with monitoring scoring the lowest and metacognitive choice scoring the highest. The average from the five dimensions was 7,46 with a standard deviation of 1,04. In the pre-measurement, Cronbach's alphas ranged from ,405 to ,669, failing to achieve the perceived norm of 0,7.

In the post-measurement, it was monitoring that yielded the highest mean, with metacognitive knowledge and goal orientation showing almost identical scores, similar to the pre-measurement. Metacognitive experience and metacognitive choice came last, while the total MAC score stood at 8,52 in the post-measurement with a standard deviation of 1,23. Cronbach's alphas exceeded the norm of ,7 for all variables, whereas all means, standard deviations, and Cronbach's alphas demonstrated an increase after the intervention. Even though metacognitive choice had the lowest scores in both pre and post measurements, it also demonstrated the highest change. Goals and metacognitive knowledge remained at a close distance in both measurements, however they had the smallest change in the post measurements from all variables. Monitoring showed the second highest increase, while metacognitive experience came third. The increased alphas indicated that the MAC had become more reliable in the post-measurement.

Table 9. Means correlation coefficients for Pre/Post measurements of the MAC

GOALS	1	,416	,751**	,447	,703**
KNOWLEDGE	,699**	1	,349	,773**	,679**
EXPERIENCE	,797**	,842**	1	,332	,555*
CHOICE	,140	,667**	,706**	1	,741**
MONITORING	,722**	,721**	,795**	,558*	1
	GOALS	KNOWLEDGE	EXPERIENCE	CHOICE	MONITORING

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Shaded area on the right side represents pre-correlations, non-shaded area on the left represents post-correlations

Shaded area in green applies to both measurements

In the pre-measurement, goals were significantly correlated at $p < 0,01$ with metacognitive experience and monitoring. In the post-measurement, goals became significantly correlated with metacognitive knowledge as well, although that was not the case in the pre-measurement. Goals and metacognitive choice did not correlate significantly in either measurement. Metacognitive knowledge was strongly correlated to metacognitive choice and monitoring in the pre-measurement, with metacognitive experience becoming the strongest significant correlation in the post-measurement. Metacognitive experience and monitoring were

significant at p < 0,05 in the pre-measurement, with a higher relationship being visible in the post measurement, in addition to the relationship being more significant at p < 0,01. Metacognitive choice and monitoring strongly and significantly correlated in the pre-measurement, however their significance went down in the post-measurement. Overall, there were more highly significant correlations (p < 0,01) in the post-measurement than in the pre-measurement. More specifically, the pre-measurement had 5 such correlations, whereas the post-measurement had 8. In addition, only one correlation was not significant at all in the post-measurement (goal and metacognitive choice) against 3 in the pre-measurement.

4.1.2 Paired Sample T-Test

The table below presents the findings. The word 'metacognitive' has been removed from knowledge, experience, and choice. The eta squared (effect size statistic) is not presented in the table but is included in the description of the results following table 10. Furthermore, when presenting the results for each of the 6 pairs separately, the graphs are plotted by taking into account the change in means +/- 2 standard deviations, as this would correspond to a 95% confidence interval (Wood, 2003, p. 89).

Table 10. T-Test Results

Paired Samples Test

		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	GOALS	,74667	1,35323	,34940	-,00273	1,49606	2,137	14	,051
Pair 2	KNOWLEDGE	,84848	1,04654	,27021	,26893	1,42804	3,140	14	,007*
Pair 3	EXPERIENCE	,96667	1,08610	,28043	,36520	1,56813	3,447	14	,004*
Pair 4	CHOICE	1,53333	1,58325	,40879	,65656	2,41011	3,751	14	,002*
Pair 5	MONITORING	1,21905	1,07430	,27738	,62412	1,81398	4,395	14	,001*
Pair 6	TOTAL MAC SCORE	1,06284	,78879	,20366	,62602	1,49966	5,219	14	,000*

* Statistically significant at p < 0,05

The impact of the intervention on the students' scores with regards to goal orientation as measured by the MAC was not statistically significant at p > ,05 even

though the mean did increase from 7,80 in the pre-measurement to 8,54 as can be seen from figure 9. The increased standard deviation (from 1,33 to 1,55) might be an indicator of the intervention affecting some more than others, as the observed values were more spread out from the mean in the post measurement. The overlapping standard deviations may inform that the differences between individual cases were greater than differences between goal orientation on average. When looking at range values, seven students scored below the mean in the pre-measurement, whereas only five did so in the post-measurement, indicating a moderate improvement on average. The minimum score in the pre-measurement was 5, with the same value for the post-measurement standing at 5,8. The maximum value obtained in the pre-measurement was 10,8, with 11 being the maximum in the post-measurement. Furthermore, seven students demonstrated an increase higher than the average (,74), with six of those having scores below the mean value (7,8) in the pre-measurement. Thus, it seems that the intervention had a bigger impact on students that scored below the mean in the pre-measurement, whereas students who scored above the mean in the pre-measurement had smaller gains. When combined, the observed changes are not statistically significant, although the eta squared (0,24) indicated that the intervention's impact was strongly related to the observed changes.

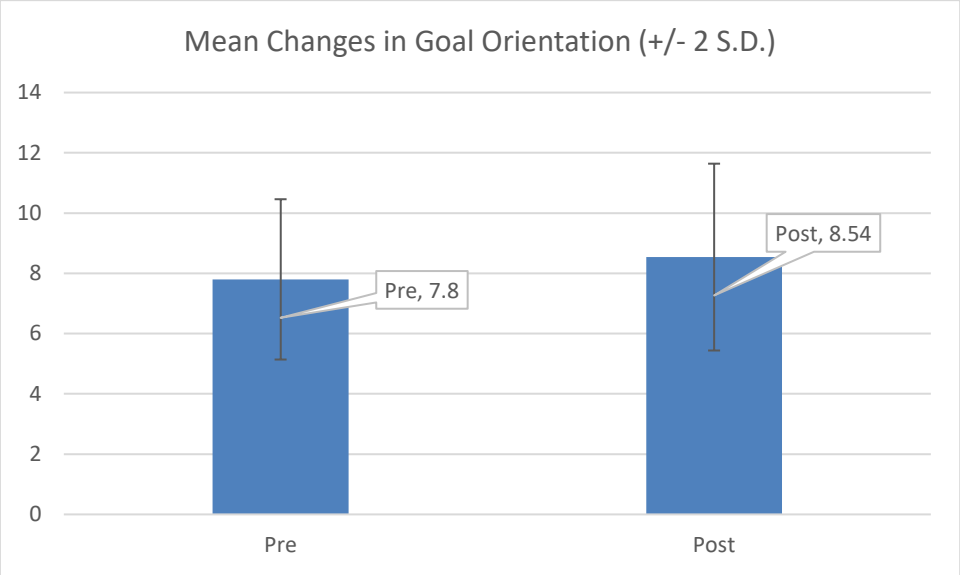

Figure 9. Goal Orientation

The impact of the intervention on the students' scores with regards to metacognitive knowledge as measured by the MAC was statistically significant at $p < ,05$. The mean score in the pre-measurement was the same as for goal orientation (7,8), with the score in the post-measurement standing at 8,64 as shown in figure 10. The standard deviation increased slightly (from 1,14 to 1,19), which indicates that the post-results did not range far from the mean when compared to the pre- re-

sults. Consistent with the pre-measurements in goal orientation, seven participants scored below the mean, however, that amount increased to eight in the post measurement. The minimum score in the pre-measurement was 5,73, and the maximum was 10,36. For the post-measurement, these values stood at 6,36 and 10,91 respectively. When looking at the average mean change (,84), only four students scored above it, with three of them having scores below the mean in the pre-measurement. Only one student who scored higher than the mean in the pre-measurement yielded an increase larger than the average, whereas in general the differences in increases is rather big between the ones who scored above the average increase and those below. On the other hand, the ones who reported increases below the mean had rather similar results in observed changes and formed the majority, which somewhat justifies the small increase in the standard deviation. The intervention's impact on the change seems to be strong, with an eta squared of 0,41.

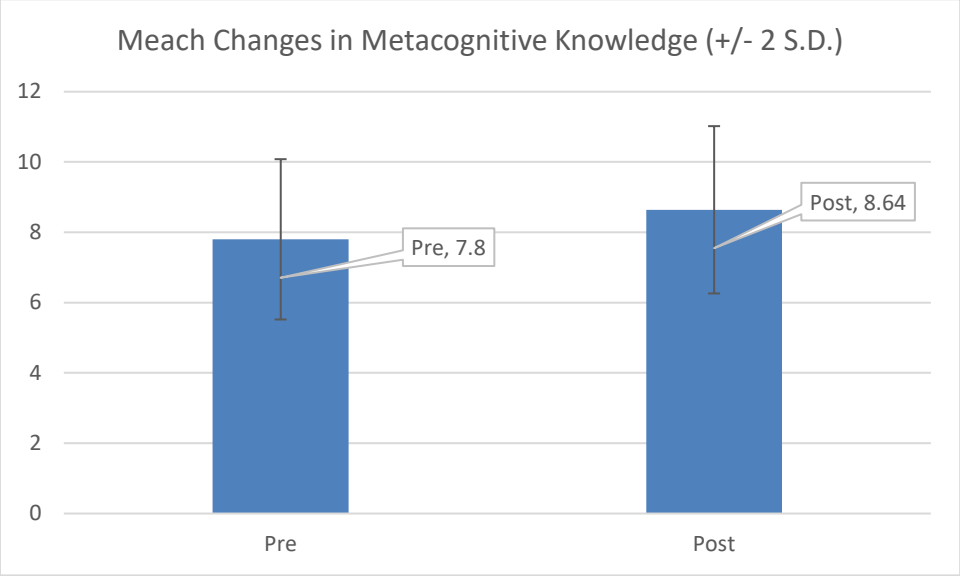

Figure 10. Metacognitive Knowledge

The impact of the intervention on the students' scores with regards to metacognitive experience as measured by the MAC was statistically significant at $p < ,05$. The mean increased from 7,35 to 8,32 as shown in figure 11. The standard deviation increased at a value smaller than goal orientation but greater than metacognitive knowledge. Nonetheless, the heterogeneous effect of the intervention remains as in the previous dimensions. In the pre-measurement, values ranged from 5 to 9,5, with eight of them being below the mean and seven above it. In the post-measurement, those values stood at 4,75 and 10,88 respectively, with six values being below the mean and nine above it. Consequently, when observing the mean changes, nine participants scored higher than the mean (,96), three scored lower, and three had a negative change. Concerning the latter case, it may indi-

cate two things: either the intervention had a negative effect on students' metacognitive experience, there was some error when they were submitting their responses for the second time, I mistyped some of the data when entering them from the learning diary to Microsoft Excel. Given that the SM involves at large student's active participation and sharing of their experiences, which also is evident in the learning diaries (more in 4.2), the negative changes are probably due to some unsystematic error. As for the students who demonstrated an increase higher than the mean, seven of them belonged to the group that scored lower that the mean value for metacognitive experience in the pre-measurement. Once more, it seems that the intervention had a stronger effect on students who scored below the mean, which seems to be a consistent finding so far across the measured variables, whereas the high eta squared (0,45) indicates that the intervention had a strong effect on the observed changes.

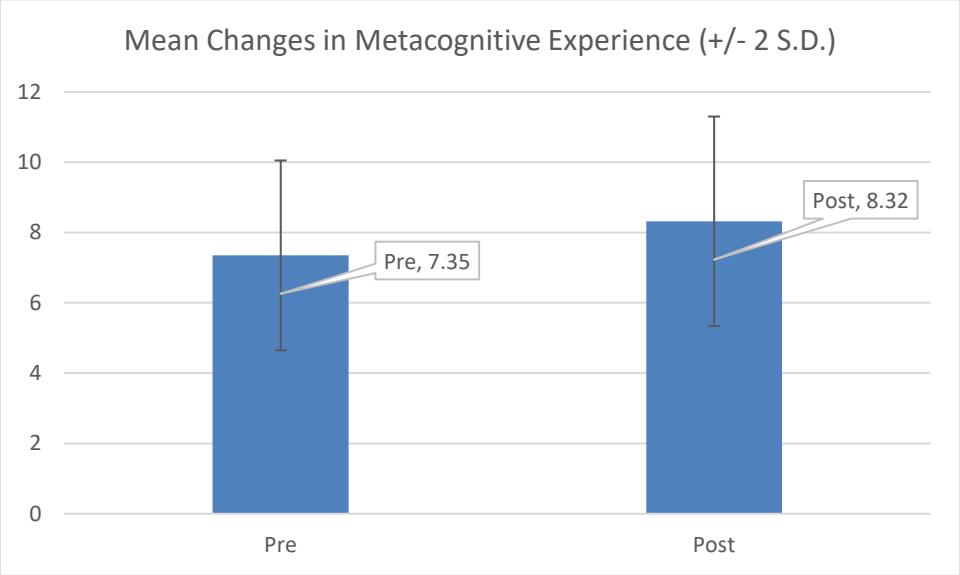

Figure 11. Metacognitive Experience

The impact of the intervention on the students' scores with regards to metacognitive choice as measured by the MAC was statistically significant at $p < ,05$. There was an increase (1,53) in the scores from the pre-measurement (6,77) to the post-measurement (8,30), as well as the standard deviations (from 1,51 to 1,76). The increase in the mean is the highest observed when comparing the six variables that were calculated, indicating that the intervention had the strongest effect on metacognitive choice. The standard deviation increased in a manner similar to goal orientation, however the level of statistical significance differed. Consistent with the findings presented to this point, it seems that the intervention affected the individuals heterogeneously. In the pre-measurement, the minimum value stood at 4,6 and the maximum at 9,4, whereas in the post-measurement those values were 5 and 11. In the pre-measurement, eight students scored below

the mean value, with the remaining scoring above it, whereas in the post-measurement the situation was reversed. Eight students reported an increase in metacognitive choice higher than the average (1,53), with six of them having scores below the mean score in the pre-measurement. Two students who scored higher than the average in the pre-measurement also demonstrated a change higher than the average in the post-measurement, whereas similar to metacognitive experience, three students demonstrated a negative change, although none of the students reporting negative changes matched. This again triggers considerations with regards to why a negative value was observed, with the same reasoning being applicable in the case of metacognitive choice as it was for metacognitive experience. That is, it is more probable that there was some sort of unsystematic error, rather than the student being less capable of utilizing metacognitive choice, although it cannot be said with certainty. There also seems to be a relationship between p-value and the effect size of the intervention. That is, the smaller the p-value, the higher the eta squared. For metacognitive choice, eta squared stood at 0,50, which is higher than the one for the previous three dimensions, all of which had a greater p-value than metacognitive choice. In addition, it seems that students who scored lower in metacognitive choice were the ones who benefited most from the intervention, similar to findings presented concerning the other three dimensions so far.

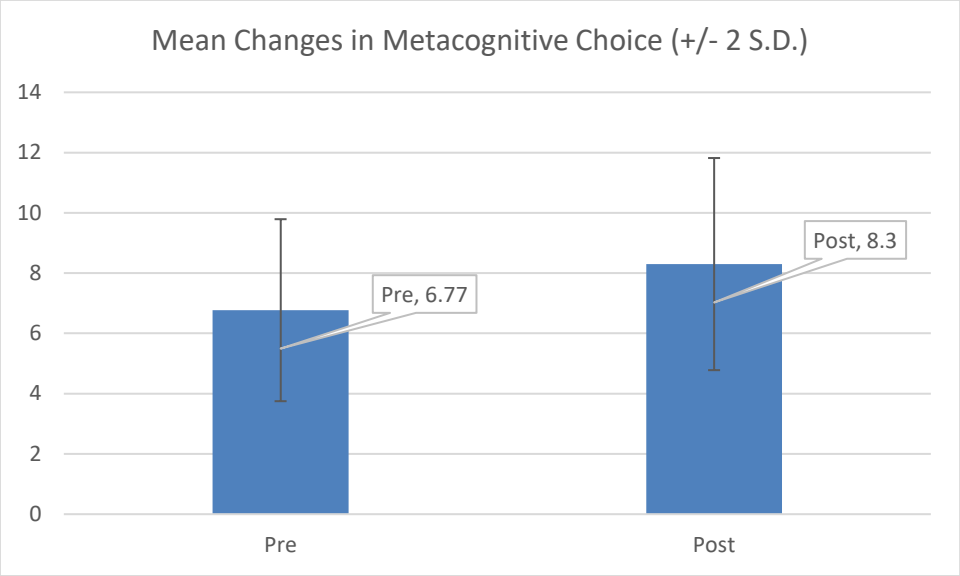

Figure 12. Metacognitive Choice

The impact of the intervention on the students' scores with regards to monitoring as measured by the MAC was statistically significant at p = ,001, which was the lowest p-value when analysing each dimension separately. There was an increase in the scores from the pre-measurement (7,58) to the post-measurement (8,8), as well as the standard deviations (from 1,10 to 1,15). The increase in the mean was

the second largest after metacognitive choice. The change in the standard deviation is value-wise the same as in metacognitive knowledge and is rather small, meaning that the observed changes did not spread out far from the mean after the intervention when compared to the pre-measurements. In the pre-measurement, the minimum score stood at 5,86 and the maximum at 10,71, whereas in the post-measurement those values were 6,29 and 11. Six students had scores higher than the mean in the pre-measurement, and eight students were above the mean in the post-measurement. Overall, nine students demonstrated an increase in monitoring higher than the average, (1,22), with seven of them having scores below the mean score in the pre-measurement. Two students who scored higher than the average in the pre-measurement also demonstrated a change higher than the average in the post-measurement, similar to metacognitive choice, while there were also two students who yielded negative results. Consistent with previous findings, the students with negative results in monitoring did not yield a negative result elsewhere, so there is no clear pattern among certain students postulating that the intervention in general had a negative effect on their metacognition. In addition, it seems that students who scored below the mean before the intervention also demonstrated the biggest increase, with students who had scores higher than the mean in the post-measurement having moderate increases in the post-measurements. The eta squared statistic (0,57) indicated a large effect size, the greatest so far, confirming the assumption that a smaller p-value yields a higher eta squared.

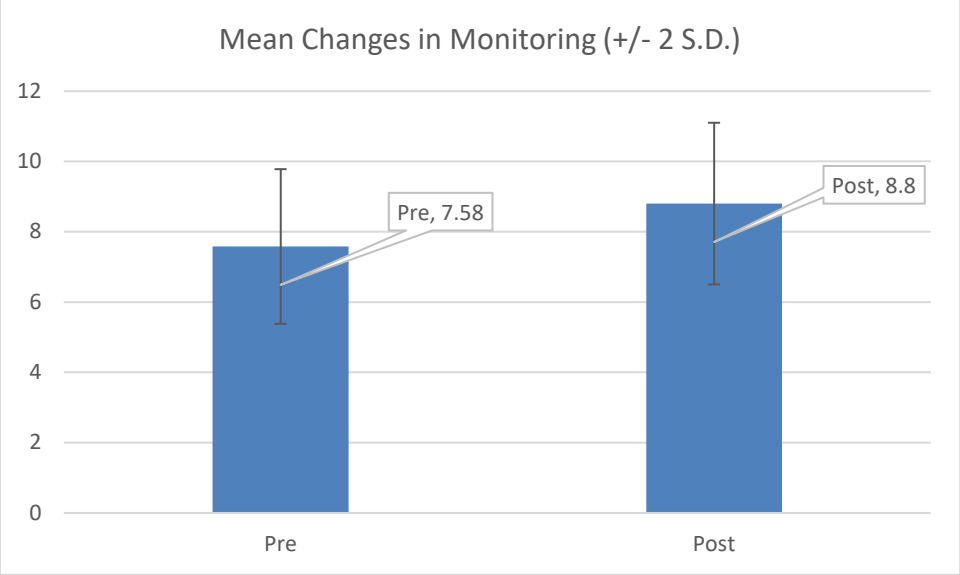

Figure 13. Monitoring

The impact of the intervention on the students' total MAC score was statistically significant at $p < ,001$. The overall increase of the scores stood at 1,06, making a leap from 7,46 in the pre-measurement to 8,52 in the post-measurement. Consistent with all previous findings, standard deviations also saw an increase (from 1,04 to 1,23). When comparing the overall changes in standard deviations, the

ones for the total MAC scored were similar to goal orientation, confirming that students had experienced different changes in their metacognition after the intervention. In the pre-measurement, the minimum values were 5,49 and 10,16 respectively, with those values standing at 6,34 and 10,96 in the post-measurement. Eight students had scored below the mean for the total MAC score in the pre-measurement, with seven students scoring below it. In the post-measurement, only six students scored lower than the mean. When comparing the observed changes in the total MAC scores, seven students had scored higher than the average mean increase (1,06). From those seven, only one participant had a score higher than the mean in the pre-measurement. From the eight participants who did not score an increase higher than the mean, there was an even split of pre-total MAC scores compared to the overall mean. That is, four students had scored lower than the mean in the pre-measurement, and four had scored higher. Two students yielded a negative change, both of whom occurred in a negative result in the variables presented earlier. The eta squared statistic (0,60) was the largest obtained, indicating a strong impact of the intervention on the students' total MAC score.

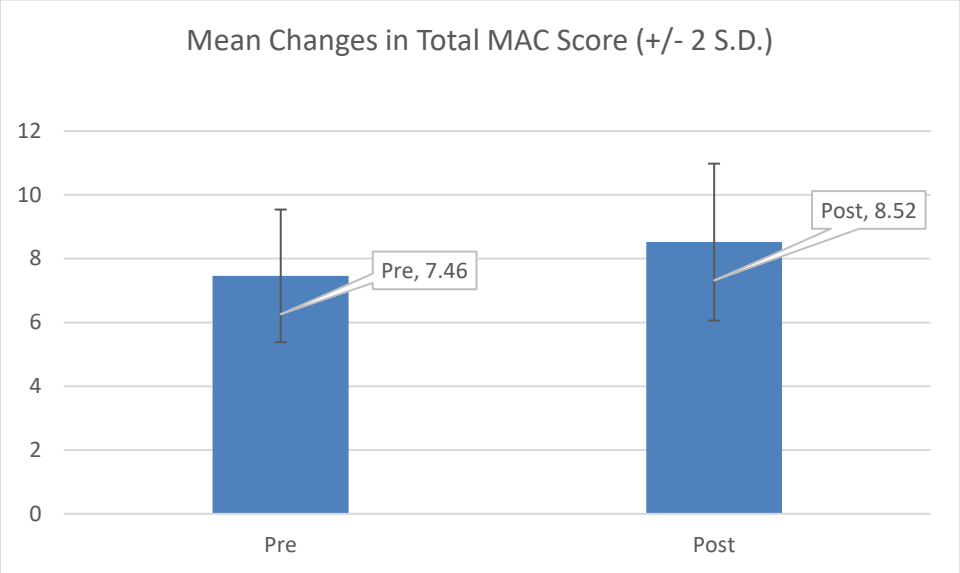

Figure 14. Total MAC Score

4.2 Findings from the Learning Diaries

In this part, the findings from the thematic analysis are presented in four different parts. First, the ways in which the SM motivates students to engage in metacognitive thinking are introduced. Those are split between two main elements of the SM – discussion and questioning. Following that, the value of sharing knowledge

is further broken down to internal and external benefits. The former concern benefits arising from an individual's own thinking process, whereas the latter address benefits brought by the the peers. Then, reflections on the entrepreneurial task that the students had to complete are presented, with findings suggesting that the teams that were formed intentionally applied the SM and utilized metacognition when creating their concepts (see 3.2). Lastly, the findings address whether students have learned metacognition (i.e. has it increased), as well as the possibility that students will employ it intentionally in the future.

4.2.1 Provoking Participants' Interest

The employment of metacognitive thinking by an individual depends a lot on a person's motives as well as the environmental context in which learning takes place. Employing metacognition is a time-consuming process that concerns higher order thinking, and without the interest to do so, it is unlikely that a person will attempt it. Since the SM relies on questioning and discussion, it seems that it has the power to appeal to the participants' interest, which would then encourage the employment of metacognition during learning. Students highlighted both questioning and discussion as being contributors to their interest, while some specific mechanisms being outlined for both.

The SM always begins with a question posed by the facilitator to the students (see 2.7 and 3.2 for details). It opposes the passive nature of the traditional pedagogies where students are given the answers, and since metacognition involves thinking about one's thinking, the SM-based questions can act as the starting point towards triggering one's thinking process with the purpose of reflecting on one's learning. The below extracts highlight how questioning resulted into students thinking independently, how they took pleasure in looking for the answers, and how they prefer active learning against passive. Each quote ends with a parenthesis indicating the student number.

> "It was interesting to think by myself about the topics…" [6]
>
> "We had the chance to think by ourselves about the answers, which is much more interesting than getting them from the teacher." [12]
>
> "The teacher did not give any answers, but instead he was asking us always questions. Before the course I didn't think it will be this interesting." [10]
>
> "We always had to think ourselves about the questions, and because of that it was very interesting and not boring." [1]

> "Answering to questions is better and more interesting than just sitting and writing and listening. You have to think, and that keeps you active." [4]

> "The lecturer didn't impose his opinion, but rather asked us questions and made us think by ourselves. It was interesting to hear multiple answers on the topic." [8]

Following the questions, discussions take place that involve repeated questioning where students normally elaborate their answers. In addition, other students engage in the discussions. As a result, participants were sharing their ideas freely and stayed involved throughout the contact hours. In addition, they felt encouraged by the element of freedom that persisted throughout the intervention. The following were said by the students concerning how discussions raised their level of interest:

> "I liked the discussions because they were very interactive. It was so interesting to listen to others' ideas." [15]

> "It was interesting to discuss with a group of people where everybody can say what they want about the themes." [4]

> "Teaching material by the Socratic Dialogue is very interesting because everyone is involved in the learning process." [11]

> "The discussions were interesting because they offered us the chance to express our ideas." [2]

> "It was interesting that I could discuss and express my thoughts freely without the fear of someone laughing at me." [14]

The SM seems to raise the interest of the participants by engaging them actively into the learning process. This seems to be achieved by enabling them to think independently about what they are learning, and then offering these thoughts for discussion with their peers and the facilitator. Put simply, the SM raises student interest by underlining the importance of the students' own thoughts and thinking process with regards to their learning.

4.2.2 The Value of Sharing Knowledge

In addition to raising the interest of the participants and highlighting the importance of their own thinking processes during learning, it also seems that the

SM contributes to the learning potential of the students by allowing them to develop, express, and receive feedback on their ideas. At the same time the very act of learning seems to be rather pleasant. Students seem to be equally satisfied about the fact that they have expressed their own ideas, as well as hearing and learning new things from others. With metacognition concerning the understanding of what is known and what has been experienced before choosing how to approach a novel task, the SM seems to have the potential for providing participants with a wider spectrum of knowledge and experiences from which they can channel information when engaged in the process of learning. This is done by first allowing them to express their original ideas, and then potentially develop them when their peers get involved in the discussion. The quotes below concern extracts where participants underline the value of expressing their own thoughts.

> "Watching the development of my thoughts during the discussions was very nice, I liked it very much." [3]
>
> "By answering to questions and discussing, we develop our opinions and thoughts, that was really very helpful and useful." [6]
>
> "Discussions are a very good idea, because we learn how to develop and then share our thoughts. I really enjoyed doing that." [7]
>
> "It was important for me to share my personal stories when reflecting on the material. I've never done this before." [2]
>
> "I like the discussions because they gave me the chance to express my opinions and share my ideas freely." [12]
>
> "Bringing examples from our life made it easier to understand the themes." [14]
>
> "I love the work we had in class because it was lovely and memorable, every person could tell their thoughts and feelings that were linked to the topics." [15]

As much as students enjoyed sharing their own knowledge and experiences, they had similar feelings about their peers, highlighting the learning potential that listening to others brings, as well as its effect on triggering reflection on one's own thoughts. The extracts below shed light on what the students think about peer learning.

> "Even if I cannot answer a question, it's possible to listen to answers of other students and learn new information." [2]
>
> "I learned a lot by listening to the life experiences of other students." [9]
>
> "The main thing in the Socratic Dialogue is that the communication can help to analyze information." [8]
>
> "I saw how different themes we studied relate to people's lives. It's important because you do not just study some information but listen and learn from others." [15]
>
> "There are no 'correct' or 'incorrect' answers to some questions. It's just a matter of a specific opinion, so the more opinions you know, the closer you are to the truth." [5]
>
> "I understand why we learn more information with discussions. Because in this way we can listen to our peers, find different points of view, and practice critical thinking." [1]
>
> "You must communicate your thoughts and get feedback from others. That way you probably improve what you originally had in mind." [6]

The findings point towards dividing the value of sharing knowledge into two categories: the one concerning value brought by the individuals themselves, and the other value brought by their peers. In the first case, participants seem to take pleasure in seeing how their original ideas develop during the process of discussion, and in addition, it seems that the sharing of personal stories relevant to the contents studied also enable better learning outcomes. In the case of value brought by peers, those include vicarious learning (i.e. learning something that has not been experienced), as well as reflection on one's ideas. Students underlined that they were able to learn new things simply by listening to the stories of their peers, while at the same time diverse ideas on a matter enable individuals to reflect on their own ideas. These elements reflect on metacognition in several ways. On one hand, students learn to utilize their knowledge and experience when they learn, which is essential for mastering the skill of metacognition, and on the other, the ideas of their peers enable students to increase the pool of available knowledge and experience which enables them to be self-reflective and allows for a broader sample of alternative approaches to choose from.

4.2.3 The Entrepreneurial Context

In the last session, the students were given the task of coming up with an entrepreneurial idea of their own (see 3.2 for details of the intervention). They were divided into three groups of 5 and had to come up with and present their concept

to the rest of the class. It is evident from their entries that they had utilized the SM during their groupwork, without being asked to do so, while at the same time the metacognitive nature of the SM is also present with regards to how it relates to a novel task that requires something creative to be the end result. More specifically, it seems that the SM appeals to the five dimensions comprising the MAC through its two main elements: questioning and discussion. Questioning allows to better clarify goals, and much of that will be based on the learner's motives and interest. Furthermore, discussions trigger students' metacognitive knowledge and experience that eventually lead the students to make the best choice out of the presented alternatives. In the end, students evaluate their choice with regards to the original goal to address any potential flaws. Below are several examples where the students have summarized their groupwork activity. None of three students quoted below belonged to the same group, thus their summaries can be considered representative of each of the three groups:

> "First we had to define a problem and then ask questions to think about what caused it. Then, we would discuss possible solutions and implementations for the problem and each person had to express their ideas and share their knowledge. What was extremely important - we had to communicate during the whole process, to be ready to provide arguments for our ideas and to agree or disagree with the ideas of others. In the end, we had to evaluate our groupwork by asking questions that allowed as to develop the project immediately, to discover new perspectives and to detect possible risks." [2]

> "We started with questions in order to clarify what the problem in the area is (conservation of the environment), and then we analyzed our knowledge and looked at the problem from different sides. This made us think about more details that we could not think of if we were alone, and we also had to explain our ideas to our groupmates which made us think deeper. In the end, we also learned to predict some possible questions that we will be asked, because we had only 10 minutes for our presentation." [12]

> "In the group task we used the Socratic Dialogue for the first time outside the classroom, asking each other questions and through dialogues and critical thinking came to the answers. The task gave us an opportunity to try and create something by first asking 'Why' when creating our project. This was a good practice of having clear goals when you want to do something. Then we had to analyze and evaluate all our knowledge on the topic, and it was good to answer uncomfortable questions during the discussion, because they helped us improve immediately. Communicating with others is very important because you share your thoughts and get feedback from their thoughts, so then you have more knowledge and make the best

> choice. In the end, I think we did well, because we managed to answer the question we originally asked in our team." [12]

According to the students, their teams had defined their goal at the very beginning by asking questions. Although this may sound obvious, having clear goals when engaged in the learning process is a metacognitive skill that requires higher order thinking and serves to inform the employment of metacognitive knowledge and experiences. The 'thinking about thinking' process becomes evident when the students talk about the discussions that took place during the groupwork. More specifically, it seems that in all three groups, participants had to justify and provide arguments for their ideas to their peers and think thoroughly about what they were saying. This process is metacognitive in nature, because the students had to think in advance why they are expressing certain ideas and how can they reason them. In addition, the multiple viewpoints contributed in several ways to the creation of their projects. First, they provided a wider pool of ideas from which they could choose, which ensured that they had not missed something. This is characteristic for metacognitive choice, where the best alternative is chosen out of a set of multiple options. Second, multiple options acted as the 'devil's advocate' by making the teams think about questions that might be raised towards them after the presentations, thus allowing them to further develop their ideas before they present them. This in turn reflects monitoring, where the students looked for feedback to reevaluate their choice. What is important from these findings is that the students had intentionally and systematically employed the SM and utilized metacognition for their projects. This in turn results to the following consideration – will students employ metacognition in the future, or did it occur only in this course because of the way it was implemented?

4.2.4 Socrates Beyond the Classroom

To answer the question posed in the end of the previous paragraph, the findings from the learning diaries predict that they will, whereas the reasons behind that lie within asking questions about oneself, as well as employing critical thinking, both being the cornerstones of the SM. The extracts below present the intentions of students to ask questions and engage in intentional metacognitive thinking in the process of learning.

> "My thinking became deeper and I began to answer questions I ask myself. This will help me a lot in my personal development because now I can and will analyze and evaluate what I am learning." [11]

> "I started asking myself questions even after the course ended, and then try to answer them. I think that I have made a step forward to understanding who I am and what I want to do." [14]

> "It will be easier for me to establish priorities correctly in the future just by asking myself 'Why?' 'What did I learn?' 'Was it useful for me?' I believe this is the best way to analyze my experience, my knowledge, and my emotions." [12]
>
> "I think that now I feel the need to analyze and evaluate everything I learn. It is really worth thinking about my experiences, my learning, and my goals, as it can help me to choose the correct path." [11]
>
> "In the future when I have a problem, I will ask myself one question: 'Why can't I do it?'. Then I will start thinking about what caused the problem and try to change the situation." [3]
>
> "It is really helpful when solving problems or setting a goal to ask questions and think about a wide range of aspects. "[4]
>
> "I have learned which questions I will have to ask myself (like who I am, what am I doing and why, are there different ways to do it etc.)." [2]
>
> "I suppose it's important to ask the right questions and answering them. And now I know a little bit more which questions I have to ask from myself." [6]

As stated in the pre-conceptual summary (2.8), one could think of the SM as the practical application of metacognition via its format. As students engage in Socratic discussions, they seem to understand the value of their own thoughts and ideas with regards to their learning. Because of that, they start thinking independently not only about the course contents, but also their own learning process, eventually reaching the point where they begin to intentionally question, analyze and evaluate what and how they are learning. This is achieved by self-inquiry that stimulates critical thinking. In the end, it is hard to assume anyone thinking about their thinking process without first questioning it. Consequently, once the question is posed, the individual will start analyzing and evaluating the learning process, which could be rephrased as self-discussion. And so, the dynamics between the SM and metacognition can be reasoned as follows. Within the classroom, the facilitator is the one who poses the question and enables the students to think, and then the discussions enable the analysis and evaluation of the content, as well as the learning process itself. However, when the students understand the value in doing so, they proceed with becoming the facilitator and interlocutor all at once when they employ metacognition to deal with a novel task, and in particular, one that requires the creation of something new.

5 Discussion of the Findings

This study had two purposes: the first was to see whether an SM-based intervention will increase student metacognition within an entrepreneurial classroom, and the second was to understand the mechanisms in which the SM contributes to said increase. Respectively, to address the first, a quantitative instrument (MAC) developed by Haynie et al. (2009) was used to measure participants' metacognition before and after the intervention. To the best of my knowledge, this was the second time the MAC was used to assess changes in student metacognition as an outcome of an entrepreneurial course, with the first being the study of Ling et al. (2013). For the second purpose, qualitative evidence was obtained from the students' learning diaries to find evidence where students reflect on the SM as being the facilitator of their metacognition. This triangulation process follows the complexity of measuring and assessing metacognition (Akturk et al., 2011; Schraw, 2009), and this chapter discusses the presented findings with regards to the research purpose set in the introduction. First, the MAC measurements and the t-test are addressed, followed by what the learning diaries are telling us concerning the possible causes behind the MAC measures. Then, the study is scrutinized through the lenses of reliability and validity before turning to the conclusion chapter which includes the strengths and limitations, as well as the practical implications.

5.1 Measuring Metacognition

The quantitative results obtained from the MAC instrument and the consequent analysis via the means of a t-test allow for several interpretations to be made. On average, the findings suggest that the SM-based intervention had moderately increased participants' metacognition as measured by the five dimensions of the MAC. The moderate increase is consistent with Ling's et al. (2013) study, despite significant differences in the design of their intervention and mine in terms of length, course content, and level of statistical analysis. Nonetheless, the findings support the notion that entrepreneurial-centered interventions that aim at increasing metacognition have potential (Ling et al., 2013; Neck et al., 2011). In the case of the present study, different dimensions of metacognition have shown diverse results. Apart from goal orientation, the mean changes for the remaining four dimensions were statistically significant at $p < ,05$ and demonstrated an increase when comparing the pre- and post-measurements. This may indicate that the course format and contents did not particularly affect students' predisposition into setting goals if we choose to trust the instrument (more in 5.1.3). On the other hand, metacognitive choice and monitoring demonstrated the highest increase which was also found to be statistically significant, which might indicate

that the SM, which relies on critical thinking, helps students to consider the analysis and evaluation of a chosen strategy when approaching a novel task, as well as to monitor the chosen alternative. Lastly, metacognitive knowledge and experience confirmed their close interrelation by having identical scores in the pre-measurement, with almost the same happening in the post-measurement. This relationship further proves that one´s own knowledge and experience work together to inform learning strategies and play an important role. Overall, the findings reject the null hypothesis, and consequently the assumption that the intervention had no effect at all can be rejected. In addition, the eta-squared that addresses the effect size of the intervention with regards to each variable was above the accepted norm, indicating that whatever changes occurred, they did because of the intervention.

Furthermore, as much as the intervention had a heterogeneous impact on the dimensions, it did the same to the participants. Participants who scored below the mean values in the pre-measurement seemed to have gained more from the intervention than their counterparts. In most of the cases, the former were the ones who had reported the biggest change, although there were cases where participants who reported scores higher than the means in the pre-measurement also reported increases greater than the average after the intervention. On the other hand, students whose scores were higher or roughly equal to the means in the pre-measurement did not seem to report increases of similar magnitude as their peers with lower scores in the pre-measurement, although in some cases they were above the average increases. Lastly, there have been some negative effects, which may be either due to some unsystematic error, or indeed an outcome of the intervention, although the findings from the learning diaries contradict the latter.

5.2 The SM as a Tool to Facilitate Metacognition

Learning diaries, or qualitative methods in general, are better suited for assessing student metacognition (Akturk et al., 2011). That happens for the simple reason that the learning diaries give students the chance to elaborate their answers, or in other words, demonstrate their thinking process. Quantitative instruments, on the other hand, cannot provide the richness of thought that we seek when looking for metacognition. However, the primary objective of the qualitative analysis was not to detect metacognition being applied to a specific learning task by the students, but rather find evidence that the SM has contributed to its development. When turning to the learning diaries, I was able to find evidence in the students´ writings that would partially support and explain the results obtained from the MAC, and thus answer the question concerning the specific mechanisms in

which the SM contributes to the development of metacognition in an entrepreneurial classroom. And while the small sample size cannot possibly account for all said mechanisms, it nonetheless highlights some.

For a person to engage in metacognitive thinking during learning, the environment in which the learning occurs must provide the necessary motivation and context to the learner (Haynie et al., 2009). Those precede goal orientation, which the authors of the MAC believe to be the starting point of metacognition. Although the changes in goal orientation were not statistically significant, the diaries highlighted an issue related to goal orientation – interest. It is hard to believe that a person will consciously engage in 'thinking about thinking' without being interested in the novel task. Respectively, the findings from the learning diaries confirm SM's capability in maintaining student interest (Gose, 2009) via its question-discussion method. Said interest stems from both individual and group factors, because as much as participants were interested in being active and having the chance to find answers to questions by themselves, they also expressed the desire to share those answers with their peers through the discussions. In turn, whereas the SM manages to draw interest towards the content, it also seems to raise student interest with regards to themselves. That is, students seem to be more willing to intentionally and systematically explore their own knowledge and ideas to construct their learning, which may not be the case in traditional classrooms where the focus is on delivering what needs to be learned, rather than how. This is well in line with Piaget's cognitive constructivism, which underlines the unique experiences of each learner as crucial for learning to occur.

Consequently, the next stage where SM contributes to the development of metacognition takes place when students begin to investigate their possessed knowledge and experience and following that, they share them with the peers and the facilitator. Metacognitive knowledge and experience work together to provide the best alternative to the learner when approaching a novel task, which eventually leads to the metacognitive choice. The extent of the former two highly moderate the pool of alternatives that will be generated, as well as the act of choosing one, and the SM demonstrates a double mechanism with regards to these three dimensions. First, it enables the students to figure out what they know and do not as they offer their ideas for discussion. The very act of seeking what is known and what has been experienced is metacognitive, yet the benefits of the SM stretch beyond that. Once students express their metacognitive knowledge and experiences, they are further challenged by ongoing discussions, thus making students to develop their original ideas by considering aspects they did not prior to discussing them with the class. In addition, a second mechanism derives when the students observe answers given by others. As presented in 4.2.2, as much as the discussions allow students to improve their individual ideas, they are also enabling students to learn from their peers, thus increasing the pool of metacognitive knowledge and experiences, from which a metacognitive choice

will be made. Respectively, these findings support Vygotsky's social constructivism, highlighting the mediating role that human interactions play with regards to learning.

Lastly, the findings from the entries concerning the entrepreneurial task that was given have confirmed the metacognitive nature of the SM with regards to how students monitor their progress as they are dealing with a task, after they have set the goal, discussed their knowledge and experiences, and made a choice out of a set of alternatives . In the end, metacognition concerns how a learner will approach a task. Only one such task was given at the end of the course, with the essence of it being rather simple – create your own entrepreneurial idea. It is evident from the entries concerning the task that the students intentionally utilized the SM including both its elements – questioning and discussion, when generating their ideas, while there is also preliminary evidence that could possibly indicate whether one of those elements appeal more to a particular dimension. For example, it could be that questions concern more goal orientation and monitoring (which are interrelated), whereas discussions concern more metacognitive knowledge, experience, and choice. However, this is yet to be confirmed in future studies. Furthermore, questions are also part of the discussion, so there may be no systematic way of utilizing the SM. Instead, questions lead to discussions that lead to further questions, so the SM follows a cyclical manner, rather than a hierarchical one. What is equally important is that the students seem to have understood the use of metacognitive thinking and were able to apply it, despite the short duration of the course.

In general, it seems that calls for integrating Socratean techniques within entrepreneurial classrooms (Hindle, 2007; Neck et al., 2011) are justified, and this intervention may have highlighted two reasons supporting said calls. The first lies with the SM's potential to increase student metacognition, which seems to be playing an important role in the possession of an entrepreneurial mindset (Haynie et al., 2010). Some scholars even claim that enhancing metacognition equals to enhancing said mindset (Mitchell et al., 2008), whereas others propose the evaluation of entrepreneurship programmes to be based on changes in metacognition (Venesaar et al., 2011). It is true that the changes as measured by the MAC were rather moderate, but nonetheless, students' metacognition did increase. In addition, the findings from the learning diaries discussed in this part open up the specific mechanisms in which the SM may contribute to metacognition, which enables the further development of constructivist pedagogies that aim at enhancing student metacognition, in particularly within an entrepreneurial classroom (more in the conclusion chapter). Another, perhaps important finding lies within the students' intentional use of metacognition when they were working on their startup idea, which practically stemmed from using the SM, This in turn opens the discussion for explicitly using the SM when engaged in novel tasks that demand creativity. The learning diaries were able to show (at least partially) how students were thinking and acting when dealing with their

task. This certainly looks promising, although directly observing the groupworks (which was not done) would probably shed more light on the process. Nonetheless, it seems that as much as SM contributes to the increase of metacognition, it also seems to be a tool for employing it, especially in tasks requiring creativity, which are common in classes that aim at teaching entrepreneurship.

5.3 Thoughts on Reliability & Validity

Research is normally approached through the lenses of reliability and validity. The former concerns the replicability of the study, whereas the latter concerns the extent to which the research design accurately studies the phenomenon that is being investigated (Bryman & Bell, 2003, pp. 287-288). As this study involved mixed methods by collecting both quantitative (MAC measures) and qualitative (learning diaries) data to answer the research question, the trustworthiness can be assessed by addressing each method separately, yet keeping in mind to what extend they complement each other and eliminate possible deficiencies (Zohrabi, 2013).

First, some thoughts must be given to the measurements obtained by the MAC. As expressed in 3.3.1, it was not meaningful to conduct a factor analysis due to the small sample size, however the reliability of the instrument was checked with Cronbach's alpha as it was done by the creators of the instrument (Haynie et al., 2009). Although in the pre-measurement the alphas did not reach the norm (DeVellis, 2012, pp. 109-110), they did so in the post-measurement. The low alphas in the pre-measurement may be caused also by the small sample size (Palland, 2011, p. 97), since each participant's reply to the instrument has greater weight on the measurements the smaller the sample is. On the other hand, the results for Cronbach's alpha differed significantly in the post-measurement, with all variables exceeding the acceptable norm of 0,7. This positive change can be attributed to several reasons, including the students' mastery of metacognition and the better understanding of the instrument itself.

To the best of my knowledge, the MAC has been used only once in the past for the same purpose as it was in the present study (i.e. Ling et al., 2013), whereas in another study by García, Boada-Grau, Prizmic-Kuzmica, & Hernández-Sánchez, 2014, the 5-dimension model of Haynie et al. (2009) was not confirmed. Furthermore, in another study (Ling et al., 2015), the MAC was reduced to a 4-dimension model and called measure of metacognitive awareness, although the authors did use the MAC to develop their own measure. In the case of the present study, I did not make any changes but rather distributed the instrument in its original form, as well as language, and followed the instructions of the creators with regards to its administration. In addition, the five dimensions of metacognition seemed to correlate well (see 4.1.1), which informs us about the presence of a

positive, linear relationship between the dimensions. The t-test that was applied had several purposes with regards to the present study. The first was to reject the null hypothesis that would indicate that the intervention had no effect at all (Weber, 2009). Second, assuming that the null hypothesis is rejected, the study aimed at finding whether the course lead to a change in students' self-reported metacognition as measured by the MAC when comparing the pre and post measurements. The findings indicate that for all five dimensions as expressed in the MAC, on average student metacognition did increase, whereas the difference was not statistically significant only for goal orientation, although it almost reached the accepted norm ($p < 0,51$). In addition, the effect size of the intervention was addressed by calculating the eta squared, thus answering the question regarding the role of the intervention with regards to the changes. Respectively, the effect size proved to be way above the perceived norm of 0,14 (Cohen, 1988, pp. 284-287). While it can be speculated that there is bias in the results due to the demand effect where students give higher scores in the post-measurements because they believe that they are expected to do so (Zizzo, 2010), such comparative measurements are common (Morris et al., 2013) and have been implemented within the context of enhancing metacognition through EE (Ling et al., 2015; Ling et al., 2013).

Overall, the MAC measurements and the t-test provide satisfactory results that point towards the conclusion that an intervention in the form of the SM as implemented in this study does increase participants' metacognition as measured by the MAC when comparing pre and post measurements, with reliability indicators being acceptable, however not ideal. The small sample size, the presence of the demand effect, as well as the choice of instrument may have affected the results. Lastly, even though reliability has been addressed in the analysis, that is not the case for the validity with regards to the results obtained by the MAC. That being said, it would be hard to generalize said results beyond the present study, however its purpose at this point was to examine the potential use of the SM for increasing metacognition, rather than to generalize the findings and prove superiority, for example over other instructional methods. Nonetheless, considerations of validity would add to the trustworthiness of the study, and potential improvements to the present design will be addressed in the conclusion chapter.

Contrary to quantitative research, the means for assessing the trustworthiness of qualitative research differ, as reliability and validity are more convenient in the case of the former (Bryman et al., 2003, pp. 286-288). Reliability would hold that it is possible to replicate the study, however qualitative research may not as such be replicable entirely, because it is bound to the subjective reality of both the sample that generated the data, as well as possible biases from the researcher´s point of view (Greenbank, 2003). The purpose of qualitative research is to explore and increase the understanding of what is being studied, contrary to the quantifiable and statistical procedures of quantitative research, thus replicability may be hard to achieve in qualitative research, and neither is it its prime concern (Stenbacka,

2001). On the other hand, the issue of validity has two sides in qualitative research that can be addressed via internal and external validity. The former concerns the extent to which the findings support and are in line with the theoretical underpinning of the study. Qualitative data allow for an in-depth analysis that enables the development of ideas after careful consideration, thus adding credibility to the conclusion that will be made. However, external validity that concerns generalization in different social settings is considered indeed problematic in qualitative research, as findings tend to be bound to the specific cases under investigation (Bryman et al., 2003, p. 288).

Even though reliability and validity may not be applicable signs of quality in qualitative research, credibility and trustworthiness are (Golafshani, 2003). Much of them is believed to be arriving from the researchers involved in qualitative methods, and their degree stems from the ability and effort of the researcher. With the purpose of the qualitative analysis being to reveal the possible mechanisms in which the SM contributes the dimensions of metacognition, I took the task of interpreting the subjective views expressed by the participants and trying to identify said mechanisms. It is important to keep in mind that this process already is affected by my own biases and interpretations of the students' writings. Nonetheless, I have tried to increase the credibility and trustworthiness of the qualitative analysis in several ways. Firstly, no question within the learning diary (see appendix 2 for all questions) was specifically asking the students to reflect on the SM or its contributions to the process of learning. That is, students have chosen themselves to do so, because they have clearly identified its benefits. In turn, many of those benefits are in line with what the literature review has suggested concerning both constructivist pedagogies, as well as benefits brought into the classroom by the SM (see 2.5; 2.7). Second, and as explained earlier in this thesis (3.4.2), I had eliminated from my analysis all content-specific extracts, as my focus was on the SM. This in turn eliminates partially the notion that anything goes when conducting thematic analysis given its flexibility when interpreting data (Braun et al., 2006). Focusing on the SM gave me the chance to go deeper into its possible contributions with regards to the dimensions of metacognition, keeping in mind the very definition of said dimensions, the definition of metacognition, and the MAC items. When conducting the analysis, I was going back and forth between the qualitative material and what was written in the literature review chapter to receive confirmation or rejection of a finding that I had generated. Furthermore, I have tried to thoroughly report the procedures that took place throughout my study: from describing the intervention to the methods of collecting and analyzing the data.

Finally, as much as each research method has been addressed individually, one also must keep in mind the process of triangulation, which aims at addressing whatever flaws are present in one method and attempt to reduce them through the findings of the other. For example, if only the MAC measurements would have been obtained, there could be speculation whether the increases were

caused because of the intervention or something else, despite a satisfactory eta squared that indicates that the changes in the measurements were in fact caused by the intervention. Nonetheless, the learning diaries provided the possibility to address two issues related to the MAC. First, as much as students reflected on what they have learned, they also reflected on how they were learning, although there were no direct questions nor hints in the learning diary questions asking them to do so. Indeed, reflection and understanding of one's learning process is a cornerstone of metacognition (Schraw et al., 1994), and students demonstrated that in their diaries. Second, that very reflection on how they were learning allowed to establish several specific mechanisms in which the SM contributes to increasing metacognition, although this needs further development at the methodological level in order to have a better picture. Nonetheless, the learning diaries partially support the results obtained by the MAC. Similarly, had I only collected only the students' learning diaries, there could be evidence that students had become more metacognitive, but it would be difficult to quantify said increase, or address the specific mechanisms with regards to the dimensions of metacognition. Having the five dimensions from the MAC allowed for better interpretation of the learning diaries, as they allowed to draw links between what happens within the classroom and how that relates to increasing metacognition. As this was a pilot study where the SM was used to increase metacognition within an entrepreneurial classroom, the triangulation process seemed reasonable, with the results obtained answering to a satisfactory extent the question posed in the introduction.

6 Conclusions

Socrates claimed that the "unexamined life is not worth living". Indeed, by taking a look today at how we have conceptualized entrepreneurship and metacognition, one could say that the former concerns the examination of the surrounding world with the purpose of making it better through consistent innovations, while the latter concerns the examination of one's self with the purpose of continuous self-development. Even though metacognition is a general cognitive skill, its importance in entrepreneurship becomes of increasing weight, as it forms the foundation of an entrepreneurial mindset by enabling a person to analyze, evaluate, and consequently create something. This happens because a person that utilizes metacognition is able to take control of their own learning process and focus their efforts not only on what they learn, but how they do it as well. In the past, entrepreneurial cognitions have been ignored within the context of EE, but lately there have been attempts at integrating metacognition within entrepreneurial classrooms, with the results being promising. This study was another such attempt. However, I tried to place an emphasis on the choice of the instructional method when considering the very nature of metacognition, as well as our understanding of entrepreneurship. The former is closely related to critical thinking, whereas the latter considers creativity as being essential to it. Having those two in mind, I chose to build a constructivist approach around the intervention, since I consider it to be more effective for the task at hand when weighted against behaviorism and cognitivism. Based on the triangulation results that involved a quantitative assessment of metacognition as well as students' learning diaries, it can be argued that there is potential in designing constructivist classrooms for teaching metacognition within the context of EE, whether one chooses the SM or some other method. In this chapter, I will address the overall strengths and limitations of the study and provide some implications that it bares with regards to research as well as teaching.

6.1 Strengths & Limitations

There has been a call for choosing constructivist methods within classrooms that teach entrepreneurship (Huq et al., 2017), and at the same time scholars recommend the integration of metacognition into EE curricula (Ling et al., 2015). Respectively, this study has addressed both calls by using the SM to increase student metacognition within the context of EE. At a first glance, from a purely quantitative perspective it can be said that the intervention has achieved its goal – that is, student metacognition on average had increased, although the intervention's effect on the students was rather heterogeneous, with some having greater gains than others. Although the reliability of the MAC measures could be better,

findings from the learning diaries allow to conclude that the students' did see the value in 'thinking about one's thinking' and were able to apply it in an entrepreneurial context when engaged in a task that required creativity. Furthermore, the learning diaries allowed to discover some specific mechanisms in which the SM contributes to metacognition. Conceptually, there was evidence that the SM will lead to an increase in metacognition because the former aims at triggering students' critical thinking, whereas the latter is closely related to it. In the end, it cannot be accidental that some believe Socrates to be the first one who systematically employed metacognition (Tanner, 2012). Therefore, as much as the choice of the SM for the task at hand was justified after the literature review, the findings provide further support for using similar pedagogies in the future when the purpose is to increase metacognition (more in 6.2). In general, Socratean techniques have been advised in the past for entrepreneurship educators (Carrier, 2007), with scholars claiming that they should form the cornerstone of entrepreneurship curricula (Neck et al., 2018). I think of this study as contributing to the potential of using the SM within the entrepreneurial classroom, as I could not find studies that were mentioning explicitly the application of the SM within an entrepreneurship classroom. In addition, since the main goal was to see an increase in metacognition as an outcome of the course, I have actually described, to the best of my capabilities, the way the course was implemented (see 3.3.3), thus making its implementation elsewhere easier. In addition to the specific ways in which the SM contributed to the increase of metacognition, other benefits arising from a constructivist approach were highlighted in this study. Having a constructivist classroom in place seems to be granting significant pleasure to the students with regards to their learning process. Almost every student openly highlighted the pleasure they took in being able to speak their mind during the classes as an outcome of the dialogue-based approach that the SM adheres to. In addition, they were particularly interested to not only answer to questions posed by the facilitator, but also discuss between themselves. That, I believe, is the ultimate purpose of a facilitator within a constructivist classroom – to enable students to discuss and consequently construct their learning.

Furthermore, the benefit of teaching metacognition in entrepreneurship classrooms became evident when the students were working on their creative task at the end of the course. That is, having understood what it means and where it comes from, students were eager and willing to apply it systematically when generating their creative ideas. In addition, the students had expressed their willingness in utilizing the SM and metacognition in the future, which signals the intention to reflect more on their learning process. This is a rather important outcome, because students need to clearly understand metacognition if they are to utilize it (Pihie et al., 2013). And if we are eager in having our students generate innovative ideas that would benefit the society, we cannot skip the cognitive processes of analysis and evaluation when asking them to be creative. Instead, we should rather emphasize those so that they understand that creativity resides within their minds and not outside of them.

On the other hand, this study, as any other, does not come without limitations. Case study research may not be the most suitable for generalization (Stake, 1995, p. 7), and in the case of this study it may be even harder to do so, because there was no validity evidence with regards to the MAC measurements, whereas the findings from the learning diaries may not be a priori generalizable as they are bound to the specific social context in which the intervention took place. The sample size (n = 15) limited the possibility for conducting a meaningful factor analysis on the MAC which would address the quality of the instrument. There is evidence from other studies that suggests that the instrument may yield different factor loadings (Ling et al., 2013; García et al., 2014), which raises the question of whether the instrument is capable of measuring what it claims to. This then leads to the question of whether it is even possible to design an instrument that will objectively measure metacognition? According to Akturk et al. (2011), the answer is no, because metacognition is not something that as such can be measured quantitively, because it is an internal mental process, and that poses certain challenges for measuring it. How can we understand how students are thinking about how they think by looking at numbers? That is perhaps the reason why qualitative techniques are favored when studying metacognition, as they enable participants to gain reflection and self-awareness (Colbourne & Sque, 2005), qualities that are essential to metacognition.

Another limitation concerns the absence of a control group (Singleton, Straits, & Straits, 2010, p. 124) that would address the question of whether increases in metacognition as measured by the MAC can be obtained also without the application of the SM, but rather traditional pedagogies that resemble mostly behaviorist or cognitivist practices. The same course contents would need to be facilitated with a different pedagogical approach from the SM, and then the pre and post measurements would have to be compared and cross-checked with the students' learning diaries. This might inform us about which method is more suitable for enhancing student metacognition. There is also one limitation that comes from the design of the intervention itself. Metacognition normally relates to completing tasks, however only one task was given to the students throughout the course where they could explicitly apply metacognition. It is true that while covering the course contents, metacognition was being enhanced indirectly, however its real application comes from working on tasks. Having more tasks would probably give them more time to practice metacognition directly, and that would have probably generated more qualitative material that could be analyzed, and better conclusions could have been made from that material. Furthermore, although student accounts confirm the use of metacognition when engaged in their creative task (see 4.2.3), it would have been better from a research point of view to observe and record the groupworks, and then watch the recordings to better interpret the applicability of metacognition in an entrepreneurial task. This could of course have negative effects on the students as they may have been stressed from the fact that they are recorded, as well as the presence of the teacher. And

so, although from a teaching point of view it was better to let them work by themselves, from a research point of view it would add value to the qualitative material to observe and record the groupworks.

6.2 Implications for Teaching & Research in EE

This study has generated several implications for teaching and research that go side-by-side, because research generated on the topic comes directly from the classroom. Theoretical propositions that are not applied within classrooms, and vice versa, classroom practices that are not based on theory may not be as valuable as a combination of both when instructing metacognition within an entrepreneurial classroom. Educators in the field of entrepreneurship must include and plan for the development of metacognition within their classrooms, regardless of the course contents or duration. Since there is evidence that metacognition forms the foundation on which creativity is built, which is what we believe to be the central aspect of entrepreneurial activity, I firmly believe that it should become somewhat of a standard, as also suggested by Venesaar et al. (2011). Metacognition is defined as 'thinking about thinking' (Paul, 1990, p. 32) and assumes the intentional reflection upon and control of one's learning process (Schraw et al., 1994) therefore when integrating it into EE curricula, we must consider the following three questions:

1) How do we create classroom environments that facilitate the development of metacognition?
2) How do we enable our students to apply their metacognition within entrepreneurial classrooms?
3) How do we measure and assess changes in metacognition?

6.2.1 Facilitating Metacognition

The first question ultimately addresses the pedagogical approach that the instructor will adhere to. The SM was chosen for the present study because Socrates is often credited as being the pioneer who systematically employed, and consequently facilitated critical thinking and metacognition (Morrell, 2004; Tanner, 2012). In addition, I followed existing recommendations advising for the use of 'Socratean' and constructivist techniques within entrepreneurial classrooms (Carrier, 2007; Neck et al., 2018). The findings highlighted some specific mechanisms of the SM which teachers can utilize when attempting to develop student metacognition.

When having the goal of increasing student metacognition, teachers should attempt to raise the students' level of interest not only towards the content itself,

but also towards their own ideas that are relevant to the contents and their learning process. Consequently, it is more probable that students will engage their metacognition during the learning process if they consider that very process to be interesting to them. Raising interest may not be an easy task as students have different predispositions towards learning, however metacognition is not content-specific, thus it could be argued that content-specific interest differs from interest towards one's own ideas, with the latter being more susceptible to alterations by the facilitator. Another important aspect relates to the safety and freedom with regards to expressing and discussing ideas during the classes, while there also must be enough time allocated to that, because how could we claim that we encourage critical thinking within our classrooms, if the time allocated to students for openly discussing their ideas is limited to a minimum? In this intervention, students took great pleasure in being able to speak up their mind and share openly their ideas, and by doing so they were bringing into their learning process their own unique knowledge and experiences, which are vital for metacognition. In addition, they were equally satisfied in hearing the ideas of their peers, which altogether contributes to the students' appreciation of sharing and exchanging knowledge and experiences with one-another, as that allows to develop original ideas via reflecting on them, as well as learn something new from the peers, altogether leading to a wider pool of knowledge that is being discussed which provides more 'food for thought' to the learner. The fear of speaking up also must be taken into consideration, so the role of the facilitator becomes very important with regards to instilling safety into the classroom.

The mechanisms highlighted in this study naturally do not cover all possible ways in which the SM contributes to the development of metacognition. There is a need for more research on the applicability of the SM within EE, or other constructivist and inquiry-based pedagogies, with the purpose of sharing best practices and generating somewhat of a portfolio (by Neck et al., 2011) that educators could then use within their classrooms and further develop such ideas. On the other hand, dialogue-based education may pose some challenges with regards to the number of students present in the classrooms. It is hard to imagine that such a method will work the same with a class of 15 and 50 students. Nonetheless, it would be interesting from a research point of view to test this assumption. The research question could consider whether an increasing number of students within a classroom diminishes the quality of dialogue-based education, and whether than differently affects changes in metacognition. In addition, it would be useful to compare whether different pedagogical approaches have different effects on student metacognition. As expressed earlier, one of the limitations of the present study is the absence of a control group where the instructional method would differ from the SM. This could have been for example a traditional lecturing approach, where all content is delivered via instruction and little time is granted for discussions and independent thinking during the classes. By doing so, it would be possible to establish whether constructivist approaches deem

more effective for facilitating metacognition against its counterparts (behaviorism and cognitivism). At a propositional level, I expect behaviorism to yield worse results than constructivism, whereas cognitivism might do better than behaviorism but worse than constructivism. Partially my arguments for that have been expressed earlier in this thesis (see 2.6), and so it would be interesting to put those assumptions into test. Finally, regardless of the chosen method, it would be useful to have detailed descriptions of said practices to be able to implement them elsewhere. Simply claiming that course 'X' or 'Y' led to 'Z' outcomes without describing what was done will not contribute much to the development of better pedagogies for our students, while at the same time it becomes hard for pedagogues to understand the causes behind the reported changes in metacognition.

6.2.2 Applying Metacognition

Although metacognition can be employed at any point by an individual, it is better understood within the context of working on a task. Through assigning tasks to the students, they can put metacognition into practice and clearly see how it works and what benefits it brings. Especially in the field of EE, it is common to assign such tasks that require the creation of an innovative idea (Neck et al., 2011; Neck et al., 2018). The same was done in the case of this study, where students were asked to come up with an entrepreneurial idea of their own in a limited amount of time. As explained earlier, the time constrictions of the course limited the number of tasks that were given down to one. However, assuming that there are no serious time restrictions, pedagogues can plan the assignment of several tasks, preferably with the aim of addressing each dimension of metacognition separately, before assigning the task that would require the application of all dimensions. The very items that form the dimension within instruments (whether it is the MAC or other) can be used as a guide when creating the tasks. When building the task, pedagogues can consider questions that come with it, with said questions appealing to the items of the chosen instrument. The students can be gradually guided dimension-by-dimension to mastering the metacognitive cycle, and then the final task may be representative of the whole set of dimensions.

Furthermore, when assigning tasks to students, it would be useful to ask them to reflect on them so that they can clearly understand how they have landed on their end-result. More specifically, they can focus on how they planned for the task, how they monitored the way they have chosen to deal with it, and finally consider the outcome against the original plan. This is in line with experiential learning which has been highlighted as an important contributor to entrepreneurial ventures (Mason et al., 2013). Therefore, as much as it is important to assign tasks so that students can learn through experiences, that learning becomes stronger when they are reflecting on it. This was evident also in the learning diaries of the students, where they have reflected on their final task which enabled them to extract takeaways for future purposes. It is also important to keep in mind the

entrepreneurial nature of the tasks that will be assigned. That is, the tasks must be of entrepreneurial character, so that students can also 'feel' like entrepreneurs when working on a task. Assuming that the students will manage to succeed in completing the tasks via employing their metacognition, I would propose that this will also contribute to their self-efficacy with regards to considering entrepreneurship as a potential career option, which is what EE is striving at, yet so far has not delivered what was expected.

6.2.3 Metacognition – To Measure or to Assess?

In this thesis, I have raised several times the question with regards to measuring and assessing metacognition. When attempting to do either of those, we should ask ourselves what each method (i.e. quantitative or qualitative) tells us. For example, there are several instruments claiming that they measure metacognition (e.g. Haynie et al., 2009; Ling et al., 2015; García et al., 2014) but it seems that the results they yield are not consistent, and contradictions have been found among them, mainly in the way the items of the instrument load on different dimensions of metacognition. All authors from the aforementioned studies recognize in their papers the need for further development, and probably with more research being conducted on the topic, it should be expected that more reliable and consistent instruments that can be generalized will appear, however, we should ask ourselves whether an instrument is suitable for studying metacognition? Standardized assessment methods may not be in fact suitable for the task, because they are simply testing a pre-existing set of knowledge, while at the same time they limit the higher-order thinking of our students (Stanger-Hall, 2011), with metacognition being a higher-order cognitive skill. Instruments tend to generalize findings for statistical analysis; however, metacognition concerns the learning strategies of an individual that are based on knowledge and experiences that are unique to each learner. In addition, the demand effect will probably have some impact on the results of the instruments, especially when using a pre/post approach. If we want to understand the thinking process of our students, wouldn't it be more reasonable to have insight into that thinking process in a qualitative form, rather than a number? I understand that instruments allow for generalization and comparison, but I doubt that they can explore the nature of metacognition as good as qualitative means. I am not advocating for not measuring quantitively metacognition, but rather underlining the insufficiency of the method with regards to understanding metacognition. In general, the measurement of metacognition is an ongoing debate (Akturk et al., 2011; Ozturk, 2018), however we should keep in mind the very definition of metacognition is, when attempting to either measure it or assess it.

As for the learning diaries used in this study, they had several purposes. First, utilizing them within the context of EE is beneficial in the sense that it allows students to think thoroughly about their ideas and then express them in their

diaries, and by doing so, they are able to re-evaluate them and gain deeper insights (Heinonen & Poikkijoki, 2006). Second, their qualitative nature is preferred when assessing metacognition (Tobias et al., 2002). Although my focus was more on the mechanisms through which the SM facilitates metacognition, arguably an extract from the learning diary can tell us more about a student's metacognition than a number on a statement. On the other hand, there also questions surrounding the assessment of metacognition from a qualitative point of view. For example, when analyzing qualitative material of any form, we should consider what makes an extract to be considered metacognitive? I would propose that such classification can be based on Bloom's Taxonomy. More specifically, if we detect analysis and evaluation of one's learning process within our data, then we could consider it as being metacognitive. In other words, that would mean that we look for qualitative data which informs us that the students go beyond the application of content-specific knowledge when giving their answers (see 2.2.2).

Ideally, we should be interested in reading whether the students have justified 'why' and 'how' they have been learning, which would also indicate that they have thoroughly reflected on the process. This in turn should act as a rather clear signal of employing metacognition to the assessor, even if the students themselves are not fully aware of it (Schunk, 2012, p. 289). Indeed, learning diaries proved insightful for this study and I took great pleasure in reading them, as they had the power to inform me about what students were thinking about their learning. For example, some students mentioned that they had opened something entirely new for themselves with regards to how they are learning, which according to their words boosted their confidence and self-efficacy with regards of being capable in becoming an entrepreneur. That is, without doubt, a learning outcome we should be seeking in EE.

I believe that it would be fruitful to observe metacognition in a real-time setting. That is, as we assign tasks to our students, we could either ask them to record them via audio/video, or teachers can do so by themselves. This may pose some challenges in terms of the required time as well as student comfort in being recorded, however the insights it will generate will probably outweigh them. Having done that, the students could reflect on how they dealt with the task, and then the instructor can weigh in his/her assessment. Metacognition is not something that has an end-result, but rather represents the continuous development of one's learning. In turn, the more students systematically reflect on it with the help of the instructors, the higher their learning potential becomes – and this should be in the interest of any pedagogue, if not a prime concern.

References

Acar, O. A., & Tuncdogan, A. (2019). Using the Inquiry-Based Learning Approach to Enhance Student Innovativeness: A Conceptual Model. *Teaching in Higher Education: Critical Perspectives, 24*(7), 895-909. https://doi.org/10.1080/13562517.2018.1516636

Akturk, A. O., & Sahin, I. (2011). Literature Review on Metacognition and its Measurement. *Procedia – Social and Behavioral Sciences, 15*, 3731-3736. https://doi.org/10.1016/j.sbspro.2011.04.364

Alvarez, S. A., & Barney, J.B. (2007). Discovery and Creation: alternative theories of entrepreneurial action. *Strategic Entrepreneurship Journal, 1*(1-2), 11-26. https://doi.org/10.1002/sej.4

Alvarez, S. A., Barney, J.B., & Young, S.L. (2010). Debates in Entrepreneurship: Opportunity Formation and Implications for the Field of Entrepreneurship. In Acs, Z., & Audretsch, D. (Eds.), *Handbook of Entrepreneurship Research. International Handbook Series on Entrepreneurship, vol. 5* (pp. 23-45). New York City, New York, USA: Springer.

Anderson, L. W., Kratwohl, D. R., Airasian, P. W., Cruikshank, K. A., Mayer, R. E., Pintrich, P. R., Raths, J., & Wittrock, M. C. (2001). *A Taxonomy for Learning, Teaching, and Assessing. A Revision of Bloom's Taxonomy of Educational Objectives*. New York City, New York, USA: Longman, Inc.

Armbruster, B. B. (1989). Metacognition in Creativity. In J.A. Glover, R.R. Ronning, & C.R. Reynolds (Eds.), *Handbook of Creativity* (pp. 177-182). Boston, Massachusetts, USA: Springer.

Arthur, W.B. (1994). Inductive Reasoning and Bounded Rationality. *The American Economic Review, 84*(2), 406-411. Retrieved from https://www.jstor.org/stable/2117868

Audretsch, D.B. (2009). The entrepreneurial society. *The Journal of Technology Transfer, 34*(3), 245-254. https://doi.org/10.1007/s10961-008-9101-3

Audretsch, D.B. (2012). Entrepreneurship research. *Management Decision, 50*(5), 755-764. https://doi.org/10.1108/00251741211227384

Bae, T.J., Qian, S., Miao, C., & Fiet, J.O. (2014). The Relationship between Entrepreneurship Education and Entrepreneurial Intentions: A Meta-Analytic Review. *Entrepreneurship Theory and Practice, 38*(2), 217-254. https://doi.org/10.1111/etap.12095

Baker, L., & Brown, A.L. (1984). Metacognitive skills and reading. In P.D. Pearson (Eds.), *Handbook of reading research* (pp. 353-394). New York City, New York, USA: Longman.

Baker, L., Cerro, L. C. (2000). 3. Assessing Metacognition in Children and Adults. In G. Schraw & J. C. Impara (Eds.), *Issues in the Measurement of Metacognition* (pp. 99-145). Lincoln, Nebraska, USA: Buros Institute of Mental Measurements.

Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*(9), 1175-1184. http://dx.doi.org/10.1037/0003-066X.44.9.1175

Bandura, A. (1991). Social cognitive theory of self-regulation. *Organizational Behavior and Human Decision Processes, 50*(2), 248-287. https://doi.org/10.1016/0749-5978(91)90022-L

Bandura, A. (2001). Social Cognitive Theory: An Agentic Perspective. *Annual Review of Psychology, 52*, 1-26. https://doi.org/10.1146/annurev.psych.52.1.1

Bandura, A., & Walters, R.H. (1963). *Social Learning and Personality Development*. New York City, New York, USA: Holt, Rinehart & Winston.

Barbosa, S.D., Gerhardt, M.W., & Kickul, J.R. (2007). The Role of Cognitive Style and Risk Preference on Entrepreneurial Self-Efficacy and Entrepreneurial Intentions. *Journal of Leadership and Organizational Studies, 13*(4), 86-104. https://doi.org/10.1177/10717919070130041001

Baricaua, G. S. (2015). Collaborative professional learning through lesson study: Identifying the challenges of inquiry-based teaching. *Issues in Educational Research, 25*(2), 118-134. Retrieved from https://search.informit.com.au/documentSummary;dn=376688277371502;res=IELAPA

Baron, A. (2008). The Role of Affect in the Entrepreneurial Process. *Academy of Management Review, 33*(2), 328-340. DOI: 10.2307/20159400

Baron, R.A. (2014). Thinking about cognition and its central role in entrepreneurship: confessions of a 'reformed' behaviorist. In J.R. Mitchell, R.K. Mitchell, & B. Randolph-Seng (Eds.), *Handbook of Entrepreneurial Cognition* (pp. 61-85). Cheltenham, England, UK: Edward Elgar Publishing.

Baron, R.A., Franklin, R.J., & Hmieleski, K.M. (2016). Why Entrepreneurs Often Experience Low, Not High, Levels of Stress: The Join Effects of Selection and Psychological Capital. *Entrepreneurship Theory and Practice, 42*(3), 742-768. https://doi.org/10.1177/0149206313495411

Baron, R.A., Mueller, B.A., & Wolfe, M.T. (2016). Self-efficacy and entrepreneurs' adoption of unattainable goals: The restraining effects of self-control. *Journal of Business Venturing, 31*(1), 55-71. https://doi.org/10.1016/j.jbusvent.2015.08.002

Bartimote-Aufflick, K., Bridgeman, A., Walker, R., Sharma, M., & Smith, L. (2016). The study, evaluation, and improvement of university student self-efficacy. *Studies in Higher Education, 41*(11), 1918-1942. https://doi.org/10.1080/03075079.2014.999319

Béchard, J., & Grégoire, D. (2005). Entrepreneurship Education Research Revisited: The Case of Higher Education. *Academy of Management Learning & Education, 4*(1), 22-43. Retrieved from https://www.jstor.org/stable/40214261

Blume, B.D., & Covin, J.G. (2011). Attributions to intuition in the venture founding process: Do entrepreneurs actually use intuition or just say they do? *Journal of Business Venturing, 26*(1), 137-151. https://doi.org/10.1016/j.jbusvent.2009.04.002

Bowles, D. (2007). Wrongfully Accused: The Political Motivations behind Socrates' Execution. Retrieved from https://www.mcgill.ca/classics/files/classics/2006-7-03.pdf

Brainerd, C. (1978). The stage question in cognitive-developmental theory. *The Behavioral and Brain Sciences, 1*(2), 173-213. https://doi.org/10.1017/S0140525X00073842

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology, 3*(2), 77-101. DOI: 10.1191/1478088706qp063oa

Bredo, E. (1997). The social construction of learning. In G. Phye (Eds.), *Handbook of academic learning: The construction of knowledge* (pp. 3-45). New York City, New York, USA: Academic Press.

Brickhouse, T.C., & Smith, N.D. (2009). Socratic Teaching and Socratic Method. In H. Siegel, *The Oxford Handbook of Philosophy of Education* (pp. 177-194). Oxford, England, UK: Oxford University Press.

Brooks, J. G., & Brooks, M. G. (1999). *In search of understanding: The case for constructivist classrooms*. Alexandria, Virginia, USA: Association for Supervision and Curriculum Development.

Brown, J.S., Collins, A., & Duguid, P. (1989). Situated Cognition and the Culture of Learning. *Educational Researcher, 18*(1), 32-42. https://doi.org/10.3102/0013189X018001032

Bruner, J. S. (1961). The act of discovery. *Harvard Educational Review, 31*, 21-32.

Bryant, P.T. (2006). Improving entrepreneurial education through self-regulatory skills, presented at National Collegiate Inventors and Innovators Alliance Meeting, 2006. Portland, Oregon, USA: NCIIA.

Bryman, A. & Bell, E. (2003). *Business research methods*. Oxford, England, UK: Oxford University Press.

Busenitz, L., & Lau, C.-M. (1996). A Cross-Cultural Cognitive Model of New Venture Creation. *Entrepreneurship Theory and Practice, 20*(4), 25-40. https://doi.org/10.1177/104225879602000403

Busenitz, L.W., West, G.P., Shepherd, D., Nelson, T., Chandler, G.N., & Zacharakis, A. (2003). Entrepreneurship Research in Emergence: Past Trends and Future Directions. *Journal of Management, 29*(3), 285-308. https://doi.org/10.1016/S0149-2063_03_00013-8

Calderhead, J. (1989). Reflective teaching and teacher education. *Teaching and Teacher Education, 5*(1), 43-51. https://doi.org/10.1016/0742-051X(89)90018-8

Campbell, K. (2011). Caring and daring entrepreneurship research. *Entrepreneurship & Regional Development: An International Journal, 23*(1-2), 37-47. DOI: 10.1080/08985626.2011.540407

Cardon, M., Wincent, J., Singh, J., & Drnovsek, M. (2009). THE NATURE AND EXPERIENCE OF ENTREPRENEURIAL PASSION. *Academy of Management Review, 34*(3), 511-532. https://doi.org/10.5465/amr.2009.40633190

Carrey, T.A., & Mullan, R.J. (2004). What is Socratic questioning? *Psychotherapy: Theory, Research, Practice, Training, 41*(3), 217-226. http://dx.doi.org/10.1037/0033-3204.41.3.217

Carrier, C. (2007). Strategies for teaching entrepreneurship: what else beyond lectures, case studies, and business plans? In A. Fayolle (Eds.), *Handbook of Research in Entrepreneurship Education, Volume 1* (pp. 143-159). Cheltenham, England, UK: Edward Elgar Publishing.

Chaiklin, S. (2003). The zone of proximal development in Vygotsky's analysis of learning and instruction. In A. Kozulin, B. Gindis, V. S. Ageyev, & S. M. Miller (Eds.), *Learning in doing. Vygotsky's educational theory in cultural context* (p. 39–64). Cambridge, England, UK: Cambridge University Press.

Chen, C.C., Greene, P.G., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing, 13*(4), 295-316. https://doi.org/10.1016/S0883-9026(97)00029-3

Cho, Y.S., & Jung, J.Y. (2014). The Relationship Between Metacognition, Entrepreneurial Orientation, and Firm Performance: An Empirical Investigation. *Academy of Entrepreneurship Journal, 20*(2), 71-86.

Cohen, J.W. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, New Jersey, USA: Lawrence Erlbaum Associates.

Colbourne, L., & Sque, M. (2005). The culture of cancer and the therapeutic impact of qualitative research interviews. *Journal of Research in Nursing, 10*(5), 551-567. DOI: 10.1177/136140960501000501

Collins, A. (1977). Processes in acquiring knowledge. In R. C. Anderson, R. J. Spiro, & W. E. Montague (Eds.), *Schooling and the acquisition of knowledge* (pp. 339-363). Hillsdale, New Jersey, USA: Erlbaum.

Cope, J. (2005). Toward a Dynamic Learning Perspective of Entrepreneurship. *Entrepreneurship Theory & Practice, 29*(4), 373-397. https://doi.org/10.1111/j.1540-6520.2005.00090.x

David, P.A., & Foray, D. (2002). An introduction to the economy of the knowledge society. *International Social Science Journal, 54*(171), 9-23. https://doi.org/10.1111/1468-2451.00355

Davidsson, P. (2009). *The Entrepreneurship Research Challenge*. Cheltenham, England, UK: Edward Elgar Publishing.

Davidsson, P. (2017). Entrepreneurial opportunities as prospensities: Do Ramoglou & Tsang move the field forward? *Journal of Business Venturing Insights, 7*, 82-85. https://doi.org/10.1016/j.jbvi.2016.02.002

de Acedo Lizarraga, M. L. S., & de Acedo Baquedano, M. T. S. (2013). How creative potential is related to metacognition. *European Journal of Education and Psychology, 6*(2), 69–81. DOI: 10.1989/ejep.v6i2.104

Denzin, N. K. (2012). Triangulation 2.0. *Journal of Mixed Methods Research, 6*(2), 80-88. https://doi.org/10.1177/1558689812437186

DeVellis, R. F. (2012). *Scale Development: Theory and Applications*. Thousand Oaks, California, USA: SAGE.

Dimitratos, P., Buck, T., Fletcher, M., & Li, N. (2016). The motivation of international entrepreneurship: The case of Chinese transnational entrepreneurs. *International Business Review, 25*(5), 1103-1113. https://doi.org/10.1016/j.ibusrev.2016.01.012

Duckworth, E. (1964). Piaget rediscovered. *Journal of Research in Science and Teaching, 2*(3), 172-175. https://doi.org/10.1002/tea.3660020305

Duell, O.K. (1986). Metacognitive skills. In G.D. Phye & T. Andre (Eds.), *Understanding, thinking, and problem solving* (pp. 205-242). Orlando, Florida, USA: Academic Press.

Duncan, R.M. (1995). Piaget and Vygotsky revisited: Dialogue or Assimilation? *Developmental Review, 15*(4), 458-742. https://doi.org/10.1006/drev.1995.1019

Easterling, P.E. (1997). *The Cambridge Companion to Greek Tragedy* (Eds.). Cambridge, England, UK: Cambridge University Press.

Edelman, L., Manolova, T., Brush, C. (2008). Entrepreneurship Education: Correspondence Between Practices of Nascent Entrepreneurs and Textbook Prescriptions for Success. *Academy of Management Learning & Education, 7*(1), 56-70. https://doi.org/10.5465/amle.2008.31413862

Edelson, D. C., Gording, D. N., & Pea, R. D. (1999). Addressing the Challenges of Inquiry-Based Learning Through Technology and Curriculum Design. *Journal of the Learning Sciences, 8*(3-4), 391-450. https://doi.org/10.1080/10508406.1999.9672075

Ehiobuche, C., Tu, H-W., & Justus, B. (2012). Dialogue as a Tool for Teaching and Learning of Entrepreneurship. *Proceedings of ASBBS, 19*(1), 300-309. Retrieved from http://asbbs.org/files/ASBBS2012V1/PDF/E/EhiobucheC.pdf

Eisenhardt, K. M. (1989). Building Theories from Case Study Research. *The Academy of Management Review, 14*(4), 532-550. Retrieved from https://www.jstor.org/stable/258557

Elert, N., Andersson, F. W., & Wennberg, K. (2015). The impact of entrepreneurship education in high school on long-term entrepreneurial performance. *Journal of Economic Behavior & Organization, 111*, 209-223. https://doi.org/10.1016/j.jebo.2014.12.020

Ertmer, P.A., & Newby, T.J. (2013). Behaviorism, Cognitivism, Constructivism: Comparing Critical Features From an Instructional Design Perspective. *Performance Improvement Quarterly, 26*(2), 43-71. https://doi.org/10.1002/piq.21143

Fayolle, A. (2013). Personal views on the future of entrepreneurship education. *Entrepreneurship & Regional Development, 25*(7-8), 692-701. https://doi.org/10.1080/08985626.2013.821318

Flavell, J.H. (1979). Metacognition and cognitive monitoring: A new area of cognitive-developmental inquiry. *American Psychologist, 34*(10), 906-911. http://dx.doi.org/10.1037/0003-066X.34.10.906

Flavell, J.H., & Wellman, H.M. (1977). Metamemory. In R.B. Kail, Jr., & J.W. Hagen (Eds.), *Perspectives on the development of memory and cognition* (pp. 3-33). Hillsdale, New Jersey, USA: Erlbaum.

Ford, J.K. (2006). Learning with a learner control training environment: The interactive effects on goal orientation and metacognitive instruction on learning outcomes. *Personnel Psychology, 56*(2), 405-429. DOI: 10.1111/j.1744-6570.2003.tb00156.x

Ford, J.K. (2006). Learning with a learner control training environment: The interactive effects on goal orientation and metacognitive instruction on learning outcomes. *Personnel Psychology, 56*(2), 405-429. DOI: 10.1111/j.1744-6570.2003.tb00156.x

Fox, R. (2001). Constructivism Examined. *Oxford Review of Education, 27*(1), 23-35. https://doi.org/10.1080/03054980125310

García, S. J. S., Boada-Grau, J., Prizmic-Kuzmica, A. J., & Hernández-Sánchez, B. (2014). Psychometric Properties and the Factor Structure of the Spanish Version of the Cognitive Adaptability Scale (MAC)*. *Universitas Psychologica, 13*(1), 311-320. doi:10.11144/ Javeriana.UPSY13-1.ppfs

Genson, G. L. (1992). Teaching Entrepreneurship Through The Classics. *Journal of Applied Business Research, 8*(4), 135-140. https://doi.org/10.19030/jabr.v8i4.6135

Gerring, J. (2004). What is a Case Study and What Is It Good for? *The American Political Sciences Review, 98*(2), 341-354. Retrieved from https://www.jstor.org/stable/4145316

Golafshani, N. (2003). Understanding Reliability and Validity in Qualitative Research. *The Qualitative Report, 8*(4), 597-606. Retrieved from https://nsuworks.nova.edu/tqr/vol8/iss4/6

Gose, M. (2009). When Socratic Dialogue is Flagging: Questions and Strategies for Engaging Students. *College Teaching, 57*(1), 45-50. https://doi.org/10.3200/CTCH.57.1.45-50

Greenbank, P. (2003). The role of values in educational research: the case for reflexivity. *British Educational Research Journal, 29*(6), 791-801. https://doi.org/10.1080/0141192032000137303

Greeno, J. G. (1989). A perspective on thinking. *American Psychologist, 44*(2), 134–141. https://doi.org/10.1037/0003-066X.44.2.134

Gunstone, R.F. (1998). Constructivism and metacognition: Theoretical issues and classroom studies. In R. Duit, F. Goldberg, & H. Niedderer (Eds.), *Research in Physics Learning: Theoretical Issues and Empirical Studies* (pp. 129-140). Kiel, Germany: IPN.

Guthrie, E.R. (1952). The psychology of learning. New York City, New York, USA: Harper.

Hashi, I., & Krasniqi, B. A. (2008). Entrepreneurship and SME Growth: Evidence from Advanced and Laggard Transition Economies. *International Journal of Entrepreneurial Behaviour & Research, 17*(5), 456-487. DOI: 10.1108/13552551111158817

Hayek, F.A. (1945). The Use of Knowledge in Society. *The American Economic Review, 35*(4), 519-530. Retrieved from https://www.jstor.org/stable/1809376

Haynie, J.M., Shepherd, D., Mosakowski, E., & Earley, P.C. (2010). A situated metacognitive model of the entrepreneurial mindset. *Journal of Business Venturing, 25*(2), 217-229. https://doi.org/10.1016/j.jbusvent.2008.10.001

Haynie, J.M., Shepherd, D.A., & Patzelt, H. (2012). Cognitive Adaptability and an Entrepreneurial Task: The Role of Metacognitive Ability and Feedback. *Entrepreneurship Theory and Practice, 36*(2), 237-265. https://doi.org/10.1111/j.1540-6520.2010.00410.x

Haynie, M., & Shepherd, D.A. (2007). Exploring the Entrepreneurial Mindset: Feedback and Adaptive Decision-Making, presented at the Babson College Entrepreneurship Research Conference (BCERC), 2007. Wellesley, Massachusetts, USA: Babson College.

Haynie, M., & Shepherd, D.A. (2009). A Measure of Adaptive Cognition for Entrepreneurship Research. *Entrepreneurship Theory and Practice, 33*(3), 695-714. https://doi.org/10.1111/j.1540-6520.2009.00322.x

Healey, M. (2005). Linking research and teaching: exploring disciplinary spaces and the role of inquiry-based learning. In R. Barnett (Eds.), *Reshaping the University: New Relationships between Research, Scholarship and Teaching* (pp. 67-78). New York City, New York, USA: McGraw Hill/Open University Press.

Heinonen, J. and Poikkijoki, S.-A. (2006), "An entrepreneurial-directed approach to entrepreneurship education: mission impossible?", *Journal of Management Development*, 25(1), 80-94.

Heise, D.R. (1965). Semantic differential profiles for 1,000 most frequent English words. *Psychological Monographs: General and Applied, 79*(8), 1–31. https://doi.org/10.1037/h0093884

Hilgard, E. R., & Bower, G. H. (1966). Theories of learning (3rd ed.). New York City, New York, USA: Appleton-Century-Crofts.

Hilgard, E.R. (1948). *Theories of Learning*. New York City, New York, USA: Appleton-Century-Crofts.

Hindle, K. (2007). Teaching entrepreneurship at university: from the wrong building to the right philosophy. In A. Fayolle (Eds.), *Handbook of Research in Entrepreneurship Education, Volume 1* (pp. 104-126). Cheltenham, England, UK: Edward Elgar Publishing.

Hoaglund, J. (1993). Critical thinking: A Socratic model. *Argumentation, 7*(3), 291-311. https://doi.org/10.1007/BF00710814

Huq, A., & Gilbert, D. (2017). All the world's stage: transforming entrepreneurship education through design thinking. *Education + Training, 59*(2), 155-170. https://doi.org/10.1108/ET-12-2015-0111

Jick, T. D. (1979). Mixing Qualitative and Quantitative Methods: Triangulation in Action. *Administrative Science Quarterly, 24*(4), 602-611. DOI: 10.2307/2392366

Jonassen, D. H. (1991). Objectivism vs constructivism. Do we need a new philosophical paradigm? *Educational Technology Research and Development, 39*(3), 5-14. https://doi.org/10.1007/BF02296434

Kakouris, A. (2015). Entrepreneurship pedagogies in lifelong learning: Emergence of criticality. *Learning, Culture and Social Interaction, 6*, 87-97. https://doi.org/10.1016/j.lcsi.2015.04.004

Karnes, F.A., & Nugent, S.A. (2004). *Profiles of Influence in Gifted Education: Historical Perspectives and Future Directions*. Waco, Texas, USA: Prufrock Press Inc.

Katz, J. (2008). Fully Mature but not Fully Legitimate: A Different Perspective on the State of Entrepreneurship Education. *Journal of Small Business Management, 46*(4), 550-566. https://doi.org/10.1111/j.1540-627X.2008.00256.x

Kayne, J.A., & Altman, J.W. (2005). Creating Entrepreneurial Societies: The Role and Challenge for Entrepreneurship Education. *Journal of Asia Entrepreneurship and Sustainability, 1*(1), 1-12. Retrieved from http://www.asiaentrepreneurshipjournal.com/AJESI1Kayne.pdf

Kent, C. (1990). *Entrepreneurship Education: Current Developments, Future Directions*. Westport, Connecticut, USA: Greenwood Publishing Group.

Keynes, J.M. (1930). Economic Possibilities for our Grandchildren. In Keynes, J.M., *Essays in Persuasion* (pp. 358-373). New York City, New York, USA: W.W. Norton & Co.

Kim, B. (2001). Social constructivism. In M. Orey (Eds.), *Emerging Perspectives on Learning, Teaching, and Technology* (pp. 55-61). Scotts Valley, California, USA: CreateSpace Independent Publishing.

Knezic, D., Wubbels, T., Elbers, E., & Hajer, M. (2010). *Teaching and Teacher Education, 26*(4), 1104-1111. https://doi.org/10.1016/j.tate.2009.11.006

Kratwohl, D.R. (2002). A Revision of Bloom's Taxonomy: An Overview. *Theory into Practice, 41*(4), 212-218. Retrieved from https://www.depauw.edu/files/resources/krathwohl.pdf.

Krueger, N.F. (2003). The Cognitive Psychology of Entrepreneurship. In Z.J. Acs, & D.B. Audretsch (Eds.), *Handbook of Entrepreneurship Research* (pp. 105-140). Boston, Massachusetts, USA: Springer.

Kuhn, D. (1999). A Developmental Model of Critical Thinking. *Educational Researcher, 28*(2), 16-46. https://doi.org/10.3102/0013189X028002016

Kuratko, D. (2005). The Emergence of Entrepreneurship Education: Development, Trends, and Challenges. *Entrepreneurship Theory and Practice, 29*(5), 577-597. https://doi.org/10.1111/j.1540-6520.2005.00099.x

Lam, F. (2011). The Socratic method as an approach to learning and its benefits. Dietrich College Honors Thesis. Paper 134. Retrieved from Http://repository.cmu.edu/hsshonors/134

Lehner, O.M., & Kansikas, J. (2012). Opportunity Recognition in Social Entrepreneurship: A Thematic Meta Analysis. *The Journal of Entrepreneurship, 21*(1), 25-58. https://doi.org/10.1177/097135571102100102

Ling, H., & Venesaar, U. (2015). Enhancing Entrepreneurship Education in Engineering Students to Increase Their Metacognitive Abilities: Analysis of

Student Self-Assessment. *Engineering Economics, 26*(3), 333-342. http://dx.doi.org/10.5755/j01.ee.26.3.5283

Ling, H., Kyrö, P., & Venesaar, U. (2013). Entrepreneurship education and metacognitive awareness: development of a tool to measure metacognitive awareness. In A. Fayolle, P. Kyrö, T. Mets, & U. Venesaar (Eds.), *Conceptual Richness and Methodological Diversity in Entrepreneurship Research* (pp. 95-111). Cheltenham, England, UK: Edward Elgar Publishing.

Liu, C. H. (2005). Vygotsky's philosophy: Constructivism and its criticisms explained. *International Education Journal, 6*(3), 386-399.

Lourenco, O., & Machado, A. (1996). In Defense of Piaget's Theory: A Reply to 10 Common Criticisms. *Psychological Review, 103*(1), 143-164. DOI: 10.1037/0033-295X.103.1.143

Low, M.B., & MacMillan, I.C. (1988). Entrepreneurship: Past Research and Future Challenges. *Journal of Management, 14*(2), 139-161. Retrieved from https://www.researchgate.net/profile/Ian_Macmillan5/publication/246075266_Entrepreneurship_Past_Research_and_Future_Challenges/links/563fce4608aec6f17ddb8392/Entrepreneurship-Past-Research-and-Future-Challenges.pdf

Maritz, A. (2017). Illuminating the black box of entrepreneurship education programmes: Part 2. *Education + Training, 59*(5), 471-482. https://doi.org/10.1108/ET-02-2017-0018

Mason, C., & Arshed, N. (2013). Teaching Entrepreneurship to University Students through Experiential Learning: A Case Study. *Industry and Higher Education, 27*(6), 449-463. https://doi.org/10.5367/ihe.2013.0180

McDowell, J. (1979). Virtue and Reason. *The Monist, 62*(3), 331-350. Retrieved from https://www.jstor.org/stable/27902600

Meyer, G. (2011). The Reinvention of Academic Entrepreneurship. *Journal of Small Business Management, 49*(1), 1-8. DOI: 10.1111/j.1540-627X.2010.00311.x

Mitchell, J.R., Smith, J.B., Gustafsson, V., Davidsson, P., & Mitchell, R.K. (2005). Thinking About Thinking About Thinking: Exploring How Entrepreneurial Metacognition Affects Entrepreneurial Expertise, presented at The Babson Research Conference, 2005. Wellesley, Massachusetts, USA: Babson College.

Mitchell, R.K. (2011). Increasing Returns and the Domain of Entrepreneurship Research. *Entrepreneurship Theory & Practice, 35*(4), 615-629. https://doi.org/10.1111/j.1540-6520.2011.00473.x

Mitchell, R.K., Bailey, A.D., & Mitchell, J.R. (2008). Entrepreneurship, Thinking, and Economic Self-Reliance. *Journal of Microfinance/ESR Review, 10*(1), 8-13. Retrieved from https://scholarsarchive.byu.edu/cgi/viewcontent.cgi?article=1161&context=esr

Mitchell, R.K., Busenitz, L., Lant, T., McDougall, P.P., Morse, E.A., & Smith, J.B. (2002). Toward a Theory of Entrepreneurial Cognition: Rethinking the

People Side of Entrepreneurship Research. *Entrepreneurship Theory and Practice, 27*(2), 93-104. https://doi.org/10.1111/1540-8520.00001

Mitchell, R.K., Busenitz, L.W., Bird, B., Caglio, C.M., McMullen, J.S., Morse, E.A., & Smith, B. (2007). The Central Question in Entrepreneurial Cognition Research 2007. *Entrepreneurship Theory and Practice, 31*(1), 1-27. https://doi.org/10.1111/j.1540-6520.2007.00161.x

Moessinger, P. (1978). Piaget on Equilibration. *Human Development, 21*(4), 255-267. https://doi.org/10.1159/000271589

Moore, J. (2011). Behaviorism. *The Psychological Record, 61*, 449-463. https://doi.org/10.1007/BF03395771

Morrell, K. (2004). Socratic Dialogues as a Tool for Teaching Business Ethics. *Journal of Business Ethics, 53*(4), 383-392. https://doi.org/10.1023/B:BUSI.0000043500.63029.40

Morris, M. H., Webb, J. W., & Singhal, S. (2013). A Competency-Based Perspective on Entrepreneurship Education: Conceptual and Empirical Insights. *Journal of Small Business Management, 51*(3), 352-369. DOI: 10.1111/jsbm.12023

Morse W.H, & Kelleher R.T. (1977). Determinants of reinforcement and punishment. In W.K. Honig & J.E.R. Staddon (Eds.), *Handbook of operant behavior* (174-200). Englewood Cliffs, New Jersey, USA: Prentice-Hall.

Mukherji, A., Mukherji, J., & Hurtado, P.S. (2011). DETERMIANTS OF PERFORMANCE: THE ROLES OF METACOGNITION AND ENTREPRENEURIAL ORIENTATION. *Academy of Management Proceedings, 2011*(1), 1-6. DOI: 10.5465/AMBPP.2011.65870519

Mulnix, J. W. (2012). Thinking critically about critical thinking. *Educational Philosophy and Theory, 44*(5), 464-479. https://doi.org/10.1111/j.1469-5812.2010.00673.x

Mundform, D. J., Shaw, D. G., & Ke, T. L. (2005). Minimum Sample Size Recommendations for Conducting Factor Analyses. *International Journal of Testing, 5*(2), 159-168. https://doi.org/10.1207/s15327574ijt0502_4

Murray, J. (2013). Likert Data: What to Use, Parametric or Non-Parametric? *International Journal of Business and Social Science, 4*(11), 258-264. Retrieved from https://ijbssnet.com/journals/Vol_4_No_11_September_2013/23.pdf

Nabi, G., Liñán, F., Fayolle, A., Krueger, N., & Walmsley, A. (2017). The Impact of Entrepreneurship Education in Higher Education: A Systematic Review and Research Agenda. *Academy of Management Learning & Education, 16*(2), 277-299. https://doi.org/10.5465/amle.2015.0026

Nambisan, S., & Baron, R.A. (2013). Entrepreneurship in Innovation Ecosystems: Entrepreneur's Self-Regulatory Processes and Their Implications for New Venture Success. *Entrepreneurship Theory and Practice, 37*(5), 1071-1097. https://doi.org/10.1111/j.1540-6520.2012.00519.x

Neck, H.M., & Corbett, A.C. (2018). The Scholarship of Teaching and Learning Entrepreneurship. *Entrepreneurship Education and Pedagogy, 1*(1), 8-41. https://doi.org/10.1177/2515127417737286

Neck, H.M., & Greene, P.G. (2011). Entrepreneurship Education: Known Worlds and New Frontiers. *Journal of Small Business Management, 49*(1), 55-70. https://doi.org/10.1111/j.1540-627X.2010.00314.x

Nelson, L. (1980). The Socratic Method. *Thinking: The Journal of Philosophy for Children, 2*(2), 34-38. DOI: 10.5840/thinking1980228

Overholser, J.C. (1993a). Elements of the Socratic Method: I. Systematic Questioning. *Psychotherapy: Theory, Research, Practice, Training, 30*(1), 67-74. http://dx.doi.org/10.1037/0033-3204.30.1.67

Overholser, J.C. (1993b). Elements of the Socratic Method: II. Inductive Reasoning. *Psychotherapy: Theory, Research, Practice, Training, 30*(1), 75-85. http://dx.doi.org/10.1037/0033-3204.30.1.75

Overholser, J.C. (1994). Elements of the Socratic Method: III. Universal definitions. *Psychotherapy: Theory, Research, Practice, Training, 31*(2), 286-293. DOI: 10.1037/h0090222

Overholser, J.C. (1995). Elements of the Socratic Method: IV. Disavowal of knowledge. *Psychotherapy: Theory, Research, Practice, Training, 32*(2), 283-292. http://dx.doi.org/10.1037/0033-3204.32.2.283

Overholser, J.C. (1996). Elements of the Socratic Method: V. Self-improvement. *Psychotherapy: Theory, Research, Practice, Training, 33*(4), 549-559. http://dx.doi.org/10.1037/0033-3204.33.4.549

Overholser, J.C. (1999). Elements of the Socratic Method: VI. Promoting virtue in everyday life. *Psychotherapy: Theory, Research, Practice, Training, 36*(2), 137-145. http://dx.doi.org/10.1037/h0087815

Oxford University Press. (2019). Elenchus, n. Retrieved from https://www.oed.com/view/Entry/60381?redirectedFrom=elenchus#eid

Ozturk, N. (2018). Assessing Metacognition: Theory and Practices. *International Journal of Assessment Tools in Education, 4*(2), 134-148. DOI: 10.21449/ijate.298299

Pallant, J. (2011). *SPSS Survival Manual: A step by step guide to data analysis using SPSS* (4th ed.). Crows Nest, Australia: Allen & Unwin.

Pandey, K. (2014). Objectivity in Social Sciences. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2399299

Paul, R. (1990). *Critical thinking*. Rohnert Park, California, USA: Center for Critical Thinking and Moral Critique, Sonoma State University.

Paul, R., & Elder, L. (2007). Critical Thinking: The Art of Socratic Questioning. *Journal of Developmental Education, 31*(1), 36-37.

Paul, R., & Elder, L. (2008). Critical Thinking: The Art of Socratic Questioning, Part III. *Journal of Developmental Education, 31*(3), 34-35.

Pavlov, I. P. (1928). *Lectures on conditioned reflexes: Twenty-five years of objective study of the higher nervous activity (behaviour) of animals* (W. H. Gantt, Trans.). New York City, New York, USA: Liverwright Publishing Corporation.

Perkins, D. (1999). The Many Faces of Constructivism. *Educational Leadership, 57*(3), 6-11.

Peterman, N.E., & Kennedy, J. (2003). Enterprise Education: Influencing Students' Perceptions of Entrepreneurship. *Entrepreneurship Theory and Practice, 28*(2), 129-144. https://doi.org/10.1046/j.1540-6520.2003.00035.x

Petrella, F., & Richez-Battesti, N. (2014). Social entrepreneur, social entrepreneurship and social enterprise: semantics and controversies. *Journal of Innovation Economics and Management, 2*(14), 143-156. https://doi.org/10.3917/jie.014.0143

Pihie, Z.A.L., Bagheri, A., & Sani, H.A. (2013). Knowledge of Cognition and Entrepreneurial Intentions: Implications for Learning Entrepreneurship in Public and Private Universities. *Procedia, Social and Behavioral Sciences, 97*, 174-181. https://doi.org/10.1016/j.sbspro.2013.10.219

Pittaway, L., & Cope, J. (2007). Entrepreneurship Education: A Systematic Review of the Evidence. *International Small Business Journal, 25*(5), 479-510. Retrieved from https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2815321

Quigley, C., Marshall, J. C., Deaton, C. C. M., Cook, M. P., & Padilla, M. (2011). Challenges to Inquiry Teaching and Suggestions for How to Meet Them. *Science Educator, 20*(1), 55-61. Retrieved from https://eric.ed.gov/?id=EJ940939

Rohrkemper, M. M. (1989). Self-regulated learning and academic achievement: A Vygotskian view. In B. J. Zimmerman & D. H. Schunk (Eds.), *Self-regulated learning and academic achievement: Theory, research, and practice* (pp. 143-167). New York City, New York, USA: Springer-Verlag.

Ross, V. (2003). The Socratic method: What it is and how to use it in the classroom. *Stanford University Newsletter on Teaching, 13*(1), 1-4.

Rowell, J.A. (1989). Piagetian Epistemology. Equilibration and the teaching of science. *Synthese, 80*, 141-162. doi:10.1007/BF00869952

Sahlberg, P. (2010). Rethinking accountability in a knowledge society. *Journal of Educational Change, 11*(1), 45-61. https://doi.org/10.1007/s10833-008-9098-2

Sahut, J.-M., & Peris-Ortiz, M. (2014). Small business, innovation and entrepreneurship. *Small Business Economics, 42*(4), 663-668.

Sarasvathy, S.D. (2001). Causation and Effectuation: Toward a Theoretical Shift from Economic Inevitability to Entrepreneurial Contingency. *Academy of Management Review, 26*(2), 243-263.

Sarasvathy, S.D., Dew, N., Velamuri, S.R., & Venkataraman, S. (2003). Three Views of Entrepreneurial Opportunity. In Acs, Z.J., & Audretsch, D.B., *Handbook of Entrepreneurship Research. International Handbook Series on Entrepreneurship, vol 1* (pp. 141-160). Boston, Massachusetts, USA: Springer.

Schindehutte, M., Morris, M., & Allen, J. (2006). Beyond Achievement: Entrepreneurship as Extreme Experience. *Small Business Economics, 27*(4-5), 349-368. https://doi.org/10.1007/s11187-005-0643-6

Schmitz, B., & Perels, F. (2011). Self-monitoring of self-regulation during math homework behavior using standardized diaries. *Metacognition and Learning, 6*, 255-273. https://doi.org/10.1007/s11409-011-9076-6

Schnaitter, R. (1999). Some Criticisms of Behaviorism. In B.A.Thyer (Eds.), *The Philosophical Legacy of Behaviorism. Studies in Cognitive Systems, vol. 22* (209-249). Dordrecht, The Netherlands: Springer.

Schraw, G. (1998). Promoting general metacognitive awareness. *Instructional Science, 26*(1-2), 113-125. https://doi.org/10.1023/A:1003044231033

Schraw, G. (2009). A conceptual analysis of five measures metacognitive monitoring. *Metacognition and Learning, 4*(1), 33-45. https://doi.org/10.1007/s11409-008-9031-3

Schraw, G., & Dennison, R.S. (1994). Assessing Metacognitive Awareness. *Contemporary Educational Psychology, 19*, 460-745.

Schumpeter, J.A. (1942). *Capitalism, Socialism and Democracy*. New York City, New York, USA: Harper & Brothers.

Schunk, D.H. (2012). *Learning Theories: An Educational Perspective* (6th ed.). Boston, Massachusetts, USA: Pearson Education Publishing, Inc.

Shane, S., & Venkataraman, S. (2000). The Promise of Entrepreneurship as a Field of Research. *The Academy of Management Review, 25*(1), 217-226. Retrieved from https://www.jstor.org/stable/259271

Shane, S., & Venkataraman, S. (2007). The Promise of Entrepreneurship as a Field of Research. In A. Cuervo, & D. Ribeiro (Eds.), *Entrepreneurship* (pp. 171-184). Berlin, Germany: Springer. https://doi.org/10.1007/978-3-540-48543-8_8

Shapero, A., & Sokol, L. (1982). The Social Dimensions of Entrepreneurship. In C. Kent, D. Sexton, & K. Vesper (Eds.), *Encyclopedia of Entrepreneurship* (pp. 72-90). Upper Saddle River, New Jersey, USA: Prentice Hall.

Shavinina, L.V. (2008). Early Signs of Entrepreneurial Giftedness. *Gifted and Talented International, 23*(1), 9-16. https://doi.org/10.1080/15332276.2008.11673508

Shepherd, D. A., & Patzelt, H. (2018). *Entrepreneurial Cognition: Exploring the Mindset of Entrepreneurs*. New York City, New York, USA: Springer.

Short, J.C., Ketchen Jr., D.J., Shook, C.L., & Ireland, R.D. (2010). The Concept of "Opportunity in Entrepreneurship Research: Pas Accomplishments and Future Challenges. *Journal of Management, 36*(1), 40-65. DOI: 10.1177/0149206309342746

Simon, H. A. (1996). *The Sciences of the Artificial* (3rd ed.). Cambridge, Massachusetts, USA: MIT Press.

Skinner, B.F. (1938). *The Behavior of Organisms: An Experimental Analysis*. New York City, New York, USA: Appleton-Century-Crofts.

Skinner, B.F. (2011). *About Behaviorism*. New York City, New York, USA: Knopf Doubleday Publishing Group.

Soloway, E., Guzdial, M., & Hay, K. E. (1994). Learner-centered design: The challenge for HCI in the 2 l st century. *Interactions, 1*(2), 36-47. https://doi.org/10.1145/174809.174813

Somaya, D., & Williamson, I. (2011). Embracing Turnover: Moving Beyond the "war for Talent". In Scullion, H., & Collings, D. (Eds.), *Global Talent Management* (pp. 74-86). Abingdon, England, UK: Taylor & Francis.

Stake, R.E. (1995). *The art of case study research*. Thousand Oaks, California, USA: Sage Publications.

Stanger-Hall, K. F. (2011). Multiple-Choice Exams: An Obstacle for Higher-Level Thinking in Introductory Science Classes. *Life Science Education, 11*(3), 294-306.

Stenbacka, C. (2001). Qualitative research requires quality concepts of its own. *Management Decision, 39*(7), 551-555. https://doi.org/10.1108/EUM0000000005801

Suddaby, R., Bruton, G.D., & Si, S.X. (2015). Entrepreneurship through a qualitative lens: Insights on the construction and/or discovery of entrepreneurial opportunity. *Journal of Business Venturing, 30*(1), 1-10. https://doi.org/10.1016/j.jbusvent.2014.09.003

Tanner, K.D. (2012). Promoting Student Metacognition. *CBE – Life Sciences Education, 11*(2), 113-199. https://doi.org/10.1187/cbe.12-03-0033

Thurmond, V. A. (2001). The Point of Triangulation. *Journal of Nursing Scholarship, 33*(3), 253-258. https://doi.org/10.1111/j.1547-5069.2001.00253.x

Tight, M. (2017). *Understanding Case Study Research: Small-scale Research with Meaning*. London, England, UK: Sage.

Tobias, S. and Everson, H. T. (2002). Knowing What You Know and What You Don't: Further Research on Metacognitive Knowledge Monitoring (Research Report No.2002-3). New York City, New York, USA: The College Board.

Tolman, E.C. (1936). Connectionism: Wants, Interests, and Attitudes. *Journal of Personality, 4*(3), 245-253. https://doi.org/10.1111/j.1467-6494.1936.tb02126.x

Tudge, J. R. H., & Scrimsher, S. (2003). Lev S. Vygotsky on education: A cultural-historical, interpersonal, and individual approach to development. In B. J. Zimmerman & D. H. Schunk (Eds.), *Educational Psychology: A century of contributions* (pp. 207-228). Mahwah, New Jersey, USA: Erlbaum.

Urban, B. (2012a). A metacognitive approach to explaining entrepreneurial intentions. *Management Dynamics: Journal of the Southern African Institute for Management Scientists, 21*(2), 16-33. Retrieved from https://hdl.handle.net/10520/EJC124757

Urban, B. (2012b). Applying a Metacognitive Perspective to Entrepreneurship: Empirical Evidence on the Influence of Metacognitive Dimensions on Entrepreneurial Intentions. *Journal of Enterprising Culture, 20*(2), 203-225. https://doi.org/10.1142/S0218495812500094

Valsiner, J. (2001). The First Six Years: Culture's Adventures in Psychology. *Culture and Psychology, 7*(1), 5-48. https://doi.org/10.1177/1354067X0171002

Venesaar, U., Ling, H., Voolaid, K. (2011). Evaluation of the Entrepreneurship Education Programme in university: A New Approach. *Amfiteatru Eco-*

nomic, 13(30), 377-391. Retrieved from https://www.researchgate.net/publication/227363741_Evaluation_of_the_Entrepreneurship_Education_Programme_in_University_A_New_Approach

Vlastos, G. (1982). The Socratic Elenchus. *The Journal of Philosophy, 79*(11), 711-714. DOI: 10.2307/2026548

Vlastos, G. (1985). Socrates' Disavowal of Knowledge. *The Philosophical Quarterly, 35*(138), 1-31. DOI: 10.2307/2219545

Von Glasersfeld, E. (1984). An Introduction to Radical Constructivism. In P. Watzlawick (Eds.), *The invented reality* (pp. 17-40). New York City, New York, USA: Norton.

Vygotsky, L. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, Massachusetts, USA: Harvard University Press.

Webb, J.W., Ireland, R.D., Hitt, M.A., Kirstruck, G.M., & Tihanyi, L. (2011). Where is the opportunity without the customer? An integration of marketing activities, the entrepreneurship process, and institutional theory. *Journal of the Academy of Marketing Science, 39*(4), 537-554.

Weber, E. (2009). Quantifying Student Learning: How to Analyze Assessment Data. *Bulletin of the Ecological Society of America, 90*(4), 501-511. DOI: 10.1890/0012-9623-90.4.501

Whiteley, T.R. (2006). Using the Socratic Method and Bloom's Taxonomy of the Cognitive Domain to Enhance Online Discussion, Critical Thinking, and Student Learning. *Developments in Business Simulation and Experiential Learning, 33*, 65-70. Retrieved from https://pdfs.semanticscholar.org/d99d/a100a47b1342478e0ca3b1c895d23ce3e556.pdf

Winn, W. (1990). Some implications of cognitive theory for instructional design. *Instructional Science, 19*(1), 53-69. https://doi.org/10.1007/BF00377985

Winne, P. H. (1985). Cognitive processing in the classroom. In T. Husen & T. N. Postlethwaite (Eds.), *The International Encyclopedia of Education*, *vol. 2* (pp. 795-808). Oxford, England, UK: Pergamon.

Wood, M. (2003). *Making Sense of Statistics: A Non-Mathematical Approach*. London, England, UK: Macmillan International Higher Education.

Woolfolk, A.E. (1990). *Educational psychology* (2nd ed.). Englewood Cliffs, New Jersey, USA: Prentice Hall.

Woord, R., & Bandura, A. (1989). Social cognitive theory of organizational management. *Academy of Management Review, 14*(3), 361-384. Retrieved from http://www.jstor.org/stable/258173

Yin, R. K. (1994). *Case study research: Design and methods. Applied Social research methods Series Vol. 5*. Thousand Oaks, California, USA: Sage Publications.

Zizzo, D. J. (2010). Experimenter demand effects in economic experiments. *Experimental Economics, 13*, 75-98. https://doi.org/10.1007/s10683-009-9230-z

Zohrabi, M. (2013). Mixed Methods Research: Instruments, Validity, Reliability and Reporting Findings. *Theory and Practice in Language Studies, 3*(2), 254-262. doi:10.4304/tpls.3.2.254-262

Appendix 1: Mac Items

Goal Orientation
I often define goals for myself
I understand how accomplishment of a task relates to my goals
I set specific goals before I begin a task
I ask myself how well I've accomplished my goals once I've finished
When performing a task, I frequently assess my progress against my objectives
Metacognitive Knowledge
I think of several ways to solve a problem and choose the best one
I challenge my own assumptions about a task before I begin
I think about how others may react to my actions
I find myself automatically employing strategies that have worked in the past
I perform best when I already have knowledge of the task
I create my own examples to make information more meaningful
I try to use strategies that have worked in the past
I ask myself questions about the task before I begin
I try to translate new information into my own words
I try to break problems down into smaller components
I focus on the meaning and significance of new information
Metacognitive Experience
I think about what I really need to accomplish before I begin a task
I use different strategies depending on the situation
I organize my time to best accomplish my goals
I am good at organizing information
I know what kind of information is most important to consider when faced with a problem
I consciously focus my attention on important information
My intuition tells me when a given strategy I use will be most effective
I depend on my intuition to help me formulate strategies
Metacognitive Choice
I ask myself if I have considered all the options when solving a problem
I ask myself if there was an easier way to do things after I finish a task
I ask myself if I have considered all the options after I solve a problem
I re-evaluate my assumptions when I get confused
I ask myself if I have learned as much as I could have when I finished the task
Monitoring
I periodically review to help me understand important relationships
I stop and go back over information that is not clear
I am aware of what strategies I use when engaged in a given task
I find myself analyzing the usefulness of a given strategy while engaged in a given task
I find myself pausing regularly to check my comprehension of the problem or situation at hand

I ask myself questions about how well I am doing while I am performing a novel task
I stop and reread when I get confused

Appendix 2: Learning Diary Questions

Lesson	Questions	Lesson Contents
1	Tell about yourself and why you decided to attend this course? What is the best way for you to learn? Describe the reasons that make you learn better. What is entrepreneurship, in your opinion?	Introductions; Bloom's Taxonomy, Socratic Method, Metacognition, Microeconomics, Factors of Production, Knowledge economy;
2	What did you learn from the first session? Who is an entrepreneur and what qualities do they have? Why some people become entrepreneurs, and some don't?	Entrepreneurial Behavior, Entrepreneurial Personality Traits, Entrepreneurial Thinking
3	What did you learn from the second session? How can a person become an entrepreneur? How to learn entrepreneurship? How can education help develop entrepreneurs?	First half of the lesson is devoted to reflecting on what has been covered to form a holistic picture about entrepreneurship and entrepreneurial learning, and the second half is devoted for students to come up with any entrepreneurial idea of their choice.
Questions after the last session	What did you learn from the 3rd session? What did you learn from the whole course? What do you think about your own entrepreneurial mindset after the course?	
Course feedback questions	What did you like in this course? What could be done better/added to the course?	