

Preparing undergraduate students for lifelong learning

lessons learned from entrepreneurship education

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Publication date

2022

Document Version

Final published version

[Link to publication](#)

Citation for published version (APA):

Timmermans, A. N. (2022). Preparing undergraduate students for lifelong learning: lessons learned from entrepreneurship education. <https://nrl.northumbria.ac.uk/id/eprint/50143/>

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Preparing undergraduate students for Lifelong Learning,

Lessons learned from Entrepreneurship Education

A mixed methods study for the provision of a
Professional Doctorate
Entrepreneurship, Innovation and Strategy

Northumbria University
Faculty of Business and Law
Newcastle, UK

Anoesjka Natasja Timmermans

2022

Abstract

Doctorate of Business Administration

Preparing Undergraduate Students for Lifelong Learning
Lessons learned from entrepreneurship education

By Anoesjka N. Timmermans
June 2022

This thesis presents an exploration of 'how entrepreneurship education pedagogy can enhance undergraduate business students' autonomous motivation for self-directed learning'. It has twin, equally valuable, purposes: to make an original theoretical contribution and to improve professional practice in this area. The work addresses the lack of pedagogical research in entrepreneurship education that focuses on learner development, with a specific aim at development of self-directed learning skills for lifelong learning.

The research is approached with a concurrent, mixed methods design, comparing pre- and a post-EE, self-assessment survey results from 245 students, enrolled in a Young Enterprise venture creation programme, and a control group at a Dutch university. With the use of open-question surveys among the same population, during and after the EE modules, as well as from focus group discussions with a selection of participating students and teachers, explanation was sought for the observations drawn from the quantitative study.

Significant relationships were found between students' self-reported maturity of autonomy, self-efficacy, and motivation for learning, and in how these relate to self-directed learning readiness. Entrepreneurship education was found to significantly moderate the relationship between the learning characteristics and self-directed learning, and to strengthen of the students' perceived readiness for self-directed learning. Explanation for the impact of EE were found to be related to the stage-wise, mixed pedagogy approach to learning, that combines authentic learning with a hierarchical approach to competence development, and supportive team dynamics.

The research contributes to practice with a proposed conceptual framework for understanding how to prepare for self-directed learning readiness and a teaching-learning framework for its development in formal educational settings. It contributes to knowledge with its deeper understanding of how students experience learning in EE and how that affects their willingness to pursue learning opportunities.

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Abbreviations

3E	European Entrepreneurship Educators
AMSIB	Amsterdam School of International Business
AACSB	Association to Advance Collegiate Schools of Business
BSI	Business Scale-up Internationalisation
CCE	Co-Creative Entrepreneurship
ETS	End Term Survey
EC	European Commission
ECSB	European Council for Small Business and Entrepreneurship
EE	Entrepreneurship Education
FRI	Free Response Item
HEI	Higher Education Institution
IB	International Business
ILO	Intended Learning Outcome
JACP	Junior Achievement Young EnterpriseProgram
LLL	Lifelong Learning
MTS	Mid Term Survey
NSEE	National Survey of Entrepreneurship Education
OECD	Organisation for Economic Co-operation and Development
PDW	Practitioner Development Workshop
PLG	Personal Learning Goal
PPC	Person Process Context
PRO	Personal Responsibility Orientation
SDL	Self-Directed Learning
SDLLLR	Self-Directed Lifelong Learning Readiness
SDLR	Self-directed Learning Readiness
SFG	Student Focus Group
SME	Small Medium Sized Enterprise
SSDL	Mixed Self-directed Learning
TFG	Teacher Focus Group
VCP	Venture Creation Program
WEF	World Economic Forum

Acknowledgements

Completing this challenging research journey would not have been possible without the Amsterdam University of Applied Science's funding and facilitation, for which I am deeply grateful, with a special thanks to John Sterk – who granted me permission in his role as Dean of the Amsterdam School of International Business and to Dr Lori Divito in her double role as Research Director of the Amsterdam School of International Business and as my secondary supervisor.

I wish to thank all the students at the Amsterdam School of International Business who have participated in this research, sharing their experiences in the various surveys and discussions. I thank my colleagues, Andro Bottse, Rob Hagen, Jose van Eeuwijk, Sara Rueda, Audrey Gran Weinberg, Marcel Aarts, Heleen Oudman, and Tino Zwiers, who shared with me with their valuable insights and experiences in teaching in the researched modules, and Reynt-Jan Sloet van Oldruytenburg, for his contributions in his role as module coordinator / programme director.

I wish to express my gratitude to Dr James Cunningham for his consequent valuable feedback as my principle supervisor at Northumbria University, to Dr Gary Bosworth for helping me bring this research to a successful closure when he took over the principle supervision from Dr Cunningham in the final phase of my research journey, to Dr Gillian Forster in her role as my secondary supervisor at Northumbria University for getting me started, for helping me adapt to a constructionist tone of voice and for her supervision along the way. I wish to thank Dr Andrew Robson and Dr Eustathios Sainidis for their feedback and encouragement, and Prof. Dr David Rae and Dr Peter Pease for their detailed, constructive feedback upon the examination.

My deepest gratitude is expressed to my children, Yanika and Nils Einholz, for sacrificing quality time with me and giving me the time and space to concentrate on this doctorate whilst they were going through such an important phase in their own lives, progressing from child into adult. I am grateful to my closest friends Dr Saya Videler, Marlous Broekhuizen, Ineke de Boer and Miranda Bakker for supporting me and believing in me, for listening to me and for asking critical questions that helped me look at issues from a different angle, for encouraging me when things were tough and I doubted myself, for accepting that I wasn't the friend for them that I could have been, if not preoccupied with this challenging research. And I thank all others whom I have not mentioned, but who have supported me and or have been affected by my work on this research.

Declaration

I declare that the work contained in this thesis has not been submitted for any other award and that it is all my own work. I also confirm that this work fully acknowledges opinions, ideas, and contributions from the work of others.

The work was done in collaboration with the Amsterdam School of International Business, Amsterdam University of Applied Science, The Netherlands.

Any ethical clearance for the research presented in this thesis has been approved. Approval has been sought and granted by the Faculty Ethics Committee on 01-06-2020.

I declare that the Word Count of this Thesis is 60.305 words

Name: Anoesjka N. Timmermans

Signature:

Date: 28 June 2022

Prologue

Embarking on a journey towards becoming international business professionals, two undergraduate BBA students, Jack and Henry, meet each other in their first year, as they team up in their compulsory, semester long, entrepreneurship module. Prior to joining the BBA programme, they both graduated from high school with an honour's grade list. Neither one has experience with entrepreneurship, but considering the international business programme, they are eager to learn. In the entrepreneurship module they are tasked to start, run, and liquidate a real company with a team of classmates they have not met before. The company is to be founded upon an opportunity identified or created by themselves, so really starting from scratch. The module accounts for a substantial 8 ECs (of their 60EC first year study programme), so the stakes are high. Guidelines and instructions for the learning task in the module are limited and formulated in such a way that they are rather open for interpretation. The main objectives of the module are broadly described as 'to develop students' understanding of the coherence of the business and management related study modules of the BBA programme, and to develop and apply entrepreneurial competencies by starting, running and liquidating a company'.

Jack bursts with self-confidence, having played sports at high level most of his youth. He immediately feels comfortable in the new class and proposes multiple ideas about how to approach learning tasks, actively discusses benefits and disadvantages of ideas and propositions of himself and others, welcomes and responds confidently to arguments from team members and reaches out to people within and outside the educational context to validate his assumptions and approaches. Out of school Jack connects with representatives of the real-world context and gathers information about what is needed to succeed. He actively experiments with activities to discover what works and what not. Jack shows high levels of energy and engagement, and seems to enjoy trying new things, even if they turn out to be unsuccessful. In doing so, he comes across as highly knowledgeable to others.

Henry is more the introvert type. He has plenty of ideas of his own, but he chooses not to share them in the class discussion at the beginning of the module, which has the other students already quite enthusiastic about some of the other students' ideas. Instead of speaking up to add his own ideas to the discussion, intimidated perhaps by the dominance of a fellow student like Jack, or simply not being the type of person to take centre stage in a discussion with people unknown to him, Henry chooses to join one of the ideas being discussed even though he doesn't believe much in its feasibility.

As the module progresses and the learning tasks require more out-of-school activities and involvement of external stakeholders, Henry feels more and more reluctant to undertake the learning activities, which he considers representing a high risk of failure. With each activity that involves such risk of failure, Henry grows more insecure and becomes less motivated to participate in the process. As time progresses, Henry tends to ask for support and more clearly defined instructions for the tasks to be accomplished more often. In the team discussions Henry tends to withdraw to the background, which may go unnoticed by the teacher, who may have considered him simply to be more introvert as he does complete the tasks assigned.

Jack, having enthused a team of classmates to adopt his idea, is likely to take on a role as the team leader, maximising his learning potential, whereas Henry may choose or be forced into a more passive, supportive role, possibly wishing he could have skipped or compensated this module.

Whilst both students are high achieving students and both participate in the same (entrepreneurship) education programme, Jack is obviously much more ready to be self-directed in this context, feeling self-efficacious to act autonomously and motivated to challenge himself and the team to realise the business idea, initiating and undertaking learning activities to achieve his goals. Henry, even if perhaps equally enthusiastic at the start of the module, may have completely lost his confidence and motivation in this context. Instead of taking a lead, this student may gradually rely more and more on others and is focused on just obtaining the credits for the module.

Realising that experiential learning can have such a varying effect on students' self-confidence, and that this may affect their willingness to pursue learning opportunities, calls for enhanced knowledge about how students experience learning in EE and how this relates to their autonomous motivation for learning.

The currently much promoted pedagogy to entrepreneurship education is that of venture creation projects, which tend to require quite strong levels of self-determination and self-direction. Because the levels of such learner characteristics vary greatly among undergraduate students, the effectiveness of the education tends to vary too, this research aims to discover what can be learnt from various pedagogical approaches applied in entrepreneurship education programmes. Special interest is given to educational programmes that combine or mix pedagogical approaches to match with students' skill levels to reduce variance between levels of self-determination and self-directedness.

Executive Summary

Problem Statement

Business success and employability increasingly depend on adaptivity (Ward *et al.*, 2018), defined as “the ability to employ multiple ways to succeed and the capacity to move seamlessly among them” (Hofman *et al.*, 2014, pp. 51–52) as cited in Morris (2020). The fast changing, unpredictable labour market forces its participants to constantly acquire and develop new knowledge and skills, to proactively identify a need to change and adapt, and to do things differently than before (Byrne *et al.*, 2014 in Morris & König, 2020, p.24). This requires one to be competent for lifelong learning, something for which the practice of (business) education seems to insufficiently prepare. The consequence is a growing gap between the competences that (business) graduates obtain and those that employers seek. Aware of this growing gap, governments worldwide promote entrepreneurship education (EE), aiming not only to transform students into potential business starters, but increasingly so into more self-directed individuals, capable of creating, identifying, and exploiting opportunities for employment. No longer does entrepreneurship education focus solely on preparing learners for starting and running a business. Its scope has gradually broadened towards entrepreneurial cognition or agency, which aligns with self-directed lifelong learning. The efficacy of entrepreneurship education remains unclear though, which scholars ascribe to its pioneering character, fragmentation of programmes offered and researched, and lack of academic rigour in the efficacy studies performed.

Research Purpose

The void in the literature that is addressed with this research is to gain a more fine-grained, deeper understanding of how students experience EE and how this relates to their willingness and ability to pursue learning opportunities. The effectiveness of a stage-wise, multi-pedagogical approach to (entrepreneurship) education for the development of the self-directed learning constructs autonomy, self-efficacy, and motivation was explored among undergraduate business students.

Research Population

The population of the research comprises undergraduate international business students at the Amsterdam School of International Business (AMSIB), participating in the AMSIB version of the Young Enterprise programme (JACP), Co-Creative Entrepreneurship (CCE) and a control group consisting of students studying within the same undergraduate (BBA) programme, but in a different format of entrepreneurship

education. The variation between the EE modules in terms of pedagogies applied creates an opportunity to study the influence of various pedagogies commonly applied in EE on the development of the SDLR constructs. Studying both populations prior to and upon completion of their EE programme allowed for cross-sectional comparison to evaluate the degree of impact these programmes had.

Research Design

For this research, aiming to develop a practical organisational framework for evaluating curricula designed to prepare learners for self-directed lifelong learning, a mixed methods quasi-experimental design was adopted with the focus on a particular case study. A stratified-random sampling procedure was applied to select participants from three different entrepreneurship education modules at the Amsterdam School of International Business (AMSIB), a faculty at the University of Applied Sciences (AUAS).

The quantitative phase of the study was conducted using a quasi-experimental, time-series design. A web-based survey using Praioritize® software was distributed to students enrolled in the different EE modules through an announcement in each of the modules' digital learning environment (Brightspace). The survey consisted of 22 questions that gathered data on learner characteristics (motivation, confidence, and autonomy) and perceived self-directed learning readiness. To inform the survey, I drew on the Personal Responsibility Orientation SDL Scale (PRO-SDLS), a self-assessment tool that consists of 25 Likert-scale questions (Stockdale & Brockett, 2011), the SDL readiness scale (SDLRS), a self-assessment tool that consists of 58 Likert-scale questions (Guglielmino, 1977) and the EntreComp Framework (Bacigalupo *et al.*, 2016). Data was collected in two (2) phases; pre- and post-intervention of the 2021 cohort of AMSIB IB students participating in the case study JASP EE module CCE, and pre- and post-participation in a subsequent (obligatory) EE module of the AMSIB curriculum, which consists of students in other obligatory EE modules. In total $N=1667$ students were invited to take part in the research, from whom a total of $N=610$ completed surveys have been collected and analysed.

The qualitative process evaluation sought to gain a deeper understanding of how and why pedagogical approaches applied in entrepreneurship education might, and might not, have the desired effect on learners' autonomy, self-efficacy, and motivation for self-directed learning. Data collection for this purpose was realised through conducting open question surveys to participants in the quantitative research as well as semi-structured individual and focus group interviews with experts, students, and teachers. The qualitative data strand was analysed using template analysis, a-priori

coded with elements identified in the self-directed learning literature to influence the development of self-directed learning readiness and completed with lower-order codes indicative of influences deducted from the template analysis.

With the aim of this research being to identify and gain explanatory understanding of the correlation between entrepreneurship education and self-directed learning readiness, both data strands (quantitative and qualitative) were collected from the same population and been given equal priority. Both data strands have been analysed separately and integrated in the interpretation phase.

Results:

The results confirmed a statistically significant, positive relationship between the learner characteristics of autonomy, self-efficacy and motivation and self-directed learning readiness and a significantly (positive) moderating impact of entrepreneurship education. Dominant explanations found for the impact of the studied EE programmes are their existential, authentic, contextualised formats, which allowed the students for real-world experiences. The data shows that self-efficacy is the strongest predictor of the three constructs for self-directed learning readiness and that its predictive value increased to > 60% upon completion of the entrepreneurship education modules. This significant increase was explained in the qualitative data strand by the effect of experiencing success or failure in the existential learning experience, especially in the unique situation of having to start a student-venture in the midst of the Covid-19 imposed lockdown of society. The results also confirmed the positive effect of a stage-wise, mixed pedagogical approach to teaching-learning, that gradually builds student confidence and 'forces' them to apply what is learned in the existential, authentic setting within and throughout the learning module. For this a practical teaching-learning framework is proposed that builds upon SDL literature, educational theory, and contemporary teaching-model frameworks in the EE literature, and which enables educators to select sequential learning activities to gradually build competence.

Practical implications

The implication of implementation of the proposed teaching-learning framework for self-directed lifelong learning readiness is that the role of the educator changes from being either a lecturer, a coach, or a supervisor to being all of these roles plus those of a tutor, a moderator and an organiser. Switching continuously between these roles, in relation to content as well as to process, not in subsequent academic years or modules, but in every step of the competence development process within the module. To continuously change and match teaching style and activity with students' needs

requires faculty to be qualified all-round and attentive to individual student needs. Learning activities should be developed that not only reflect the context for which is educated, but represent that context, with authentic stakeholders and authentic consequences of student activities. These learning activities should be radically different from what students and educational institutions are currently acquainted with, and should be combined with more traditional, in-class activities, frequently reflected upon, and offered in such a flexible format that students can iterate between them.

Originality/value

The research makes novel contributions to the literature on entrepreneurship education by providing a deeper understanding of how students experience learning in entrepreneurship education programmes and how this relates to their willingness to pursue learning opportunities. It makes an important contribution by empirically studying the impact of the venture creation programme as part of an obligatory study programme, and the moderating effects of this on self-efficacy and self-directed learning readiness. In doing so, this research contributes to a stronger embedding of entrepreneurship education research in educational science. The proposed organisational framework for developing and evaluating learning activities that aim to enhance learning competences and entrepreneurial agency expands upon earlier efforts to align EE pedagogy with the various educational theories.

It is novel to conceive of entrepreneurship education as an exercise to transform instruction-dependent learners towards self-directed learners.

Key words

Self-directed learning readiness, pedagogy, entrepreneurship education, autonomy, self-efficacy, motivation.

1 Origins of this study

Europe's dynamic knowledge economy demands its participants to be flexible, self-directed, and able and willing to continuously invest in their own professional development (Mulcahy, 2019; OECD, 2020, 2017; Levy, 2018; WEF, 2018; EPSC, 2016). European policymakers advocate the need for development of what are now known as "21st century skills", such as critical thinking, creativity, entrepreneurialism and lifelong learning (LLL) as coping strategies for employability in this dynamic labour market (European Commission, 2018a, 2018b; EPSC, 2016). This has led to Higher Education Institutions (HEIs) broadly introducing curriculum-changes to include students' personal and professional development of these 'new-to-the-market' skills, applying a variety of social-constructivist and context-based learning strategies. Recent research indicates that the gap between graduates' attained professional skills and competencies and the requirements of the labour market continues to grow (Chamorro-Premuzic and Frankiewicz, 2019; Mulcahy, 2019; OECD, 2020), which shows that adequate preparation for the dynamic labour market demands remains an enormous challenge for educators. To close the gap, HEIs around the world are embracing entrepreneurialism, introducing entrepreneurship courses and modules and becoming entrepreneurial as universities themselves.

The challenge of preparing for the dynamics of the labour market is accentuated by the rapid decrease of the half-life¹ of knowledge (Siemens, 2005; Downes, 2009; Arbesman, 2012, 2013) and skills (LaPrade *et al*, 2019). The rapid developments of knowledge in combination with the rapidly changing skills requirements calls for frequent competence evaluation and critical (self-)reflection, continuous identification and closing of potential knowledge/skills gap, and therefore autonomous motivation to engage in a learning process (De La Harpe and Radloff, 2010).

One may argue that preparing students to be self-critical and self-directed towards learning would be highly beneficial to their lifelong employability. The self-directed learning theory profiles self-directed learners as able and willing to constantly reflect upon their competence and initiate and manage learning activities when needed. The education literature voices concern that such self-critical, self-directed behaviour towards learning is insufficiently adopted in formal education, as research reveals that schools, including HEIs, tend to lag in adopting more constructivist or connectivist

¹ The half-life of knowledge or skills is defined as the time span from when knowledge or skills is gained to when half of it becomes obsolete (Siemens, 2005; Downes, 2009).

philosophies of learning (Giddings, 2015; Siemens, 2005; Downes, 2009; Doolan, 2013; Conradie, 2014).

Being an educator myself and having specialized in experiential learning within the domain of entrepreneurship education, I began to wonder how educational programmes might be made more effective to transform instruction dependent learners into more self-directed individuals. What, for example, can possibly be learned from education that prepares students to become entrepreneurs, considering that “entrepreneurship [too] is a process of [self-directed] learning” (Minniti and Bygrave, 2001 p.7). Company founders may prove to be the best example of lifelong learners, as they ‘continuously learn and develop [in relation to his/her business and the wider environment]’ (Cope, 2005, p.3). Even more so than employment in the dynamic, global knowledge economy, entrepreneurship requires continuous reflection on what is, and anticipation on what might become; about experimenting with, and learning from what works and what not; and about creating, exploring and exploiting opportunities to close (market) gaps; by taking charge of gathering and managing resources, including knowledge, to achieve goals, and by taking proactive action to initiate and manage a (self-)development process (Bacigalupo *et al.*, 2016). Becoming aware of the resemblance between these two profiles triggered my motivation to investigate the potential efficacy of entrepreneurship education for the purpose enhancing lifelong learning readiness, by means of this doctoral research study.

1.1 Background

Entrepreneurship Education to promote self-directed learning skills

Lifelong learning has been conceptualized as being concerned with promoting skills and competences necessary for developing general capabilities and specific performance in work situations, tackling of precise job responsibilities, and adapting general and specific knowledge and competences to new tasks [or changing requirements for tasks] (Aspin and Chapman, 2001). Because the content of what needs to be learned is both circumstantial and individual, lifelong learning requires a well-developed degree of individual self-determination or self-direction (Candy, 1991; Boyer, 2013). The literature of adult education identifies self-directed learning (SDL) as a major factor in fostering the skills and capacities for lifelong learning (Taylor, 2006). In 2019, the European Union published a revision of the key competences for lifelong learning, which include ‘learning to learn’ and entrepreneurship, by means of the entrepreneurial mindset, as two of the key competences for lifelong learning, enhancing resilience through the ability to adapt to change (European Commission, 2021; 2018b).

The lifelong learning competence of learning-to-learn is defined as “*the ability to identify one’s capacities, focus, deal with complexity, critically reflect and make decisions*” [including] “*the ability to learn and work both collaboratively and autonomously and to organise and persevere with one’s learning, evaluate and share it, [and] seek support when appropriate*” (EU 2019, p.11). Entrepreneurial skills, the report mentions, “are founded on creativity, which includes imagination, strategic thinking and problem-solving, and critical and constructive [self]reflection within evolving creative processes and innovation” and need to supplement with a positive attitude towards taking initiative and agency, being pro-active and forward-looking, and showing courage and perseverance in achieving objectives” (p.13).

To support and inspire actions to improve the entrepreneurial competence of European citizens, and to create a shared understanding of the knowledge, skills and attitudes needed to become entrepreneurial, the European Commission introduced the European entrepreneurship competence Framework (EntreComp). The EntreComp Framework defines the entrepreneurial competence in terms of spotting opportunities, vision, ethical and sustainable thinking, valuing ideas, motivation, and perseverance, mobilising resources, learning through experience, planning and management, the scope of which attribute to a competence for life and learning, relevant not only for initiating new ventures, but equally so to finding and progressing in employment (European Commission, 2021). To enhance learning outcomes and learner engagement, the EU (2019) policy paper recommends educators to adopt competence-oriented teaching approaches such as project based, arts based, inquiry based, experiential or work-based learning (p.15). With the COSME funding 2020-2023, the European Commission aims to support full-speed development of the entrepreneurship competences at local, regional, and national level, including through substantial [educational] curricula reform towards such competence-oriented teaching approaches.

The apparent need for curricula reform might be grounded in the concern with the consistently dominant, instruction-directed, behaviourist learning philosophy applied in most (H)EIs, which seems to insufficiently transform students into self-directed (Morris, 2019; Murtonen *et al.*, 2017; Giddings, 2015; Guglielmino, 2013), entrepreneurial, lifelong learners (Robinson *et al.* 2016). Instead of treating learning as a personalized, reflective development process, the dominant de-contextualized and de-subjectivized discourse of education treats learning as a unidirectional process, that originates in, and is controlled by, the instructor or institution (Robinson *et al.*, 2016; De La Harpe and Radloff, 2010). This leaves little room for learners to discover and exploit

their personal learning opportunities, *let alone* stimulate them to do so. Transformative learning environments that stimulate learners to be self-directed are described as being student-centric, experiential- and focused on problem-solving, confronting the learners with learning situations that are of immediate value to them, in which they can develop (self)reflection (Mezirow, 1990; Brookfields, 1990) to discover why, how, and what needs to be learned (Knowles, 1975). When considering this set of criteria, a parallel can be drawn with the practice of (experiential) entrepreneurship education (Bell and Bell, 2020; Morris and König, 2020; Verzat, O'Shea and Jore, 2017; Jones *et al.*, 2019; Gabrielsson *et al.*, 2020). As Morris and König (2020) state:

“SDL competence could be viewed as a “meta-competence” that is important for, and is indeed fundamental for, proactively upskilling with an effective and efficient mannerism the necessary skills, knowledge and attitudes to meet the changing challenges and demands they face. Consequently, SDL can be seen as a fundamental and higher-order competence for entrepreneurs to meet the demands of their ever-changing business world” (p.25).

This insight makes entrepreneurship education (EE) a potential model in the educational domain for promoting lifelong learning readiness. The key concept of entrepreneurial learning is that it considers learning to be a lifelong process of experience and discovery, where knowledge is continuously shaped and revised as new experience takes place (Cope, 2005). Entrepreneurial learning transforms experience into entrepreneurial knowledge in terms of increased effectiveness in opportunity recognition and in coping with the liabilities of newness (Politis, 2005), skills deemed fundamental to lifelong learning as a coping strategy to optimize employability (Aspin and Chapman, 2001; European Commission, 2018a).

The compatibility between entrepreneurship, lifelong learning, and self-directed learning, in combination with my role as an entrepreneurship educator at an international business school, served as the foundation of my choice to design this research from these perspectives.

1.2 Problem Statement

Considering the above, and especially with governments promoting entrepreneurship education to prepare learners for a future of continuous learning and development, it seems paramount that we understand entrepreneurship education's potential effectiveness for learner transformation. Research in the field of entrepreneurship education efficacy is divided about its potential though, especially for objectives related to entrepreneurial skills and behaviour. Since the question whether, or not entrepreneurship can be taught was replaced with the questions of what should

be taught and how (Kuratko, 2005), research in these topics has gained interest from multiple disciplines, including educational science, the latter of which holds that entrepreneurship education research lacks proper embeddedness in its scientific field (Bécharde & Grégoire, 2005; Fayolle & Gailly, 2004; Grégoire *et al.*, 2006). In contemporary EE research new educational frameworks are being introduced to align educational theory with EE practice, each stating that it contributes to EE's educational professionalisation, yet acknowledging its shortcomings.

As the body of knowledge expands, criticism arises (Hagg & Gabrielsson, 2017). Increasingly scholars have begun to raise questions about the generalisability of efficacy claims of entrepreneurship education (EE) (Gabrielsson, 2020). Several systematic literature reviews that evaluate the status of our understanding of EE efficacy reveal a lack of consensus. Where many studies report positive effects of a diversity of pedagogies used in EE, others report the opposite, revealing a negative and discouraging effect of EE (eg Oosterbeek, van Praag, & Ijsselstein, 2010; von Graevenitz *et al.*, 2010). The European Entrepreneurship Educators Summit of 2021 (ECSB, 2021a) flagged this lack of consensus among EE academia as a major concern, to the degree that ECSB has issued a call for papers on the issue for the RENT 2021 conference (ECSB, 2021b).

Within the quantitative EE research domain, scholars question its rigour, emphasising the need for (more) experimental design (Longva and Foss, 2018; Bae *et al.*, 2014; Fayolle and Linan, 2014; Rideout and Gray, 2013; Lorz, Mueller and Volery, 2013; Martin, McNally and Kay, 2012; Costa *et al.*, 2021). Within the qualitative EE research domain, scholars express concern about the fragmentation of its body of knowledge. The broad range of single case, descriptive studies (Fayolle, Verzat and Wapshott, 2016) that cover a diversity of target groups, lack alignment between pedagogical approach and success indicators (Mwasalwiba, 2010; Heinnovate, 2021). Concern is expressed about weak alignment of objectives, delivery mode (pedagogy) and formation of intentions (Kamovich and Foss, 2017). Another important concern, especially considering the increasing promotion of entrepreneurship as an employability skill to be included in school curricula, is that EE pedagogy is discussed in isolation from other debates on (adult) learning theory (Pittaway and Cope, 2007), therefore lacking a strong theoretical orientation (Becharde and Gregoire, 2005).

In summary, whilst research in entrepreneurship education is abundant, academia share concern about its fragmentation both conceptually and methodologically (Blenker *et al.*, 2014). Specific comparative research on entrepreneurship pedagogy and its effect on learners is limited (Hagg & Gabrielsson, 2019; Sirelkhathim and Gangi, 2015) or contradictory (von Graevenitz *et al.*, 2010) and

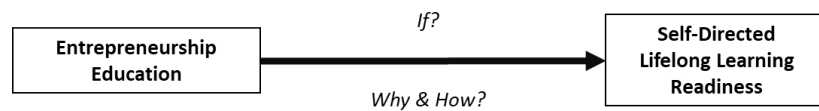
the current literature does not clearly and explicitly show the link between educational theories and EE practice (Macht and Ball, 2016). Research that deals with questions relating EE to learning behaviour is scarce (Morris and König, 2020). Even more limited is the existing research that deals with the specific question of how entrepreneurship pedagogy is related to self-directed, lifelong learning, representing a major void in the literature (Tseng, 2013; Morris, 2019). Without such understanding, development and evaluation of curricula that aim to prepare its students for self-directed lifelong learning remains an act of trial-and-error, with the potential danger of doing more harm than good.

1.3 Purpose of this study

The literature study (chapter 2) reveals that EE is a field still considered to be in its infancy, theoretically as well as in terms of its legitimacy as a research domain (Bécharde & Grégoire, 2005; Grégoire *et al.*, 2006; Kuratko, 2005; Shane & Venkataraman, 2000) and continues to be evolving rapidly. These dynamics pose several challenges for practitioners and scholars. One such challenge is concerned with the underdeveloped interface between entrepreneurship and education, linking EE to established and proven educational frameworks (Becharde and Gregoire, 2005; Fayolle, 2013; Jones *et al.*, 2014; Robinson *et al.*, 2016, Macht and Ball, 2016). Especially where the literature is concerned with evaluation of EE efficacy, most studies tend to have applied economic and innovation theories, and psychological outcomes such as attitudes towards (intention of) starting a business and development of entrepreneurial competencies related to starting or running a business (Gabrielsson *et al.*, 2020). Relatively few studies have been conducted to evaluate EE in relation to academic performance (Johansen, 2014), and as indicated above, studies relating EE to self-directed and/or lifelong learning readiness represent a void in the EE literature, making this study a novel contribution.

1.4 Research Question and objectives

The objective of this doctorate study is to explore the possible EE-SDLLLRR relationship. Its overarching research question is therefore “How can entrepreneurship education contribute to preparing students for (self-directed) lifelong learning readiness?”.



The research question is underpinned by the following research objectives:

1. To critically review the literature on entrepreneurship education efficacy and self-directed learning to identify the main theories, methodologies and methods applied. Additionally, these literatures are reviewed to discover important variables indicative of self-directed learning readiness and entrepreneurial competence; to evaluate assessment instruments used in correlational research to study the relationship between variables and in comparative research to study differences between groups; and to identify criteria that are considered supportive of teaching for self-directed learning readiness, to facilitate the in-depth study of students' experience with the various entrepreneurship pedagogies, using multiple data sources.
2. To design and apply an appropriate research instrument to explore the impact of various approaches to entrepreneurship education and related determinants on promoting autonomy, self-efficacy and motivation for self-directed learning, and the mediating effect of the social context in which the learning takes place.
3. To construct an organisational framework for the development of pedagogy that promotes self-directed learning readiness; and
4. To advance the current body of knowledge with the results of this study within the EE literature.

The study adds a holistic assessment framework for monitoring progression of self-directed learning competence (autonomy, self-efficacy, and motivation) in (entrepreneurial) education to practice. The holistic assessment framework can be used by the learner him/herself as well as peers or instructors, indicating verifiable behaviours that represent maturity levels of learner autonomy, self-efficacy, and motivation for engaging in and managing challenging, self-directed learning activities in different stages of the entrepreneurial development process. The assessment framework was developed to complement the currently available (self)assessment

tools, which predominantly depend on Likert-scale questionnaires addressing self-perceived attitudes and behaviours (questioned as “I can”) towards learning (Guglielmino, 1977; Oddi, 1986; Stockdale & Hiemstra, 2003) and entrepreneurial competence (Bacigalupo, 2016; Driessen, 2005). No assessment framework was found that assesses self-directed learning readiness using verifiable (observable) behaviours.

1.5 Nature of the study

A mixed-methods, quasi experimental case study design was used in which qualitative and quantitative data was collected and analysed. The quasi-experimental design type was applied to test the potential effectiveness (the *if*) of a mixed-pedagogical approach to entrepreneurship education, as applied in the venture creation project (VCP) Co-Creative Entrepreneurship (CCE), to enhance learner’s self-directed learning readiness for undergraduate international (IB) students at the Amsterdam School of International Business (AMSIB). The VCP CCE serves as the case study for this research, representing the widely applied EE module of Young Enterprise by the Junior Achievement organisation (JA, 2021). Qualitative data was collected from students, teachers, and EE experts, using focus group discussions and a semi-structured individual interview was held with the course director. In addition, two evaluation surveys were used to collect qualitative data. The collected qualitative data has been embedded in the larger study design upon completion of the analysis of the quantitative data, for the purpose of explaining potentially found correlations. The qualitative data explores *why* and *how* a mixed-pedagogical approach to (EE) learning affects self-directed learning readiness differently than a single, self-steered approach to EE, for the undergraduate IB students at AMSIB. The qualitative results were combined with the quantitative outcome results to gain an in-depth understanding of what works, why and how in mixed-pedagogical approaches to EE, as applied in taught and supervised VCPs such as Young Enterprise. The aim is to use this deeper understanding to develop a practical framework that educators can use to develop, organise, and evaluate learning tasks and match the level of instructor involvement with students’ task readiness, to optimise students’ self-directed learning readiness.

The envisioned organisational framework gains its validity through an empirical evaluation of the effect of various pedagogical approaches used in EE, particularly in the setting of university based experiential learning settings, on attitudes and behaviours indicative of self-directed learning readiness, which is strongly connected with lifelong learning readiness.

The focus of the study is on undergraduate (business) students in a compulsory EE setting as opposed to an elective EE module to avoid self-selection bias. The

contribution to knowledge of pursuing this scholarship includes a better understanding of the entrepreneurship education - self-directed (for lifelong) learning relationship in the context of a compulsory undergraduate international business programme, of which empirical evidence is currently lacking.

The case study is a compulsory, single-semester adaptation to the (full-year) Young Enterprise Programme, taught to approx. 700 first year university level students at the Amsterdam School of International Business (AMSIB) each year. The Young Enterprise programme (JACP) is broadly taught around the world and serves as the foundation of many entrepreneurship programmes. In this experiential learning programme students learn about, for and through entrepreneurship through a combination of lectures, workshops, and the existential experience of starting, running and liquidating a real venture (JACP, n.d.). JACP is such a dominant programme in the field of EE that scholars refer to it as “the original burger”, presuming that EE has standardized upon its model to such a degree that we could speak of “MacDonaldization” of EE (Brentnall *et al.*, 2021), making it the most representative case study for the purpose of this research.

1.6 Data collection and Sampling

The quantitative data is collected sequentially (pre- and post-intervention) using a 22-question Guttman-scale survey questionnaire, which has been developed specifically for this research, to assesses students’ self-perceived behaviours reflective of autonomy, self-efficacy, motivation for and engagement in the module, as well as their (continued) learning behaviour beyond the requirements of the module.

The main sample ($N=328$) consists of first year (undergraduate business) students in the JACP based module. Two control groups have been included in the study; one group of first year students in a different, more theoretical programme, participating in a non-experimental module *about* governance, sustainability and entrepreneurship ($N=22$), and one group consisting of second year (undergraduate business) students participating in a self-driven, practical module in which they learn *for* entrepreneurship ($N=84$), tasked to create a business plan to scale a national business to an international market. All participants are undergraduate students at the Amsterdam School of International Business participating in a compulsory entrepreneurship programme. An additional control group was added consisting of 26 students participating in an elective, self-driven, practical entrepreneurship module in which students are tasked to solve a strategic business problem for an existing (SME) company.

The qualitative data is collected throughout 2 academic years (2019-2020 and 2020-2021). At half-term, a 9-question, Likert-scale, and 6-free response items to explain the answers given to the Likert-scale questions, survey was distributed among the participants in the pre-intervention survey who had indicated their willingness to participate in the follow-up research. A sub-sample ($N=146$) of the respondents in the pre-test sample ($N=328$) took the survey questionnaire developed to determine the effect of specific pedagogies (theoretical lectures and in-class participative workshops) on students' willingness and confidence to participate in the experiential learning activities, which involve proactive engagement with external stakeholders.

Empirical data was collected from a subsample of students ($N=83$ and $N=155$) by means of free response item surveys distributed via personalised emails to the participants of the pre-intervention survey. Two focus group interviews were held in Zoom, using a Miro board to guide the discussion about what influences autonomy, confidence, and motivation. One focus group session was held with a selection of student and the other with a selection of teachers. The modules studied have been described and analysed in accordance with Fayolle and Gailly's (2008) teaching model framework for EE and evaluated using Bird's (2002) framework for teaching for SDL in EE.

1.7 Theoretical framework

Two theories applicable for deducting student motivation for lifelong learning in relation to classroom practices are self-determination theory (SDT) and self-directed learning theory (SDL).

1.7.1 Self-Determination Theory

Self-Determination Theory (SDT) theorises that human behaviour may be explained by intrinsic and extrinsic motivation factors (Deci & Ryan, 1985). SDT proposes that autonomous motivation is promoted through a process of identification and integration, in which a person has freedom of choice and maintains control over the outcome of a decision (Deci & Ryan, 1985). As such the factors control and choice are key determinants for self-determination. Human beings are conceived as innately constructive, growth-oriented organisms with a natural tendency to seek, and voluntarily engage in, challenges to enhance their human potential (Deci and Ryan, 2002, 1995, 1991; Ryan and Deci, 2000). SDT postulates that humans are determined

to satisfy a set of basic psychological needs, predominantly the need for autonomy, competence, and relatedness (Deci and Ryan, 2002). Applied to educational settings, empirical SDT work concludes that autonomously motivated students thrive in educational settings in which 1) teachers support their autonomy by enabling choice regarding activities and goals; 2) students feel effective and capable to achieve their goals and to interact with the social (learning) environment, and 3) students feel 'closely related' to others in the learning environment (Reeve, 2002). The theory emphasises that motivation to learn can vary in its relative autonomy, ranging from behaviours stimulated by external reward and punishment (controlled motivation) to those that are energized by interests and values (autonomous motivation) (Van Gelderen, 2011, p.50).

1.7.2 Self-Directed Learning Theory

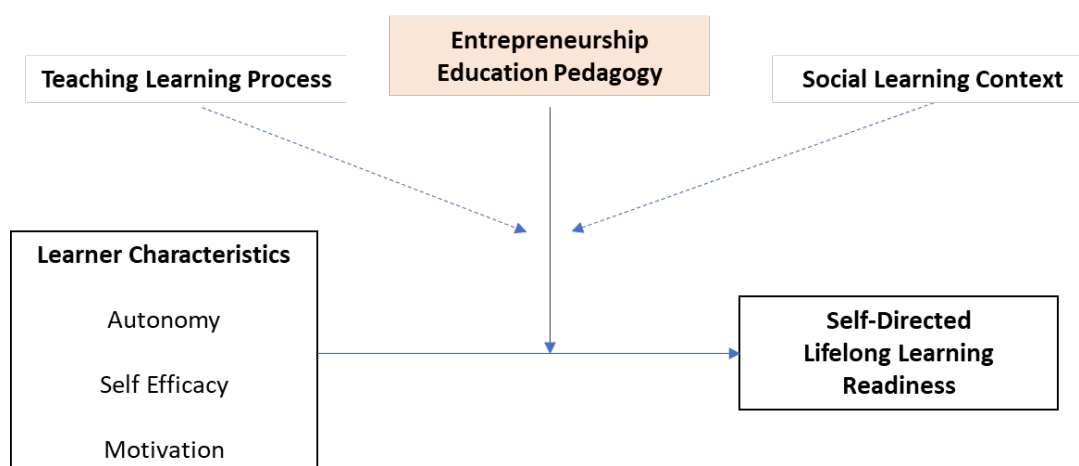
Self-directed learning (SDL) starts from the angle that learners are self-determined, having satisfied their need for autonomy, confidence, and relatedness to the degree that they can independently initiate, plan and manage a learning process. The theory finds its origin in adult education, termed andragogy by Knowles (1975). According to the andragogy theory, adults are capable of critical self-monitoring. Adults are postulated to be self-determined, self-directed, and autonomously motivated to take responsibility for decisions, including their own learning. Regarding the design of learning, andragogy proposes that adults know why they need to learn something, that they need to learn experientially, that they approach learning as problem-solving, and that they learn best when the topic is of immediate value to them (Knowles, 1984).

Bringing these two theoretical propositions together with the intent to explore how to prepare students in (higher) education for self-directed lifelong learning, the proposition of this doctoral study is that (higher education) learning programs should accommodate students to feel self-efficaciously engaged in a collaborative learning process in which there is sufficient room to operate autonomously upon critically self-determined learning needs.

The research proposes that lessons can be learned from entrepreneurship education due to its collaborative, experiential nature, reflective of real-world practice and the variety of pedagogical approaches and learning activities used. This proposition assumes that entrepreneurship education has a positive impact on the development of students' autonomy, self-efficacy and motivation for self-directed lifelong learning,

which is moderated by the influence of the teaching-learning process and the (collaborative) social learning context in which the education takes place.

Figure 1 Research Model



To explore these proposed relationships, the following research questions guide the qualitative part of the study:

- 1) How do various elements in the teaching-learning process affect students' autonomy, self-efficacy, and motivation?
- 2) How does the collaborative context typical of learning in entrepreneurship education affect the students' autonomy, self-efficacy, and motivation?
- 3) How is enhanced autonomous motivation expressed in enhanced self-directed lifelong learning readiness?

1.8 Delimitations

Study delimitations include organization type, geographic location, factors studied, and intent of findings. This study's limitation is that results have been gathered from undergraduate students participating in a variety of compulsory entrepreneurship education programmes within one university only, the International Business programme at the Amsterdam School of International Business (AMSIB), which is the home university of the researcher. The rationale for this choice was that initially the planned research methodology was constructivist, implementing a participant observation method to detect changes in students' behaviour that reflect self-directed learning readiness. The planned method implied intensive involvement of and collaboration with teaching staff. Participation of the teaching staff consisted of continuous observation of a sample of their students, recording behavioural indicators

using an observation framework (see appendix 5) developed specifically for this research. During the bi-weekly focus group sessions that followed immediately after the participating teachers' classes, their observations were (to be) shared with me. For this purpose, 9 teachers had agreed to participate across three days in the week, which meant that my access was needed at a collegial level and ruled out the chance to conduct this research at a university other than my home university.

In my role as lecturer in the selected programme, contact information for the selected participants was readily available. Furthermore, the connection creates depth and insight into the organization of the entrepreneurship education that otherwise might not be available through the research process.

1.9 Research motivations

The impetus for this explorative research came from my professional and personal experiences as entrepreneur and entrepreneurship educator.

Over the past 20 years I perceived a growing gap between the way we approach education and the demands from the professional world we educate for. It was especially the growing trend of self-employment and flex-employment that concerned me, as education was/is still very much focussed on preparing for (long term) employment in professions that quickly disappear or change in character. Important skills to cope with the uncertainty in the labour market, in my opinion, were those related to recognizing and creating opportunities, mobilizing knowledge, skill and resources to exploit those opportunities, and taking proactive action to realise personal goals. Skills that are commonly associated with entrepreneurship, which, in my opinion, makes sense for a career outlook in which one needs to frequently re-invent oneself to meet the demands of the fast-changing knowledge economy.

At various EE conferences and the annual JA Europe meetups, I noticed that my vision is shared by many, including the European Commission, which aims that all citizens of the EU at some point in their education have participated in an entrepreneurship course (EC, 2018). Discussions with colleagues and peers in the entrepreneurship scholarship revealed an immense diversity in approaches, objectives, and experiences, which sparked my curiosity to find out why no consensus seems to exist about how to organize, evaluate and appreciate EE, regardless its advocated significance and its broad incorporation across EU member states. When consulting the literature, I was first overwhelmed with the amount of research being conducted on

the topic, but once I discovered an increasingly critical voice in the literature, dating especially for this past decade, I realized I had an opportunity to contribute.

My preliminary investigation of the current and future challenges for employability convinced me that what graduates need, to cope with the uncertainty in the labour market, goes beyond abilities and intention to start a business. Instead, being able to discover, or create, and exploit one's own opportunities appears to be the most urgent employability skill. These typically entrepreneurial skills require willingness, ability, and self-efficacy to continuously activate and motivate oneself to autonomously plan, manage and modify mastered knowledge and skills through life-long learning. It is this insight that brought me to the theory of self-directed learning as the foundation for life-long learning, as the self-directed learning theory identifies autonomy, motivation, and self-efficacy as being key characteristics. I decided to research possibilities to enrich the educational literature with insights in how approaches to learning for being entrepreneurial might increase self-directed learning readiness for life-long learning.

My personal motivation for this challenging research comes from experiencing a decreasing tolerance for ambiguity among students, as well as a divide in students' self-efficacy and motivation as they go through a compulsory experiential entrepreneurship module at my university. The decrease of and variety in students' willingness and propensity to take risks by creating something new is noticeable, especially in comparison to previous student populations over the past 20 years of my teaching. I find students to have become much more calculated learners, more risk avoidant and even insecure, especially where it comes to experimenting with unknown situations. Increasingly so, students tend to want to know precisely what to learn, how to learn it and how to produce their results to obtain certain grades. Overall, I also see a variety in learners' self-efficacy, autonomy and motivation, which tends to grow instead of shrink as they go through the process of venture creation in their entrepreneurship module, a phenomenon also reported by Oosterbeek and Van Praag (2010).

The experiential approach to learning, taking the actual experience as the starting point for the learning process, I believe, requires trust in one's own abilities, a sense of self-efficacy that may spring from either familiarity with a relevant theoretical framework of knowledge or some degree of self-directedness to obtain such a theoretical framework. Daring to start with an experiment, with the risk of failing, is not what most young adults in formal undergraduate programmes are trained for. Instead,

their education seems focused on preparing for exams, affected by the introduction of competitive performance indicators of schools (Morris, 2019; Levy, 2018; Giddings, 2015; Rideout and Gray, 2013; Boyer *et al.*, 2014; Guglielmino, 2013), which seemingly places higher emphasis on grades, output, and school ratings at the expense of nurturing curiosity and creativeness/inventiveness. I believe this development to contribute to the experienced risk avoidance and student insecurity by the time they reach tertiary education. Especially in the entrepreneurship modules I have noticed this variety in learners' self-efficacy, which seems to be related to their motivation and autonomy too. Where some students seem to thrive in the existential entrepreneurial learning approach of experimenting, reflecting, thinking, and acting (Bailey, 1986; Johannisson *et al.*, 1998), others show the opposite, gradually losing their sense of self-efficacy and motivation, growing increasingly dependent on others. This drives my wish to explore possible causes of and solutions to this divide in self-efficacy, study motivation and (in)dependence (autonomy), to facilitate optimal benefits for all learners in a compulsory EE programme.

1.10 Organisation of the study

This study originates from the proposition that different pedagogies have different effects on students with regards to preparing them for self-directed lifelong learning readiness and that therefore lessons may be learned from entrepreneurship education. In chapter 2 a thorough review of the entrepreneurship education literature reveals its pioneering history and dynamic character, including the concerns recently raised by several scholars. Prior to determining how EE pedagogy may be effective for the development of SDLR skills, the self-directed learning literature was reviewed with the intent to operationalise the constructs used for this study. The chapter is completed with a review of the EE literature against the operationalised SDLR constructs to discover its potential efficacy for the purpose of preparing (undergraduate) students for SDLR. The chapter is completed with a review of the most frequently applied instruments to evaluate competences with the intent to determine which instrument to use for this study.

Chapter 3 explains the research methods, design, and rationale of this study. Chapter 4 presents the findings of the quantitative and the qualitative parts of this study. In chapter 5 the findings are integrated and interpreted, chapter 6 discusses the implications for the educational practice, and presents the contribution of this research to the extant literature and recommendations for further research. References for citations are included, as well as appendices with the survey questionnaires, table of instrument recoding, assessment frameworks evaluated for this research, the code

book for the quantitative data and the coding logic used for analysing the qualitative data and descriptive statistics.

2 Literature Review

Introduction

In this chapter the EE literature is reviewed to determine its key issues and methods used to teach and to evaluate the effectiveness of EE, in relation to learning-competence development. This review presents what is already known about enhancing the constructs related to SDLR (autonomy, self-efficacy, motivation) through the practice of EE (teaching-learning process and collaborative, social learning context). The intent of the review is to construct a conceptual framework that may be used to:

- evaluate the Entrepreneurship Education efficacy literature,
- evaluate the case study researched in this doctoral study,
- develop a (self)assessment framework to evaluate the students' SDLR
- develop a set of open questions for the qualitative questionnaire
- establish a coding framework for the analysis of the data
- determine the void in the literature where the outcome of this research can contribute

Reviewing the literature was as much a dynamic, evolutionary process as this research was, because of the proliferation of knowledge about entrepreneurship education in relation to competence development. In 2018, at the start of this research journey, studies that specifically addressed self-directed learning as an outcome of entrepreneurship education were scarce. Today the number of publications addressing this theme is rising as the topic of entrepreneurship education for employability and lifelong learning is gaining attention from the academic field. To avoid my own knowledge gap, the literature review progressed in several phases.

In the initial phase the SDL literature was studied to develop a conceptual framework to evaluate the EE literature in relation to self-directed learning. In the first phase of the EE literature review the focus was on establishing the state of the art and current issues in relation to self-directed or lifelong learning-competence development (2.1). Because of the limited results that focus on this specific topic, the review was expanded with studies that discuss EE pedagogy in relation to the constructs in the conceptual framework of this research, and studies that discuss alignment of EE with educational theory. This section of the review (2.2) presents the evolution, and characteristics of the various pedagogical approaches commonly applied in EE for competence

development, and evaluates different educational frameworks proposed in the forementioned studies for their potential to enhance self-directed learning readiness.

To define and operationalise the SDL constructs of autonomy, self-efficacy, and motivation into (behavioural) indicators that may be evaluated among full time students in formal (business) education, a thorough review was conducted of the SDL literature, extended with contributions from the constructivist educational science literature (2.3). To determine how to approach the primary research, existing assessment frameworks have been explored (2.4).

2.1 Evaluating Entrepreneurship Education from an Educational Science perspective

The extant literature studying impact of EE can be divided into a “narrow view”, and “wide view”. The narrow view consists of EE studies from the angle of educating for entrepreneurial action or venture creation, usually assessed with the construct entrepreneurial intent (EI). In the wide view, EE is discussed in relation to learners’ (entrepreneurial) behaviours, attributes, and qualities (Kamovich and Foss, 2017). Because the purpose of this doctoral study is to explore the EE-SDLR relationship, which is concerned with skills and behaviours related to learning, the focus of this literature review is on studies that evaluate entrepreneurship education from the wide-view perspective. To be able to identify, evaluate and synthesize the existing body of completed and recorded work produced by researchers, scholars, and practitioners on the specific topic of enhancing SDLR constructs through (entrepreneurship) education, an explicit, and reproduceable review of the literature related to entrepreneurship education, self-directed learning and constructivist education was conducted, in accordance with the guidelines of Fink (2014).

2.1.1 Review Methodology

For a review of such contributions, a literature review with a targeted search of publications was one, using the broad search terms (entrepreneur* AND pedagogy AND self-direct*) without specific timeframe indication, in the Alma/SFX Local Collection. This search resulted in 40 publications, of which 27 peer reviewed journal publications. To be able to filter the articles that discuss relationships between self-directed learning in entrepreneurship education, I scanned each of the articles’ abstracts. Only 4 articles matched these criteria and have been included for this study. To extend the literature review, three additional searches were conducted for peer reviewed articles containing autonomy AND entrepr* AND educ*; self-efficacy AND

entrepre* AND edu*; and motivation AND entrepr* AND edu* in the title. These searches resulted in respectively 2, 31 and 6 publications. After screening of each of the articles' abstracts and full content, respectively 2, 6 and 2 articles were included in the literature review. As the research process progressed additional searches were conducted. Broadening the scope of the research to include its current issues and state of the art in relation to pedagogy and alignment with educational theory, peer-reviewed journal articles that present a systematic review of the EE literature, and which were available in the Alma/SFX Local Collection were added. A targeted search (using the broad search terms entrepr* AND edu* AND systematic* AND literature AND review) resulted in 39 publications, 7 of which were used for this research. These papers were selected based on their focus on EE pedagogy. Gradually the literature included in this research extended with additional publications, based on relevant quotes and references I came across in the studied articles.

Figure 2 Step 1 Systematic Literature Review Process

Literature search results
self-directed learning AND entrepreneurship education

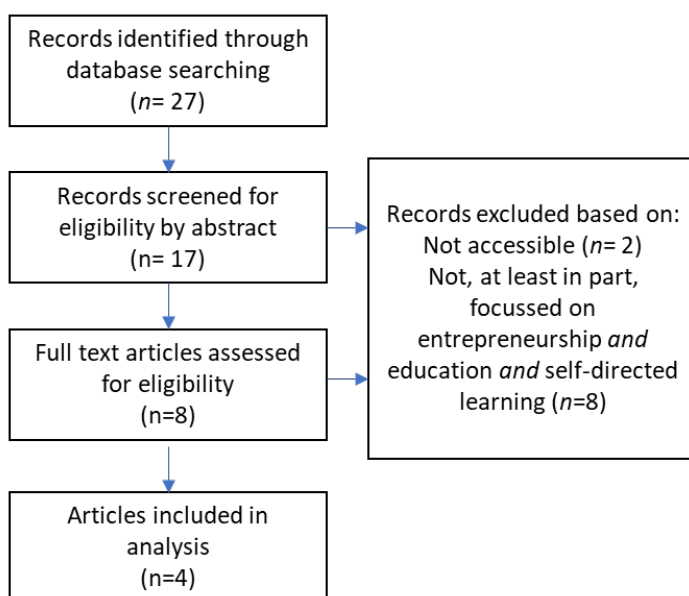
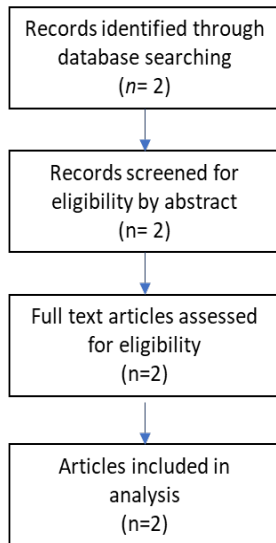
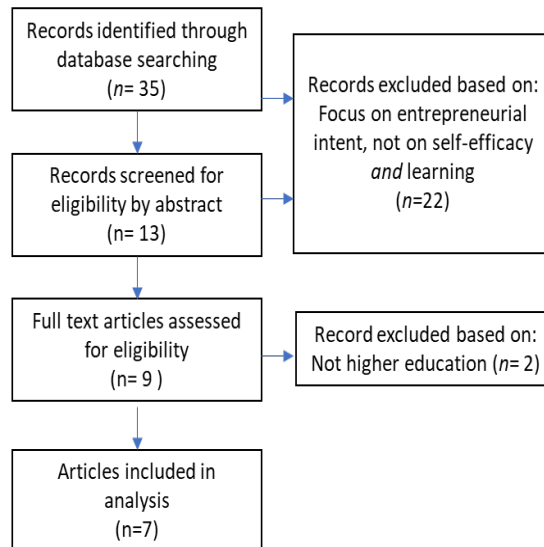


Figure 3 Steps 2-5 Systematic Literature Review Process

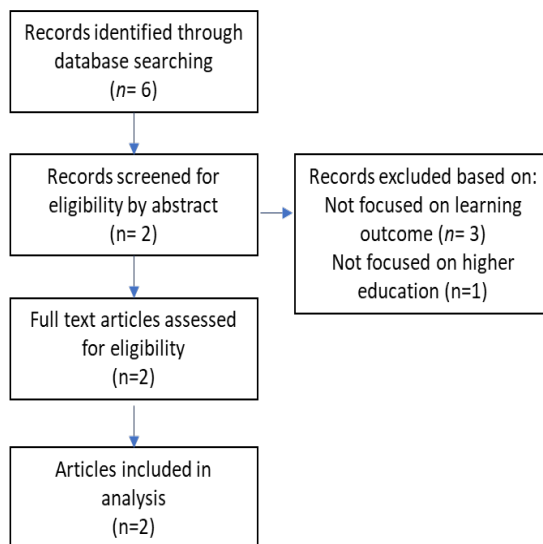
Literature search results
Autonomy AND entrepreneurship education



Literature search results
Self-efficacy AND entrepreneurship education (in title)



Literature search results
motivation AND entrepreneurship education



Literature search results
entrepr* AND edu* AND systematic* AND literature AND review

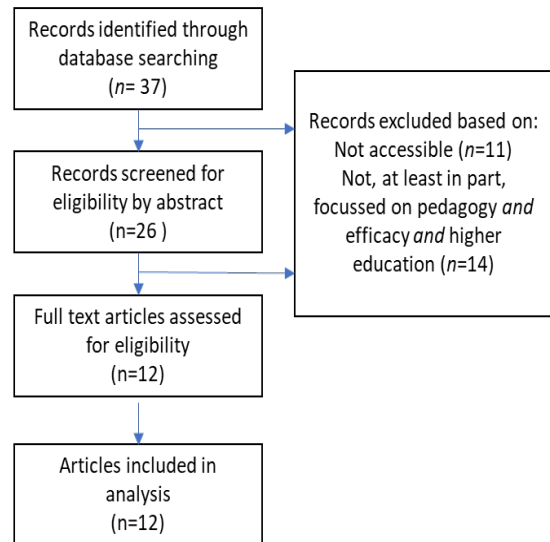


Table 1 Mapping of articles for Key Issues in Entrepreneurship Education

State of the Art & Current Issues in Entrepreneurship Education		
Systematic Literature Reviews related to EE efficacy for competence development		
Author(s)	Year	Key issue
Bechard JP and Gregoire D	2005	Lack of underpinning of EE in education theories
Kuratko DF	2005	Inventory of EE trends, developments and challenges
Pittaway and Cope	2007	Fragmentation of evidence of impact
Solomon G	2007	Recurring survey to evaluate Entrepreneurship Education status quo and developments in the US
Mwasalwiba ES	2010	Diversity of target groups and non-alignment of pedagogical approaches and success indicators
Rideout EC and Gray, DO	2013	Diversity of EE pedagogy and target populations; Weak design of impact studies
Lorz M, Mueller S, and Volery T	2013	Methodological deficiencies in impact studies
Fayolle A, Verzat C and Wapshott R	2016	The choice in EE increases constantly but remains fragmented; Pedagogical objectives and expected outcomes are complex and hard to define without a broad consensus on the nature of entrepreneurship and its associated skills; Available studies are mostly of a descriptive nature, they do not explain whether the teaching methods and approaches are adapted to the various types of learners and expected outcomes.
Nabi G, Liñan F, Fayolle A, Norris K and Walmsley A.	2017	Used the teaching model framework to examine the relationships between pedagogical methods and specific outcomes. They conclude that EE impact research is still predominantly focused on short-term and subjective outcome measures and tends to severely under-describe the actual pedagogies being tested. The paper provides an up-to-date and empirically rooted call for future research on the impact of university-based entrepreneurship education such as the use of novel impact indicators related to emotion and mind-set.
Kamovich U and Foss L	2017	Weak alignment of objective(s), delivery mode (pedagogy) and formation of intentions (impact results): Haphazardness in selection of teaching methods and content.
Hagg G and Gabrielsson J	2019	EE Pedagogy evolution from teacher-directed to student-centred
Heinnovate	2020	Establish a researched informed foundation for an assessment tool and a categorisation model of entrepreneurship courses and programmes

Table 2 Mapping of articles for self-directed learning characteristics

Learner Characteristics		
Autonomy		
Author(s)	Year	Key thought
Gelderen M. van	2011	Autonomy as the Guiding Aim of Entrepreneurship Education
Schwartz B	2004	Tyranny of Choice
Schwartz B	2000	Tyranny of freedom
Taylor K	2006	Autonomy and self-directed learning: A developmental journey
Self-Efficacy		
Author(s)	Year	Key thought
Bandura A	1997	Self-efficacy the effect of experiencing mastery of specific practices that matter to oneself and others.
Bux S and Van Vuuren J	2019	The effect of entrepreneurship education programmes on the development of self-efficacy
Dunlap JC	2005	The effects of students experiencing entrepreneurial failure on their perception of self-efficacy
Eckerle P, Mauer R and Mateias M	2014	Advancing Entrepreneurship Education: Stress Influences on Developing Entrepreneurial Self-Efficacy
Piperopoulos and Dimov	2015	Entrepreneurship education, entrepreneurial self-efficacy
Schunk, D.H.	1995	How education and instruction enhance self-efficacy
Schunk, DH and Pajares, F	2002	How the development of academic self-efficacy and how this relates to achievement motivation
Motivation		
Author(s)	Year	Key thought
Deci EL and Ryan RM	1991	Self-determination, types and sources of motivation
Hytti U, Stenholm P, Heinonen J, Seikkula-Leino JH and Matlay H	2010	Perceived learning outcomes in EE: The impact of student motivation and team behaviour
Pintrich PR	2003	The role of student motivation in learning and teaching contexts
Pintrich PR and Schunk DH	2002	Understanding motivation in education

Table 3 Mapping of articles for Entrepreneurship Education in relation to SDL Framework

Teaching Learning Process for learning-to-learn		
Author(s)	Year	Key thought
Bechard JP and Gregoire, D	2005	Set out to answer the questions i) what are the main educational preoccupations anchoring the research on EE at University level? and ii) why is it that EE has paid little attention to certain dimensions of education research?
Robinson S, Neergaard H, Tanggaard L and Krueger NF	2016	EE pedagogy alignment with educational theory paradigms
Macht SA and Ball S	2016	Aligning learning tasks and objectives with authentic situations
Jones, C	2018	Proposed signature pedagogy to develop entrepreneurial agency
Gabrielsson J, Hagg G, Landstrom H and Politis D	2020	Overview of evolution of EE pedagogy from teacher directed to student centred
Bell R and Bell H	2020	Present an educational framework to support the delivery of experiential entrepreneurship education that is grounded in educational theory
Morris TH and Konig PD	2020	Self-directed experiential learning as key skills to meet the ever-changing entrepreneurship demands

2.1.2 Background & Current state of Entrepreneurship Education

Entrepreneurship as an educational science originated in the USA, where entrepreneurship has historically been a key driver of economic growth (Wilson, 2008). While the first course, consisting of business planning, was already taught in 1947 (Katz, 2003), it wasn't until the early 1970s that the number of courses and institutions teaching entrepreneurship started to grow. The end of the Cold War in 1989 gave way to Federal R&D funding of American universities to facilitate the invention of breakthrough technological inventions. Success of Silicon Valley, and a perceived need to respond to Japan's increasing innovation and economic influence in the US market, led to the enactment of the Bayh-Dole Act to encourage a more active role for universities in technology transfer from, and commercialisation of, research to industry and market (Grimaldi *et al.*, 2011). From then onwards the field of entrepreneurship education began to really take root, initially within the USA (Solomon, Weaver and Fernald, 1994), and gradually across Europe and other continents (Wilson, 2008). By 2018 entrepreneurship courses are taught at most universities across the USA (Kaufmann Foundation, 2019), no longer seen as part of a business curriculum (Logva and Foss, 2018). The dynamics of entrepreneurialism in the USA in comparison to the rest of the world, coupled with the accomplishments of some renowned US universities and their role in the (technological) innovations that have led to unrivalled global entrepreneurial successes may be seen as proof of the policy's effectiveness.

In Europe entrepreneurship was not considered a priority until the 1990s, which is when the availability of venture capital started to grow significantly. The European Commission adjusted its vision on employability from focus on corporates, mergers, and acquisitions towards embracing entrepreneurship and innovation to help spur competitiveness, growth, and job creation, and to achieve the goals set out in the Lisbon Agenda (Wilson, 2008, p.3). The introduction of EE as a substantial part of university curricula in Europe took root in the early years of the 21st century. Since the late 10's of the 21st century the European Commission promotes EE across all levels of education as a means to better prepare its citizens for a work-life that demands adaptability (European Commission 2018b, 2021).

The belief that entrepreneurship, as a set of attitudes, abilities, and skills can be taught, and hence enhance intentions to launch new ventures further fuelled its broad adoption as a field of education. As the field of EE progressed and evolved as a practice and as a scholarship, so did its content and pedagogical approach.

2.1.3 The evolution of pedagogy in entrepreneurship education

The initial learning objectives in EE were geared towards business planning with traditional (behaviouristic) pedagogical approaches of learning about entrepreneurship. Gradually new pedagogies have been introduced to support the development of specific entrepreneurial skills, for which the activities related to business planning fell short. Skill defined as:

“the application of energy and passion towards the creation and implementation of new ideas and creative solutions, the willingness to take calculated risks—in terms of time, equity, or career; the ability to formulate an effective venture team; the creative skill to marshal needed resources; and fundamental skill of building solid business plan; and finally, the vision to recognize opportunity where others see chaos, contradiction, and confusion.” (Kuratko & Hodgetts, 2004, p. 30)

Whilst this definition provided a framework for competence development, it wasn't until 2016 that a common framework for entrepreneurial competence was introduced in Europe. Prior to the European Commission's initiated development of the EntreComp Framework (Bacigalupo *et al*, 2016), there appeared to be little agreement in the field about the competencies or capabilities that are most valuable for aspiring entrepreneurs to learn (Solomon, 2007). Fiet (2001b) for example, identified as many as 116 different topics addressed in syllabi reflective of the beliefs and academic disciplines of 18 Entrepreneurial educators teaching for competencies.

Competency can be defined as an underlying characteristic of a person which results in effective and/or superior performance in a job (Bird, 2002). Teaching for

competencies requires a different approach than teaching for knowledge transfer and which led to the introduction of new pedagogies.

Since 1979 the US National Survey of Entrepreneurship Education (NSEE), initiated by Dr George Solomon as part of his doctoral studies, collects data on pedagogical and theoretical approaches to the teaching of entrepreneurship. The study's systematic evaluation of the extent and breadth of entrepreneurship education (EE) brought insight in the progress made in teaching methodology over the years, with traditional (passive) theoretical pedagogies increasingly being extended with widespread experiential pedagogies and a diversity of applications for practical orientation (Solomon, 2007; Kauffman Foundation 2013).

Until and throughout the 1980s, EE pedagogy was characterised by the 'old-school' behaviourist teaching approach. *"Acceptance [of innovative entrepreneurship educators] by academic colleagues was weak, at best, and many a career was damaged, even destroyed, because the "new academic kid on the block" was not understood or was perceived as a threat to a system of management education"* (Ronstadt, 1987, p.40). As such, (passive), teacher-centred learning methods, consisting of (guest) lectures, readings, and case studies about business content, such as marketing, finance, organisation, and management dominated. Courses were mostly part of MBA programmes, aimed at creating managers capable of leading Fortune 500 companies (Kurakto, 2005), and taught by lecturers with a (scholarly) background in general business management (Hagg & Gabrielsson, 2019). Content focus tended to be subjective to the specific disciplinary background of the teacher, instead of what was considered important in entrepreneurship research (Solomon, 2007). The main objective of entrepreneurship education seemed to be about understanding (elements of) entrepreneurship, which was to be assessed with knowledge reproductive examinations.

Towards the end of the 1980s the learning objective broadened towards the integration of entrepreneurship-related knowledge, expressed in the ability to produce a coherent business plan (Gorman *et al.*, 1997). The teacher-centred, behaviourist approach that characterises this period in EE still treated learners as instruction-dependent, tasked to realise predefined learning goals, by following the course instructions, guidelines, and formats for reproducing and integrating what is learned in the course (Solomon, 2007).

During the 1990s, the aim of EE gradually shifted from its general management focus towards producing entrepreneurial founders, capable of generating real enterprise growth and wealth (Kurakto, 2005; Pittaway & Cope, 2007). Pedagogy was

extended with a more process-oriented, practical approach to match the shift in focus, adopting more action-oriented teaching applications. One such action-oriented teaching approach that EE pioneered with was that of business simulations (Solomon *et al.*, 1994). To remain compliant with academic practice, EE pedagogy remained predominantly concerned with the attainment of knowledge and understanding, yet now in combination with the acquisition of entrepreneurial skills and competences (Robinson, 2016). Even though action-oriented teaching applications facilitate more opportunities for learners to discover and explore personal learning goals, the integration of knowledge in a predefined format for a business plan, even if in combination with a business simulation, remains the most prominent intended learning outcome (ILO).

The increasing involvement of external stakeholders, such as policymakers and business representatives, who pushed entrepreneurship education to build entrepreneurial cultures and stimulate economic growth, fast-tracked the developmental stages of EE. Content, context, and methods used in teaching evolved quickly (Mswalwiba, 2010; Solomon, 2007; Pittaway and Cope, 2007). In the early 2000s entrepreneurship educators pioneered with novel pedagogies to facilitate creative problem solving, such as were commonly found in experiential learning approaches. Pioneering with pedagogy generally brings ambiguity, as learning tasks, goals and objectives may be less clearly defined and therefore more open for students to detect, determine and exploit their personal learning opportunities, in addition to those generally set by the programme developer. Gradually EE has moved away from the behaviourist, teacher-controlled learning approach towards the constructivist, learner-centred approach.

To best mimic entrepreneurial reality, conditions of ambiguity and risk were intentionally created in unstructured and uncertain learning circumstances and environments (Kurakto, 2005). The challenge to educators has been that of crafting innovative, reality-based courses and modules representative of the entrepreneurial climate (Hagg & Gabrielsson, 2019) whilst remaining compliant with the rigours of the academic environment (Robinson *et al.*, 2016), in a field that developed as fast as did entrepreneurship (Solomon, 2007). As the field of EE developed, so did the share of teaching professionals with an actual (either practical or academic research) background in entrepreneurship.

Nowadays students increasingly work on real-life venture projects as the main vehicle of learning (Lackéus 2013, Lackéus and Middleton, 2011, 2015). Establishing student ventures is increasingly promoted as the 'most effective' process of

entrepreneurial learning, applying effectuation (Sarasvathy and Venkataraman, 2011) and the Lean Startup (Jones *et al.*, 2019), using tools broadly applied in the practical field of entrepreneurship, such as the Business Model Canvas or Lean Startup Canvas (Hagg & Gabrielsson, 2019; Neergaard *et al.*, 2020). Students are tasked with learning from taking entrepreneurial action and reflecting upon its process and outcomes.

Table 4 Overview of Pedagogical evolution of Entrepreneurship Education

Time period	1980s: teacher-centered period	1990s: process centred period	2000s: context-centred period	2010s: learner-centred period
Pedagogical development	Traditional (didactic) approach to learning	Centred on the process of learning	Added emphasis on real-world learning opportunities	Constructivist (progressive) approach to learning
Main educational perspective	Instructor and the content to be delivered	Learner and the learning process	Learning environment	Interaction between learner and (broader) society (responsibility)
Educational challenge	Deciding what should be included in entrepreneurship education	Understanding the target of entrepreneurship education	Incorporating hands-on experience in entrepreneurship education	Making assessments and measuring impact of entrepreneurship education

Source: Hagg & Gabrielsson, 2019 p.841

Where the above evolutionary process suggests a linear development of EE, in practice this may not quite be so much the case. The fragmentation of the EE research indicates that a broad variety of pedagogical models is still applied, ranging from the initial behaviourist models to the contextualised venture creation projects.

How the various pedagogies and the categories of pedagogies affect entrepreneurial outcome measures has been the topic of interest for a plethora of impact studies published since the 1990s, with varying and sometimes conflicting results, as will be discussed in the following section.

2.1.4 Issues of concern within entrepreneurship education

Already back in 1984 Sexton and Bowman (in Hagg and Gabrielsson, 2019) voiced their concern over the persistent lack of consensus on some of the very basic issues in this field of study. Robinson and Hayes (1991) expressed concerns over depth of most of the programmes offered, in terms of a solid theoretical basis upon which to build pedagogical models and methods. Possible causes for the lack of depth have been sought in the pioneering approach to the development of entrepreneurship education with a shortage of entrepreneurship faculty at every academic rank and the lack of PhDs in the field of entrepreneurship (Kuratko, 2005), which, Kuratko argued,

was *the result of entrepreneurship being legitimized, but not respected* (p. 587) within the business education domain.

Several scholars (table 1) have generated comprehensive qualitative and quantitative reviews of impact studies to gather and compare evidence for the claimed causal relationship between EE and its objectives (entrepreneurial intent, entrepreneurial action or entrepreneurial competence). These reviews highlight concerns about the adequacy of the research, as they share the opinion that most of the studies that were reviewed lack academic rigour due to deficiency of evaluation methodologies used, weak experimental design, and the variety of contexts in which EE interventions are studied, in terms of pedagogics, course durations and student samples. This is reflected in key studies in the field (Longva and Foss, 2018; Bae *et al.*, 2014; Fayolle and Liñan, 2014; Lorz *et al.*, 2013; Martin *et al.*, 2012).

Longva and Foss (2018) express concern with the quality of the research on EE impact, contending that it “lags the thriving development of EE at educational institutions worldwide” (p.371). Regardless the apparent consensus that entrepreneurship education has a positive impact on entrepreneurial outcome measures, many studies have reported inconsistent or ambiguous findings (Lorz, Mueller and Volery, 2013). This inconsistency in impact reporting leads to confusing and possibly misleading results and interpretations (Rideout and Gray, 2013).

Another issue of concern is that the pioneering approach to pedagogical development of EE has taken on such a myriad of forms that scholars fear it affects generalizability of evaluating processes and the design of impact assessment frameworks (Fayolle *et al.*, 2016; Mwasalwiba, 2010) to the point that the term entrepreneurship education has become ambiguous and imprecise. Scholars call for “*more substantive categorization*” (Piperopoulos and Dimov, 2015 p.973) and proper embedding in educational science (Bechard and Gregoire, 2005).

2.1.5 Embedding EE pedagogy in Educational Science

One of the issues raised in the contemporary EE literature is related to its state of fragmentation and related ambiguity. With so many different courses, targeted at different audiences, serving different purposes, it is difficult if not impossible to generalise about its efficacy for whatever purpose.

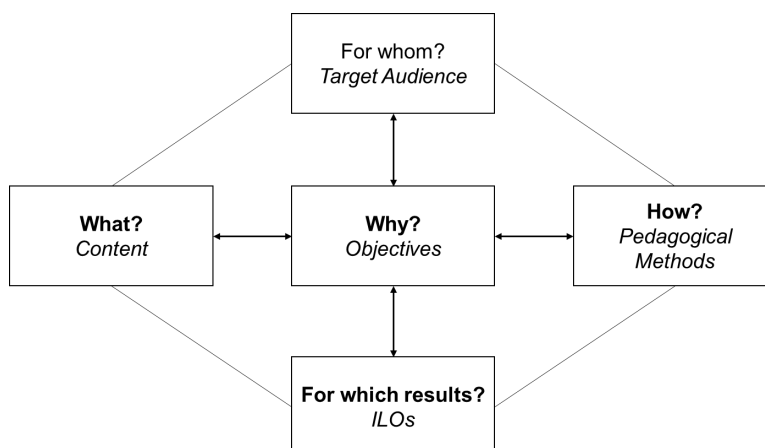
To further professionalise EE, Béchard and Grégoire (2005) emphasised that EE needs stronger embedding in educational science. The authors responded to the observation made by Gorman, Hanlon and King (1997) that *“the majority of entrepreneurship education research is anchored by theoretical references drawn almost exclusively from the management sciences – as opposed to education theories”*, which, they argue, *“should be of primary importance when investigating entrepreneurship education (p.3)*. From the literature review that Béchard and Grégoire (2005) conducted to identify the main educational preoccupations anchoring the EE research at university level, they concluded that:

“most of the entrepreneurship education research proceeds from preoccupations with the content to be taught, with the interface with society, and with the “technologies” of education. By and large, articles proceeding from a content preoccupation refer primarily to the anchoring of entrepreneurship within the disciplines of economics and business administration (management), with an emphasis on the policy and legal contexts relevant to small businesses and economic development” (p.12).

The authors found that little attention is paid to aligning EE with educational theory, which they explained found its roots in i) “the preoccupation of EE researchers with questions of theoretical development and institutional legitimacy, pushing questions related to knowledge transfer and education to secondary place” (p.13) and ii) the divide between EE scholars and EE practitioners. The focus on content, Bechard and Gregoire continue, leaves the question of how to teach unanswered (p.13), for which they propose future research directions.

In answer to Bechard and Gregoire’s (2005) call to start using renowned teaching models in EE, Fayolle and Gailly (2008) introduced an EE teaching-model framework (Figure 3) that would facilitate more specific categorization of modules, courses and EE programmes. The EE teaching model framework consists of a series of critical questions to be addressed; the questions ‘*why*’, ‘*for whom*’, ‘*for which results*’, ‘*what*’ and ‘*how*’ to teach entrepreneurship. The ‘*why*’ question allows for distinguishing between ‘learning for entrepreneurship’ (narrow-view) or ‘learning for becoming entrepreneurial’ (wide-view): the ‘*for whom*’ categorizes courses based on target audiences, the ‘*for which results*’ serves the purpose of categorizing on learning objectives of the course, and the ‘*what*’ and ‘*how*’ questions are asked to determine categories based on content of the module and the teaching approaches.

Figure 4 Teaching Model Framework



Source: Fayolle & Gailly, 2008

The first substantial application of Fayolle and Gailly's framework has been presented in a study by Hägg and Gabrielsson (2019), who have used it to systematically review the empirical literature concerned with entrepreneurship pedagogy over the past 40 years. Based on their comprehensive study and those of several other renowned scholars, the following section explains how EE pedagogy has evolved and what efforts were made to align it with educational theory.

2.1.5.1 Pedagogical Methods in Entrepreneurship Education

Several efforts made to categorize the methods used in entrepreneurship education to facilitate more structural curriculum design and assessment. The initial proposition for categorisation came from Jamieson (1984), who introduced the most frequently used three-category framework which distinguishes between a theoretical approach and a more practical orientation. In this framework EE is classified in terms of 'learning *about* enterprise', 'learning *for* enterprise' and 'learning *in* enterprise'. Within this classification, pedagogical approaches to familiarise students with issues about setting up and running a business are clustered in the category 'learning *about* enterprise'. This category is characterized by its theoretical perspective with learning activities such as lectures, discussions, and case studies. The second category, 'learning *for* enterprise', is more geared towards practical preparation of learners for entrepreneurial careers, teaching and training entrepreneurial skills and competences for starting and running a business. The third category, 'learning *in* enterprise', represents pedagogical approaches with an experiential learning orientation. The target audience for this last category contains mainly business managers and business

owners who aspire innovating or growing their business, using their business and experience as the vehicles for learning (Jamieson, 1984).

Politis (2005) adds the category learning *through* entrepreneurship, or entrepreneurial learning. This category seems to overlap with Jamieson's (1984) learning *'in'* category of teaching entrepreneurship through action-based learning, aimed at gaining experience in entrepreneurship. This approach to entrepreneurship education, "*offering students opportunities to "experience" entrepreneurship management* (Kauffman Foundation, 2014; p.10), found its way into formal education at all levels, targeting full time students who have no frame of reference (Kauffman Foundation, 2014), instead of business owners and managers (Pittaway and Cope, 2007; Robinson *et al.*, 2016).

In its concluding statement, the 2014 NSEE (Kauffman Foundation, 2014) reports a trend in "*providing the opportunity for students to participate in real-life situations and activities outside the program*" (p.36). Yet, whilst the trend is visible, a closer look at the listed 'experiential pedagogies' in the NSEE reveals that the dominant 'experiential learning' preference remains to be for 'in-class' exercises that could be categorized as either learning *about, for, in or through* enterprise (Aadland and Aaboen, 2018).

The dominant pedagogy continues to be that of business plan writing to become familiar with the foundations of business, followed by class discussions to share knowledge, which is in part ascribed to a relatively under-developed pedagogical expertise of entrepreneurship educators in higher education institutions, as a result of the institutional focus on research output and the lack of pedagogical training of PhD students (Bechard and Gregoire, 2005; Bell and Bell, 2020). The more independent, truly experiential learning approaches remained in the bottom third of popular learning methods (Kauffman Foundation, 2014, p.24; Solomon, 2005, p.177).

Truly experiential, outside the classroom, or entrepreneurial learning, characterized as learning that transforms an entrepreneurial experience (eg setting up an entrepreneurial venture) into entrepreneurial knowledge (and behaviour) in terms of increased effectiveness in opportunity recognition and in coping with the liabilities of newness (Politis, 2005) requires a much more self-driving role for the learner (Aadland and Aaboen, 2018; Lackéus 2011; Lackéus and Middleton, 2015), in a radically different approach to learning than the students have experienced thus far (Robinson *et al.*, 2016). This type of "out-of-classroom" experiential learning is currently gaining popularity, with student venture creation programmes gaining foothold in (under)graduate education (Lackéus 2011; Lackéus and Middleton, 2015), as seen in the evolution of EE pedagogy in the previous section.

Ronstadt (1987) proposed to organise EE along a 'two-continuum model' for curriculum design. The first continuum consisting of activities for the development of entrepreneurial knowledge, combining traditional, structured pedagogies (lectures, case studies and feasibility plans) with unstructured practical pedagogies, such as the more practical and experiential activities. The second continuum contains activities to develop entrepreneurial competence, combining 'knowing-how' with 'knowing-who' (to emphasise the importance of connecting and collaborating with people that could facilitate the entrepreneurial process).

The evolution of EE, particularly its continuously experimenting with a broad variety of (new) pedagogies or teaching-learning approaches eventually resulted in a considerable overlap within the existing categorisation, bringing back the question how to categorise pedagogy in EE to facilitate development and assessment of EE activities (Aadland and Aaboen, 2018). Replacing the terms learning *About*, *In*, *For* and *Through*, with '*passive*', '*participative*' and '*self-driving*', Aadland and Aaboen (2018) postulate, allows for structuring EE pedagogy from teacher-centred towards 'student-centred', and from theoretical understanding towards realising 'contextual impact'. Using this contemporary typology enables more specific identification and clarification of learning tasks and activities and facilitates the bundling of teaching-learning activities to match with personal learning requirements, as the categorisation applies to activities instead of the teaching-learning approach as a whole. This method of categorising activities clearly indicates what role and attitude are expected of the student (passive, participative or self-driven), and therefore better facilitates matching teaching style and assessment form. Passive learning corresponds with Jamieson's (1984) and Ronstadt's (1987) theoretically oriented approach and contains pedagogies that require an active, controlling position of the teacher with the learner as receiver of knowledge in the process. The participative learning category contains pedagogies that activate the learner in a contextualised, in-school setting of the learning environment, supervised, and coached by the teacher; and the last category, that of self-driving learning contains the action-oriented, experiential learning approach of learning through practice with the learner in control of the learning process.

Macht and Ball (2016) evaluated and categorised a broad variety of educational and management frameworks to propose a teaching framework to optimise the learning experience in EE. They propose that instruction, learning and assessment should be constructively aligned and reflective of an authentic entrepreneurial situation. Evaluating a broad variety of frameworks, they selected four categories that they suggest are most representative for EE practice. Their proposed authentic alignment

framework integrates student centred -, authenticity-, experiential- and social learning frameworks. The student-centred frameworks represent problem-based learning activities that put students in charge of their own learning. Authenticity is explained as consisting of “*educational activities that are representative of the reality and complexity of situations, which typically occur in real life in the students’ field of study*” (p.929). The authors contend that more EE activities pretend to be more authentic than they really are, which corresponds with the image sketched by the NSEE research. Experiential learning, the authors argue, is what is at the core of EE, however, as with authenticity, experiential seems to be translated differently in EE too, seeing many EE learning activities presented as being experiential, but in truth being more application of theory than experiencing a real or contextualised situation. How the frameworks align with current practice remains unclear though.

Robinson, Neergaard, Tanggaard and Krueger (2016) present a thorough alignment effort, grounding the evolution of EE in educational theory as pedagogy develops from teacher-controlled towards more student-centred. These authors classify EE pedagogical approaches in the educational theories of behaviourism, social learning, situated learning and existential learning. Behaviourism, they confirm to be the prevalent practice in HEIs, because of the belief that “*only what can be measured and observed can serve as the foundation for a scientific study*” (p.4) and often applied to deal with large groups of students and little time to transfer the required foundational knowledge. The argument of dealing with large groups loses its legitimacy though, as higher education is increasingly embracing blended learning technologies (Doolan, 2013).

Social learning emphasises the importance of learning from observing and imitating role models to build self-confidence (Bandura, 1997). The implication for the teacher in EE is that he/she should be both educator and entrepreneur, which, they state, in correspondence with the concern voiced by Bechard and Gregoire (2005), is often not the case. To compensate for this inadequacy of being an entrepreneur role model, teachers rely on guest-speakers and task students with assignments to interview entrepreneurs themselves. Students are also identified as role models to each other in the social learning context. Robinson and colleagues note that self-confidence, or self-efficacy, has become extremely popular in EE, but apparently, we do not understand it sufficiently as they repeat the statement made by Bandura (1997) that “*if education is to incorporate self-efficacy as a learning objective, we need to understand what students perceive as opportunity and especially whether or not they will act upon that opportunity*” (p.6).

Situated learning (Lave and Wenger, 1991) aligns with Macht and Ball's (2016) authentic experiential learning, and is applied in EE to scaffold entrepreneurial competence, allowing the learner to gradually develop from novice to expert, learning from reflection on his/her own actions and by observing those of others. In EE practice situated learning predominantly occurs in internships, which, as the authors proclaim, are often extracurricular and ungraded in science universities and therefore sees only relatively few students put in practice.

Robinson *et al.* (2016) add the theory of existential significant learning, which is related to transformational learning (Mezirow, 2000). They argue that for students to become entrepreneur(ial), they need to reinterpret themselves and therefore go through a radically different learning experience than they are familiar with, one that breaks or intensifies situations in their lives, to restructure their connectivity to the world (p.8). They propose that for students to transform in entrepreneurs, they need to go through these various stages, which aligns with Kolb's (1979) learning style inventory.

Jones (2019) proposes a signature pedagogy for EE to facilitate educators to select the pedagogical approaches to meet the individual students' needs to transform from adjusting to an established curriculum to what Jones refers to as becoming an 'entrepreneurial agent, capable of self-negotiated action'. The signature approach proposed places capacity (to feel, think and act) and habits (of heart, mind, and hands) central as the characteristics to be addressed or transformed in the EE teaching-learning process. How to apply the broad variety of teaching-learning activities applied in EE (Gibb and Price, 2007) remains unaddressed in the paper though, which, considering the challenges posed to EE educators in HEIs to juggle the roles of researcher, educator-cum-entrepreneur (Bechard and Gregoire, 2005), may result in a continuation of current practice.

A recently published study by Bell and Bell (2020) seems to incorporate some of the recommended frameworks presented above. The study proposes a teaching framework for experiential learning in EE, preparing students for what may be considered transformative authentic learning situations. Bell and Bell (2020) acknowledge and emphasise the importance of the objectivist approach, that knowledge can only be used and transferred into other situations when it is understood and thus taught. Their argument, which coincides with that of Macht and Ball (2016), of Robinson *et al.* (2016) and that of general educational practice, is that a foundation of knowledge supports experiential processes and should therefore precede experiential learning activities. In their proposed teaching framework, they divide the learning task in a pre-, a during, and a post-experiential phase and propose specific roles for the

educator and the learner in each phase to facilitate optimal learning. The authors assign an important role to learning *about* entrepreneurship, what Ronstadt (1987) referred to as 'knowing what' and 'knowing how', in a passive (Aadland and Aaboen, 2018), behaviouristic setting to be applied in the pre-experience phase to ensure that learners are cognitively ready for the learning task. The experience phase is characterised by the situated learning approach, which is left open to the educator in terms of how to define 'experiential'. Leaving the experience open for interpretation by the practitioner, the risk is that true transformative and authentic learning remains beyond the scope of the programme as long as EE educators do not create the radically different learning environments required for truly transformative and truly authentic entrepreneurial learning.

In summary, scholars indicate that entrepreneurship education is still a young and dynamic field, both as a practice and as a field of research. Consequentially, it is characterised by fragmentation, which prohibits generalisation of findings. Several efforts have been made to categorize the different pedagogical methods used and to embed these in educational theory. The main issues raised by EE scholars are deducted from this state of fragmentation and the relative youth of the field, stating its lack of academic rigour, the predominantly descriptive nature of analysis and its lack of embeddedness in educational science as issues of concern. Further rigorous research is called for to come to a more fine-grained understanding of the influence of contextual factors in EE. Research, these various scholars suggest, should lead to more robust evidence of the impact of specific pedagogics on certain groups of students. Some of the voids identified in the extant body of knowledge about EE efficacy, and that are relevant for this doctoral research, are that a deeper or more fine-grained understanding is needed about:

- 1) how to teach EE,
- 2) how students experience learning in EE, and
- 3) what learners perceive to be learning opportunities and what it takes to get them to act upon it in relation to building self-efficacy

In response to the concerns raised, a more rigorous research design should be applied than is currently common, including true or quasi-experimental design, and the research should be approached from the perspective of educational theory instead of management theory.

The following sub-chapter explores the SDL literature and the constructionist education literature with the aim to: i) operationalise the construct of autonomous motivation and self-directed learning readiness and ii) to determine how the various

pedagogies applied in EE and the philosophical reasoning behind those pedagogies correlate with self-directed learning theory.

2.2 Educating for Self-Directed Learning Readiness

This section is concerned with understanding what it means to be self-directed learning ready and how this might be developed within a formal (undergraduate) education setting. After a brief introduction of the self-directed learning theory (2.2.1), the chapter presents the results of a review of the self-directed learning literature, the purpose of which is to provide a descriptive analysis of the following questions:

- What characterises a self-directed learner (2.2.2)?
- How can these characteristics of SDLR be enhanced through the teaching-learning process (2.2.3)? and,
- What elements within the social learning environment, within the control of the educator, need to be taken into consideration to facilitate enhancement of SDLR (2.2.4)?

2.2.1 Self-Directed Learning Theory

The groundwork for the extensive body of knowledge on SDL theory was laid by the works of Houle (1961), Tough (1967, 1971, 1979) and Knowles (1975, 1980). Early research on SDL was predominantly descriptive and sought to identify the process by which adult learning occurred. Later work includes model building, goals and ethics of SDL, the nature of SDL and ways of assessing it (Merriam, 2001 p.8).

Terms found in the literature that may represent SDL are 'self-education', 'self-planning', 'autonomous learning', 'independent learning', 'distant learning', 'auto-didacticism', and 'lifelong learning'. Whilst all these terms describe learning as an individual process (as opposed to learning through the actions of others), this study will continue to use the term 'self-directed learning' because of its more frequent association with formal education, whereas the alternate terms are mainly concerned with informal and adult learning. The definition of self-directed learning used in this study is grounded the one provided by Knowles', which is most the frequently quoted definition and apparent premise; that SDL is:

"a process in which individuals take the initiative, with or without the help of others, to diagnose their learning needs, formulate learning goals, identify resources for learning, select and implement learning strategies, and evaluate learning outcomes" (Knowles, 1975, p.18).

Over time, as insight and understanding expanded, scholars have suggested alterations or additions to the dominant definition. Kasworm (1983), for instance, defined SDL as a "*set of generic, finite behaviours; as a belief system reflecting and evolving from a process of self-initiated learning activity; or as an ideal state of the mature self-actualized learner*" (p.1), which places more emphasis on the learner him/herself in addition to the process. Brockett and Hiemstra (1991) took the term beyond the focal scope of the individual and the learning process, arguing that the ability and willingness of the self-directed learner to take responsibility for his/her own learning process is affected by the environment in which the learning takes place (Brockett & Hiemstra, 1991 p.24). As such they assign an important role for educators and the (social) learning context in the process of self-directed learning. Tan and colleagues (2011) define SDL as a 21st century skill to include an "extension of learning", emphasising the importance of "*making links across disciplines, connections between formal and informal learning as well as interests in and out of school*" (p.7), which suggests that self-directed formal learners will extend their learning beyond the scope of the course requirements and materials.

2.2.2 Personal Characteristics & Behavioural Indicators of Self-Directed Learning Readiness

The initial study to determine a learner's "readiness" to engage in a self-directed learning process was conducted by Guglielmino (1977). The study focused on attitudes, abilities, and motivational aspects regarding learning. Findings revealed that highly self-directed learners are "individuals who (1) exhibit initiative, independence and persistence in learning", (2) who view problems as challenges, (3) are curious and self-disciplined, and (4) who combine self-confidence with a strong desire to learn; (5) they are able to manage their time and learning pace and plan their work towards reaching their goal (Guglielmino, 1977). Several leading SDL studies concerned with determining which characteristics make for such independent (autonomous), confident, competent and motivated self-directed learners (table 5) have led to the introduction of models and tools to assess SDL competence or SDL readiness.

Table 5 Critical Studies in self-directed learning literature related to personal learner characteristics

SDL Readiness Characteristics		
Author(s)	Year	Key thought
Guglielmino, L	1977	Identified the main characteristics of self-directed learning readiness and introduced the foundation of evaluating SDLR with the SDLRS
Kasworm C	1983	SDL as a set of generic, finite behaviours that reflect and evolve from a process of SDL activity
Oddi, LF	1987	Oddi Continuing Learning Inventory, presenting personality factors as motivational dispositions
Brockett RG and Hiemstra R	1991	Distinction between the process of SDL (transactional and instructional methods) and the notion of self-direction as a personality construct
Garrison R	1997	SDLR key characteristics: self-management, motivation and self-monitoring
Gibbons M	2002	Observable behaviours indicative of SDLR among university students
Stockdale SL and Brockett RG	2011	Personal Responsibility Orientation to Self Direction in Learning Scale
Hiemstra R and Brockett RG	2012	Revisiting the PRO model: Personal characteristics, Process and Context as foundation for enhancing SDL. Foundation of the theoretical framework

Coherence is found across studies, in that self-directed learners are found to be task oriented, set clear goals for themselves, seek to discover new approaches, can work autonomously and are capable of self-planning and self-managing and monitoring their learning process in line with their goals, to complete the work (Oddi, 1986, 1987; Brockett and Hiemstra, 1991; Grow, 1991; Garrison, 1997; Stockdale, 2003; Stockdale and Brockett, 2011). They learn to cope with ambiguity (Stockdale & Brockett, 2011), to motivate, activate and regulate themselves, to search for and evaluate new approaches and to work autonomously (Guglielmino, 1997; Long & Agyekum, 1983; Oddi, 1986; Brockett & Hiemstra, 1991; Garrison, 1997). Learners become active participants and deep learners in the learning process (Spencer & Jordan, 1999), which benefits higher level thinking skills such as creativity, problem solution and critical thinking as well as academic success and development (Telkkol & Demirel, 2018). Contemporary SDL literature adds skills such as critical reflection (Hiemstra and Brockett, 2012), critical thinking and digital literacies (Bouchard, 2009). These latter skills are essential to cope with the rapidly growing volume of digitally available information and non-information, and the increased demand for participation in online learning activities. The sudden shift from in-school to out-of-school online learning, such as was forced upon all students during the SARS-Cov-2 pandemic of 2020-2021 and is expected to remain for a large part in the shift towards blended learning, has emphasised the need for increased SDL skills.

The tools used to evaluate SDLR are predominantly Likert scale self-assessment questionnaires, which may be prone to bias and subjective interpretation. To gain a more holistic understanding of SDLR, Maurice Gibbons (2002) conducted an observational study in which he studied the learning behaviour of (under)graduate students to identify behavioural indicators that would reflect SDLR. The study identified 'taking ownership over the learning task', 'identification of and commitment to learning goals', 'using one's own judgement instead of asking for instruction' (trying before asking), 'proactive participation in learning activities', 'eagerness to learn within and beyond the school's curriculum' and 'eagerness to express oneself in discussions' as behaviours that can be classified as characteristic for enhanced levels of self-direction. Gibbons places these behaviours in a spectrum of SDL readiness, much like the iterative approach to developing self-directedness and learner autonomy promoted by Candy (1991) and Kasworm (1992). The scholars explain that students may enter a learning challenge at different levels of SDLR, depending on the challenge and specific background of the learner. According to the mixed- or spectrum approach, learners progress along a continuum, from the lowest level of incidental self-directed learning towards gradual development of the highest level of self-directed learning readiness. Each stage of the spectrum prescribes a specific role for the teacher, matching with the student's level of autonomy, self-efficacy or confidence and motivation to self-manage the learning process. How this affects the teaching/learning transaction will be discussed in chapter 2.2.3.

Synthesising the literature, a self-directed learner can initiate, plan, monitor and manage an individual learning process. Personal characteristics identified as foundational to be able to self-direct such an individual learning process may be grouped in the constructs of learner autonomy, self-confidence or self-efficacy and motivation. To understand how these constructs may be operationalised into (behavioural) indicators, that may be used for the evaluation of the potential efficacy of entrepreneurship education in this regard, the literature review was broadened with publications that specifically discuss autonomy, self-efficacy and motivation in relation to education, to self-directed learning and to entrepreneurship (education).

2.2.2.1 Autonomy and Self-directed Learning

Autonomy refers to self-regulation, or the desire to be self-directed (Pink, 2009). In educational settings autonomy is explained as the extent to which students have and make choices about what to study and how and when to do it. As such there may always be friction between the educator and the student's expectations. In what the educational literature refers to as 'unidimensional classrooms' (Schunk, 2009; Biggs, 2003),

students are generally confronted with undifferentiated task structures, leaving them with limited choice, which may stifle their motivation when they feel being controlled instead of in control. Motivation theory in education distinguishes in this regard between performance-oriented and mastery-oriented students though (Kischner and Hendrick, 2020). Where mastery-oriented students seek freedom to pursue their own subjective standards for success, progress and understanding, performance-oriented students seek normative standards such as grades and class ranking. Performance-oriented students may do their coursework because it earns them rewards such as a degree, for which they may confine their learning activities to finding out and producing what the teacher expects. In such a passive mode, these students are not strengthened in their ability to be autonomous (Van Gelderen, 2011). Performance oriented students thrive in teacher-controlled learning situations in which they gain confidence, knowing what is expected of them and being able to compare themselves with peers. Behaviours characteristic for this type of learner include asking for specific instruction and assessment criteria or rubrics, criticising and improving the work of others in collaborative assignments to meet own standard against the assessment criteria (approach) and/or avoidance of risky and ambiguous learning activities (Kischner and Hendrick, 2020; Pintrich, 2003).

Where it comes to learner autonomy for self-directed learning, Candy (1991) introduced '*the dual nature of learner autonomy*', making a distinction between self-determination (the personal disposition, or motivation-intention relationship to pursue learning) and self-management (the ability to exert control over one's learning process). Both dimensions of autonomy are essential for self-directed learning to occur (Candy, 1991, p.101). The dimension of self-determination, also referred to as the conative dimension, contains constructs of initiative, resourcefulness and, persistence in overcoming obstacles as the salient characteristic manifestations of learner autonomy. The dimension of self-management is operationalised in behaviours of goal-directedness, action-orientation, self-startedness, taking an active approach to problem solving, self-control and self-regulation as the dominant indicators of learner autonomy. *Goal-directedness* is expressed in learners establishing specific, challenging personal learning goals, breaking them down into proximal subgoals and working towards accomplishing them. *Action-orientation* is described as the rapidity with which the student's learning intention is transformed into a plan for and execution of a learning activity (Ponton and Carr 2000, p.275). The explanation of self-startedness resembles the SDL process, being considered the expression of intrinsic motivation of students to

initiate, self-plan, self-manage and execute an independent learning activity, persisting to achieve the personal goals set.

Feeding forward from this review to construct the conceptual framework and develop the research framework for collecting and analysing the primary data, the construct of autonomy can be operationalised with the definition and behavioural indicators as illustrated below, in table 6:

Table 6 Operationalisation of the construct Autonomy

Autonomy	
Synonym	Self-Regulation, Self-Control
Definition	The extent to which students have and make choices about what to study and how and when to do it. The desire to be self-directed
Indicators	Initiative - Self-Starting Taking control Resourcefulness Persistence Independent Goal directedness Task- and Action orientation
Sources	Self-confidence Motivation Interest

2.2.2.2 Self-efficacy and Self-directed Learning

The role of self-efficacy in learning is well substantiated (Schunk, 2009, p.126) and strongly connected to motivation (Deci & Ryan, 2002; Atkinson, 1957; Bandura, 1977a, 1977b, 1991, 1997), effort and task-persistence (Bandura and Cervone, 1986; Schunk, 1995) as well as cognitive engagement in learning (Bandura, 1993) depending on perception of difficulty (Salomon, 1984). The construct has been particularly well studied by Dale Schunk and Albert Bandura, both of whom have published a multitude of studies, many of which in the context of learning and personal development.

Bandura defines self-efficacy as:

“the belief a person has about what he/she is capable of doing, or a person’s judgements of his/her capabilities to organize and execute courses of action required to attain designated types of performances” (1986, p.391).

Schunk correlates the degree of self-efficacy held by a person to his/her choice of activities, effort and persistence; stating that:

“high(er) levels expressed in enhanced [learner] willingness to work hard, persevere when things don’t go as planned, deal with ambiguity and setbacks and pursue challenging goals, and low(er) levels of self-efficacy on the other hand have been connected with task avoidance” (1991, p.208).

Self-efficacy theory postulates that the construct is situation-specific, meaning that a person may have high self-efficacy in one situation or context, yet low self efficacy in another. As Schunk (2009) explains:

“one’s self-efficacy for a specific task on a given day might fluctuate due to the individual’s preparation, physical condition and affective mood, as well as external conditions such as the nature of the task (length, difficulty) and social (e.g. classroom) environment” (p.108).

The Self Efficacy theory (Bandura, 1977) explains that people acquire information from four sources to appraise their self-efficacy: their own performance accomplishments or enactive mastery; vicarious (observational) experiences from (role) models such as teachers, peers and relevant others; forms of (verbal or written) persuasion; and physiological indexes or arousal indicative of emotional experience (e.g. increased heartrate, sweating, trembling in low self-efficacious situations).

Enactive mastery is experienced when learners experience making progress on tasks and goals. It is therefore strongly correlated with goal setting, achievement visibility (performance exposure), perceived level of autonomy (self-instructed performance), performance in comparison with that of others (participant-modeling), receiving (constructive) feedback and appraisal. Vicareous experience refers to comparing oneself to others. Exposing students to adult models has long been acknowledged to enhance self-efficacy for learning and performing well. Observing ‘similar peers’ perform the required task, however, was found to increase students’ self efficacy for learning even stronger. Similarity in this sense means matching with individual (and therefore different) levels of expected performance mastery (Schunk, 2009). The closer the observed (role)model is to the learner, the more influence he/she will have on his/her efficacy perception, especially when the learner is exposed to not only a mastery model, but also to several coping models (how to solve the issue/problems encountered). It becomes obvious that the teaching-learning process and the context in which the learning takes place are of significant influence on learners’ perceived self-efficacy, assigning an important role to teachers, teaching material and peer-learners in the learning process, and would therefore benefit from embedding in social constructivist learning theories.

The indicators that may be used to reflect mastery levels of self-efficacy and its sources of enhancement to be included in the conceptual and research frameworks can be summarised as indicated below in table 7.

Table 7 Operationalisation of the construct Self-Efficacy

Self-Efficacy	
Synonym	self-confidence
Definition	A person's judgements of his/her capabilities to organize and execute courses of action required to attain designated types of performances
Indicators	Willingness to work hard (<i>Effort</i>) Persevere (<i>persistence</i>) when things don't go as planned Deal with ambiguity and setbacks (<i>persistence</i>) Pursuit of (<i>approaching vs avoiding</i>) challenging goals Thinking and Decision making (independently)
Sources	Enactive mastery Vicarious (observational) experiences from (role) models Verbal persuasion Psychological indexes / emotional arousal

2.2.2.3 Motivation and self-directed learning

The third construct in personal characteristics and behaviours is motivation for (self-directed or self-regulated) learning. Motivation is defined as 'the process of instigating and sustaining goal directed behaviour' (Schunk, 2009 p.453). The construct of motivation is used to explain why people behave the way they do and operationalised with behavioural indicators such as '*proactive, engaged, activation, self-regulation, autonomy, interest, enjoyment, satisfaction and intention*' (Ryan and Deci, 2000; Pintrich, 2004; Reeve, Deci & Ryan, 2004; Weiner, 1985). People whose motivation is authentic, that is, self-authored or endorsed, are found to exhibit higher levels of interest, excitement, and confidence to undertake a (learning) challenge. They would therefore also be more likely to initiate a self-directed learning activity (Garrison, 1997; Ryan and Deci, 2000). Levels of motivation are strongly linked to the constructs previously discussed; the perceived level (or locus) of control (internal vs external regulation), self-efficacy or confidence in perceived competence, as well as expected or experienced level of support. In Ryan and Deci's Self-Determination Continuum (1991) they postulate six types (or levels) of motivation, ranging from amotivation (unwillingness), through four levels of extrinsic motivation, to intrinsic motivation, expressed in active personal commitment.

Between amotivation and intrinsic motivation, four types or levels of behaviour regulation in extrinsic motivation are proposed. The extrinsically motivated levels of behaviour regulation, labelled as *external regulation*, *introjected regulation*, *identified regulation* and *integrated regulation*, differ in the degree of autonomy experienced in the contextual factors (Ryan and Deci, 2000 p.72). Autonomy supporting contextual factors are seen to stimulate self-regulated behaviour towards internalisation of learning goals and hence deeper learning, whereas in the more controlled contexts behaviours tend to be performed because “*they are believed to be instrumental to some consequence*” (Deci *et al.*, 1991 p.328). Learners in higher education may be categorized in two types of motivated learners: performance-based learners and interest-based learners. Performance based learners tend to focus on obtaining results (eg credits / grades) and thus seem to fit with the extrinsic motivation categories, whereas interest-based learners are described as intrinsically motivated to engage in learning activities. Interest is reflected as a well-developed personal preference to enjoy and value a particular subject or activity across situations (Harackiewicz *et al*, 2016; Krapp, 1999). Performance-based learners on the other hand tend to ask for clear and specific instruction to ensure they can optimize their performance in module assessments (Schunk, 1999; 2009).

Pintrich and Schunk (2002) modelled a generic process of motivated learning (Figure 5), depicting motivation arising largely from thoughts and beliefs, during three phases in the learning process: pre-task, during task and post-task (Schunk, 2009).

Figure 5 Process of Motivated Learning

Pre Task	During Task	Post Task
Goals	Instructional Variables	Attributions
Expectations	Teacher	Goals
Self-Efficacy	Feedback	Expectations
Outcome	Materials	Affects
Values	Equipment	Values
Affects	Contextual variables	Needs
Needs	Peers & Environment	Social support
Social Support	Personal variables	
	Knowledge construction	
	Skill acquisition	
	Self-regulation	
	Choice of activities	
	Effort & Persistence	

Source: Schunk (2009, p.454)

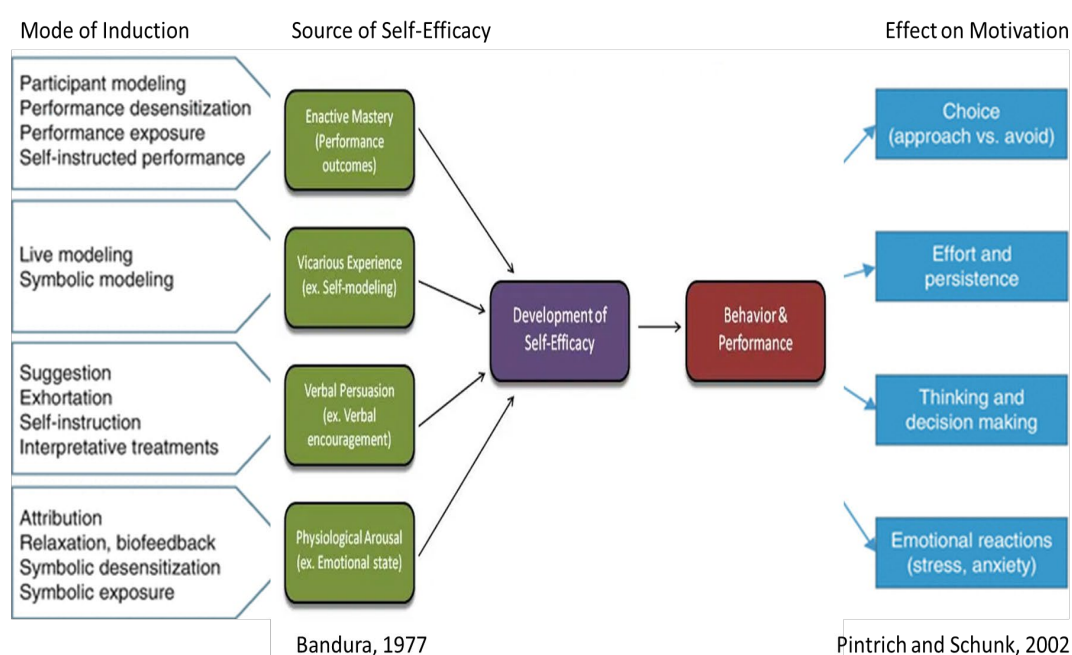
Their proposed process model aids understanding of how educators may influence interest in the content to be studied in the various phases of the module's activities. The benefit of sparking situational and personal interest is that enhanced interest leads to enhanced levels of self-regulation, task engagement, and persistence (Sansone and Toman, 2005), and thus enhances (situational) self-directed learning readiness.

In the pre-task phase, students enter a module or task with personal goals and expectations that affect their motivation to participate in the learning activity (task), which correlates with their level of autonomy and self-efficacy for the task at hand. What goals the students set for themselves differs. Some students enter a learning task with specific achievement goals, others with social goals, and others again with performance goals. Where some will set ambitious goals for themselves, others simply aim to pass; where some strive for top grades, others might aim to optimize the experience. How students enter the learning task also depends on the value they give to the task for their personal development and experience. In the book *Freedom to Learn*, Rogers & Frieburg (1994) emphasise that learning tasks perceived as relevant, meaningful, and therefore valuable by students, sees students more involved as a whole (both cognitively and emotionally), set challenging goals for themselves and initiate activities both inside and out of school to achieve those goals, evaluate their performance and put in significant effort and persistence to achieve their (learning) goals. The expectancy-value theory of achievement motivation (Atkinson, 1957) relates the level of achievement behaviour not only to the perceived value of the learning task but adds the expected performance to how tasks are approached. Students, the expectancy/value theory postulates, either hope for or expect success, and thus approach an achievement-related goal. Or they fear failure, and thus avoid pursuing such goals or partake such tasks. This supports the advocated strong tie between motivation and self-efficacy (Eccles, 2005; Eccles & Wigfield, 2002; Elliot & Church, 1997; Weiner, 1992; Atkinson, 1957) (Figure 6).

Affects refers to emotional experience of the learner, which may vary from excited to anxious or no feeling whatsoever (Pintrich & Schunk, 2002 p.454). The model depicts that during tasks, motivation is influenced by instructional and context variables (which will be discussed in the next sections) as well as personal variables associated with (self-directed) learning, such as their perceived competence level (self-efficacy) and task readiness (e.g. level of autonomy required for the task). Students' motivation for continued learning, Pintrich and Schunk (2002) postulate, correlates strongly with

students' perceptions of how well they are learning within the teaching-learning environment.

Figure 6 Sources and Effects of Self-Efficacy on Motivation



This figure is based on the works by Bandura (1977), Eccles (2005), Eccles & Wigfield (2002) and Pintrich and Schunk (2002)

The 'Post-task' phase is likely the most interesting phase for this doctoral study, since this is where self-directed learning is expressed in the learner's ability and willingness to gain additional knowledge and skill, beyond the requirements for the task or course. The variables mentioned in this phase equal those that determine motivation in the pre-task phase (Figure 5), which may be influenced during the task phase, with student either gaining or losing motivation for the task/course.

The behavioural indicators of motivation and elements that influence motivation to be evaluated in the primary research phase may be summarised in table 8.

Table 8 Operationalisation of the construct Motivation

Motivation	
Definition	The process of instigating and sustaining goal-directed behaviour; an explanatory concept that helps us understand why people behave as they do
Indicators	Pro-activeness Engaged in task Self-Activation Self-Regulation Autonomy Interest, Excitement Enjoyment - Enthusiastic Approaching vs avoiding achievement-oriented goals Search & evaluate new approaches (Resourcefulness)
Sources	Goals Expectations Attributions Values Affects Needs Perception of control Social Support
Influential variables	Instructional variables Contextual variables Personal variables

Motivation may be considered the key construct in personal characteristics that determine students' attitude towards lifelong learning and seems strongly correlated to their perceived level of autonomy (control) and self-efficacy. From this review the hypothesis is derived that perceived levels of autonomy and self-efficacy are predictive for students' motivation for learning (H1).

2.2.2.4 Concluding the construct of self-directed learning readiness

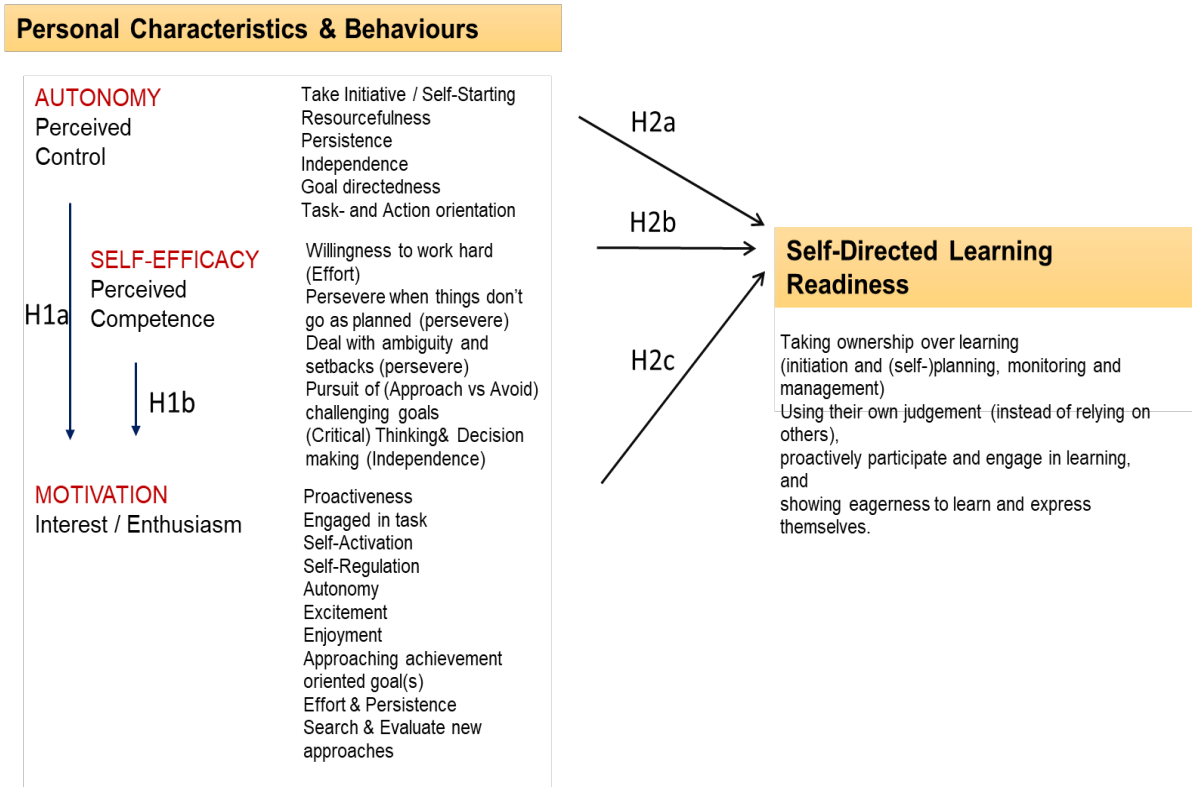
The review of the SDL literature with the aim of operationalising the construct Self-Directed Learning Readiness revealed that learners who are ready for self-directed learning (SDLR) take ownership over their own learning, by means of initiation and (self-)planning, monitoring, and management, using their own judgement instead of relying on others, proactively participate and engage in learning and show eagerness to learn and express themselves. Readiness to initiate, plan, monitor and manage an individual learning process, requires students to feel capable of organising and executing the courses of action needed to realise their learning goals (self-efficacious), and feel free to make choices about what and how they wish to learn (autonomy). Because a self-directed learning process is self-initiated and self-regulated, motivation is considered to derive from within the learner. The willingness to approach achievement-oriented goals, and persistence and perseverance with challenging tasks is correlated with intrinsic, or at least internalised (because considered either useful or valuable for the learner) motivation. The hypothesis that derives from this review is that learner autonomy, self-efficacy and motivation are predictive for self-directed learning readiness (H2).

From the review the argument may be drawn that the proposed relationship between the constructs of motivation, autonomy and self-efficacy is influenced by instructional and contextual variables, which calls for a deeper understanding of how to organise teaching-learning practices that support their enhancement.

Motivational theory revealed that students' willingness to be autonomous requires a perception of situated competence, which, the theory continues to explain, is influenced by teaching-learning environment through elements like positive or negative reinforcement, modelling and (vicarious) experience.

To prepare for the evaluation of the potential efficacy of pedagogies applied in entrepreneurship education for enhancing these constructs, the following section of this chapter reviews the educational literature and the self-directed learning literature to identify (best) practices that enhance these self-directed learning readiness skills through the teaching-learning process.

Figure 7 Initial Conceptual framework for understanding self-directed learning readiness



2.2.3 Teaching for Self-Directed Learning Readiness

The initial learning process models for SDL, as proposed by Tough (1971, 1979) and Knowles (1975), were predominantly linear and individual. According to the initial SDL process model the learner goes through specific 'stages', that start with the self-diagnosis of a learning need that arises from a situation in everyday life and then follows through various stages of (self-)monitoring, planning and (self-) management. The stages presented in this process model (Figure 8) have been frequently applied in SDL studies in the 1970s and 1980s and resulted in an abundance of "how to" methods (Bouchard, 2011).

Figure 8 Stages in an SDL Process

Stages in the SDL process:

- 1- decision on a learning goal
2. determination of a learning sequence and a learning schedule
- 3- securing the physical and financial resources to pursue the learning project
- 4- selecting a suitable place to learn
- 5- selection of resources and materials needed to learn
- 6- connecting with appropriate resource persons
- 7- resolving motivation issues
- 8- overcoming learning difficulties
- 9- minimizing self-doubt
- 10-setting subsequent learning goals at the end of the learning sequence

Overall, the SDL theory agrees that it is in the confrontation with a situation in which an individual experiences a gap in knowledge or competence which the (self-directed) learner senses as being so urgent to close that (s)he initiates, executes, and fulfils a learning challenge. In the initial process models, there is no involvement of an educator. Instead, the SDL process is presented as being individual and independent, profiling the learner as autonomously motivated, because autonomous, self-efficacious and intrinsically motivated. That learners are profiled as self-directed learning ready may be rooted in the origin of the SDL theory, in research about how adults learn, after having completed formal education. The adult learner is assumed to be competent and ready to initiate, manage and successfully complete a learning challenge independently. Adults are postulated to discover their learning needs in confrontation with relevant (work-related) situations in (real-world) settings in which newly acquired knowledge or skill may enhance performance and thus bring reward (Vroom, 1964),

achievement and affiliation, and/or power (McClelland, 1987). For young adults in formal (undergraduate), teacher-centric educational settings this is usually not the case. Within formal (full-time) education, exceptions are found in vocational, experiential, practice-based learning programmes, which, as SDL as a field of research evolved, have attracted much attention of SDL scholars to determine how to foster SDLR among (young adult) students. Most of the SDL literature related to (under)graduate education therefore originates in medical and engineering programmes and resulted in the proposition of more interactive, holistic process theories and models that include a significant role for organised (formal) instruction (table 9 below).

Table 9 Key studies concerned with Teaching-Learning Process for Self-directed Learning

Author	Year	Description
Linear, autonomous learning process		
Tough A.	1967	Adult learning without a teacher
Knowles M.S.	1975	Pragmatic, Informal learning. Driven by life-centred problems
Interactive learning process		
Spear G.E. & Mocker D.W.	1984	The environmental circumstances surrounding the learner provides the structure in which learning occurs. Learning is not planned, but structured by the learner's environment - Organizing circumstance
Candy P.C.	1991	The ability to be self-directed is specific to a given body of knowledge and placed within a specific context
Danis C.	1992	Transformative learning in reaction to a triggering life event
Instructional Process		
Mezirow J.	1985	Transformational Learning: using a prior interpretation to construe a new or a revised interpretation of the meaning of one's experience in order to guide future action
Brookfields S.D.	1990	
	1986	
Grow G.O.	1991	Staged Self-Directed Learning Model to describe a process for helping learners negotiate aspects of the SDL process
Garrison R.	1997	Distinction between external control (by means of control over teaching) and internal cognitive responsibility (as the ability and willingness to initiate and complete a learning process)
Hase S. & Kenyon C.	2000	Learning how to Learn (Heutagogy) in distant and online learning environments

As the SDL literature evolved, the idea that learning is completely independent gained opposition. Spear and Mocker (1982, 1984) were among the first to propose the active involvement of educators, stating that elaborate preplanning of a self-directed learning activity requires a prerequisite level of skills for independent study and the willingness to use them, as well as familiarity with educational or instructional design and planning models. Most of these skills were found to be underrepresented in their research sample of 78 adults, suggesting that the involvement of educators or instructors not only benefits learners in formal education, but equally those in (work related) learning processes beyond the scope of formal education. Brookfield (1985)

goes beyond the involvement of the educator alone, postulating that successful self-directed learners place their learning within a (broader) social context. In his research peers and teachers are cited as being important learning resources, models, and soundboards for learners. This view is broadly acknowledged in later work of SDL scholars (including Grow, 1991; Garrison, 1997; Brockett and Hiemstra, 1991, 2012; Piskurich, 1993; Pilling-Cormick, 1997; Hiemstra, 2009; Boyer *et al*, 2014). The contemporary shift from physical to digital learning environments has even strengthened the need for relatedness to knowledgeable others (Kop and Fournier, 2010; Kop, 2011; Conradie, 2014). All these scholars give prominence to involvement of educators in cultivating learning confidence and competence to facilitate self-directness in a learning process.

When analysing the SDL process, several critical roles can be identified for the educator. In the first phases of the SDL process, the diagnostic phase, when learners identify a developmental need and decide on the learning goal(s), learners need to be given sufficient critical awareness of [contextual or situational] meaning. In other words, what is to be known and what it means to be competent in the learning situation needs to be framed or contextualised. The learner then requires sufficient self-knowledge or some guidance to become conscious of an incompetence or knowledge-gap within that contextualised framework. To be able to autonomously plan and manage learning activities, learners need familiarity with planning models and tools and methods to evaluate their progress, which requires feedback and sometimes hints from the educator to keep the learner on track. The ability to evaluate learning outcomes requires a relevant 'cognitive framework for understanding', without which the learner struggles to understand how knowledge gained (inside the classroom) can be applied in real life situations (Kop and Fournier, 2011; Guglielmino, 2013; Hiemstra, 2013; Merriam and Caffarella, 1991, 1999; Grow, 1991; Hammond & Collins, 1990; Mocker and Spear, 1982). For education practitioners this means giving meaning to abstract knowledge and value to competence by creating situations in which what is learned is applied in real-world settings.

The educational literature argues that *effective development* [of competences] *requires a hierarchical approach to learning* [in which] *educators should position the target skill* [or competence] *at the top of the hierarchy and gradually identify prerequisite skills, continuing down the hierarchy until one arrives at the skills the learner(s) can perform now*" (Dick & Carey, 1985; Merrill, 1987 in Schunk, 2009, p.287). This may explain why fully experiential education, in which learners are 'thrown in the deep', expected to apply knowledge and skill prior to having learned [*about*] it (so without the

cognitive framework or prerequisite skillset for it), occasionally leads to decrease of students' perceived competence (Oosterbeek, Van Praag and IJsselstein, 2010) and demotivation for a course or task (Kasworm and Yao, 1992).

An SDL enhancing teaching-learning process should therefore be organised:

- 1) in a *contextualised*, authentic, situational setting, so that personal learning needs can derive from experiencing a competence gap that is interesting, challenging yet achievable to close, and contributes to the learner's perceived performance or achievement,
- 2) to scaffold knowledge and competence development with a *hierarchical approach*, in which students can commence their learning process at their own level and pace.

2.2.3.1 Contextualising teaching and learning to enhance SDLR

Proponents of contextualised learning argue that true learning occurs:

'when the learner is confronted with an authentic situation in which the actual cognitive processes are required, rather than in situations of simulated activity typical of school'

(Lave and Wenger, 1991 as quoted in Merriam, 2003 p.209).

Nonetheless, as discussed in the previous section and in the background of this study, the dominant practice in (higher) education tends to still be that of behaviourism or at best simulating contextual settings. So long as students are treated as a homogeneous group, with equal cognitive frameworks and skillsets, mostly as 'blank slates' regarding the subject studied, curricula tend to remain unidirectional, de-contextualized and de-subjectivized (Robinson *et al.*, 2016; De La Harpe and Radloff, 2010), leaving little to no room for learners to discover learning needs themselves. With the role of (professional) education in need of changing from cognitively preparing for a particular profession to preparing people to be adaptive to various settings they may encounter over the course of their working lives, education needs to embrace new, more existential, transformative formats of learning (Mezirow, 2000; Robinson *et al.*, 2016). Constructivist forms of schooling have been called for since the 1970s, yet regardless its need being broadly recognised, organising such new forms of schooling is obviously difficult, considering the continuing debate about the efficacy of education to prepare for the world-of-work (Chamorro-Premuzic and Frankiewicz, 2019; Mulcahy, 2019; OECD, 2020).

An abundant body of (educational) knowledge is available regarding contextualised learning. The construct has been conceptualised in a variety of social constructivist learning theories (table 11), some of which were discussed in the previous section, including discovery learning (Bruner, 1961, 2009), experiential learning (Dewey, 1938), situated learning (Lave and Wenger, 1991), Rogoff's (1994) communities of learning, and more recently in entrepreneurial learning (Politis, 2005). All these learning theories argue that deep learning is a social constructive process that requires interaction between people, sharing an experience within an authentic (real-world) setting or situation, in which they are confronted with specific requirements. Deep learning in this sense may be defined as learning-to-learn and therefore related to the concept of self-directed lifelong learning readiness (SDLLR).

In the SDL literature contextual learning is conceptualised as the purposeful organisation of circumstances within the learning context (Spear and Mocker, 1984) that provide an attractive yet challenging new situation to students, that triggers recognition of a development need and a desire or sense of urgency to fulfil the learning requirements (Moore, 1980; Brookfield, 1985; Gibbons, 2002). Organising such circumstances or contextualising teaching and learning entails relating subject matter content to real-world situations, motivating students to make connections between knowledge and its application to such authentic situations (Candy, 1991; Danis, 1992). Authentic situations in contextualised educational practices stimulate active participation in problem solving and critical thinking regarding a learning activity when students find the activity relevant and engaging (Briner 1999), and for which they feel cognitively and conatively 'ready'. Not only do students become aware of a learning need. The contextualised learning environment also makes them more critically aware of their already mastered knowledge and competence. This recognition of competence or task-readiness in turn affects their self-confidence (or self-efficacy) and autonomous motivation for self-regulated learning (Bandura, 1997; Brookfields, 1990; Garrison, 1997).

Contextualising the teaching-learning process "in-school" means "bridging" between theoretical (passive, classroom) learning and the actual practice of work by organising simulated work environments and specially designed social interactions. Practices proposed by the various constructivist learning theories include the use of models (peers and representatives from the real-world practice), case-based teaching-learning, project- and problem-based learning, (business plan) competitions and more recently value- and/or venture creation programmes.

Table 10 Comparison between traditional and contextualised learning

Traditional Education		Contextualised Learning	
Teaching Practices	Teaching implications	Teaching Practices	Teaching implications
Treats students as homogeneous group	Standardised study design	Recognises and appreciates differences between students	Customised study design
unidirectional curricula	Repeatable course organisation	omnidirectional curricula	Situation specific course organisation
Development of general skills	General learning goals	Confrontation with situation specific skill requirement	Personalised learning goals
Focus on individual performance	Summative assessment	Socially shared performance	Formative feedback
Cultivates symbolic thinking	Linear skill development framework	Thinking in genuine situations	Hierarchical skill development framework
Theoretical / hypothetical learning	Use of predefined learning resources	Practical real-world learning	Anticipation and reaction to actual situation main resource for learning

Because a learner's willingness to act is influenced by his/her perceived competence with respect to that area of activity, fears and insecurities, education literature argues, must be overcome to realise students' involvement in collaborative, contextualised learning experiences (Eccles, 2005; Pintrich and Schunk, 2002; Elliot & Church, 1997; Weiner, 1992), especially as these demand creativity, shared learning and thus expressing one's thoughts and ideas. Students require a degree of familiarity with the knowledge and skillset required for the task to feel self-efficacious. Without a degree of perceived 'task-readiness' learners are unlikely to self-regulate their learning process (Bandura, 1993; Candy, 1991), and might instead avoid or retrieve from participation in the learning activity. As Bandura (1997) explains, "*people's level of (intrinsic) motivation, affective states, and actions are based more on how capable they believe themselves to be than on what might be objectively true*" (p2). The literature suggests that an educator is required in the learning process (Candy 1991). The role of the educator, as indicated in table 10 and further discussed in the next section, differs from that of the expert instructor in dominant, more traditional approaches education.

The experiential, real-world teaching-learning approaches categorised in self-driven learning may be considered exceptionally strong forms of learning. As indicated by Kolb (2003), "*most people learn 50% from what they see, hear, and read but as much as 80% from what they use and do in real life and up to 95% when they reflect on it to teach or help someone else*" (p.80). By experimenting with applying knowledge gained and skills developed in a real-world setting and reflecting upon it, discovering what works, why and how, and what not, deep learning takes place. The real-world setting creates opportunities for learners to discover their learning needs as they get confronted with situations that (may) require knowledge or skills they do not (yet) possess. This confrontation with an incompetence within a real-world setting represents what the SDL literature refers to as the trigger to initiate and execute a learning activity.

The situation described in the prologue is not uncommon. Whilst some learners thrive in experiential, highly autonomous learning situations, other learners are better served by first constructing a cognitive framework for understanding the concept before participating in an experiential learning activity. This is especially true in existential learning approaches in authentic settings, in which failure is not without consequences.

The potential weakness of this approach is that it may not be right for all students. When students feel they are not yet ready for the experiential learning task, hence feeling insecure, they may avoid undertaking the learning activity for fear of failure. Instead, the learner within such perceived high-risk settings may choose to concentrate on doing that what he/she is already comfortable with, which may be a small part of the entire learning process instead. Cultivating students' confidence or self-efficacy for the task thus appears to be a priority in (collaborative, contextualised) education, and whilst this seems to be an 'open door', it obviously presents a challenge that educators struggle with, considering the call for educational reform by a.o. European Commission (2021), Morris (2019), Murtonen and colleagues (2017), Giddings (2015) and Guglielmino (2013).

2.2.3.2 Cultivating learning confidence and task-related self-efficacy for contextualised learning environments

To cultivate learner confidence, or task-related self-efficacy, one requires a sense of authentic mastery (Bandura, 1977). Students need to be aware of their strengths and weaknesses to set attainable goals, and to develop strategies to achieve their goals. Authentic mastery is experienced when the learner perceives a degree of ‘stretch’, striving beyond the acknowledged competence level, yet within accomplishable reach (Bandura, 1997). For the teaching-learning process this means that a safe learning environment must be created that is tolerant of failure (without harmful consequences) (Politis, 2005), that stimulates to learn from and in collaboration with others (Rogoff, 1994; Bandura, 1977, Lave and Wenger, 1990), and that is supportive by means of formative feedback (Mezirow, 2000). A learning environment that facilitates “controlled failure” promotes experimentation and reflection (Webster, 2015; Bolinger & Brown, 2015) by eliminating perceived hierarchical structures and building a climate of trust (Hammond and Collins, 1990).

The SDL literature recommends the use of personal learning contracts (eg Brockett and Hiemstra, 1991, 2012, Merriam *et al.*, 2007). Learning contracts contain the student’s self-selected personal learning goals (PLGs) and the methods the student chooses to achieve those personal learning goals. Educators might allow students to choose personal learning objectives from a set of predefined competences outlined in the module’s intended learning outcomes (ILOs) or give them freedom to formulate learning goals in addition to those module specific, predefined competences. Freedom to choose learning activities to achieve their goals may be facilitated much the same way, by either offering a range of options and/or allow students to develop or choose a learning activity that has not yet been incorporated in the module. However, educators should be cautious of students’ tendency to overestimate or underestimate their personal abilities, as this may lead to them failing or avoiding certain learning activities, both of which negatively affects their confidence and their learning potential (Lucas and Cooper, 2004). Looking back at the example provided in the prologue, this would mean that Jack, even though highly autonomous, self-efficacious, intrinsically motivated, and self-directed, may have overestimated himself and thus may not have achieved his optimal learning potential. He might have ignored ideas and recommendations of fellow teammates, which could have further optimised the results and the learning effect if he had been open to them, or he might have chosen to stay within the boundaries of his

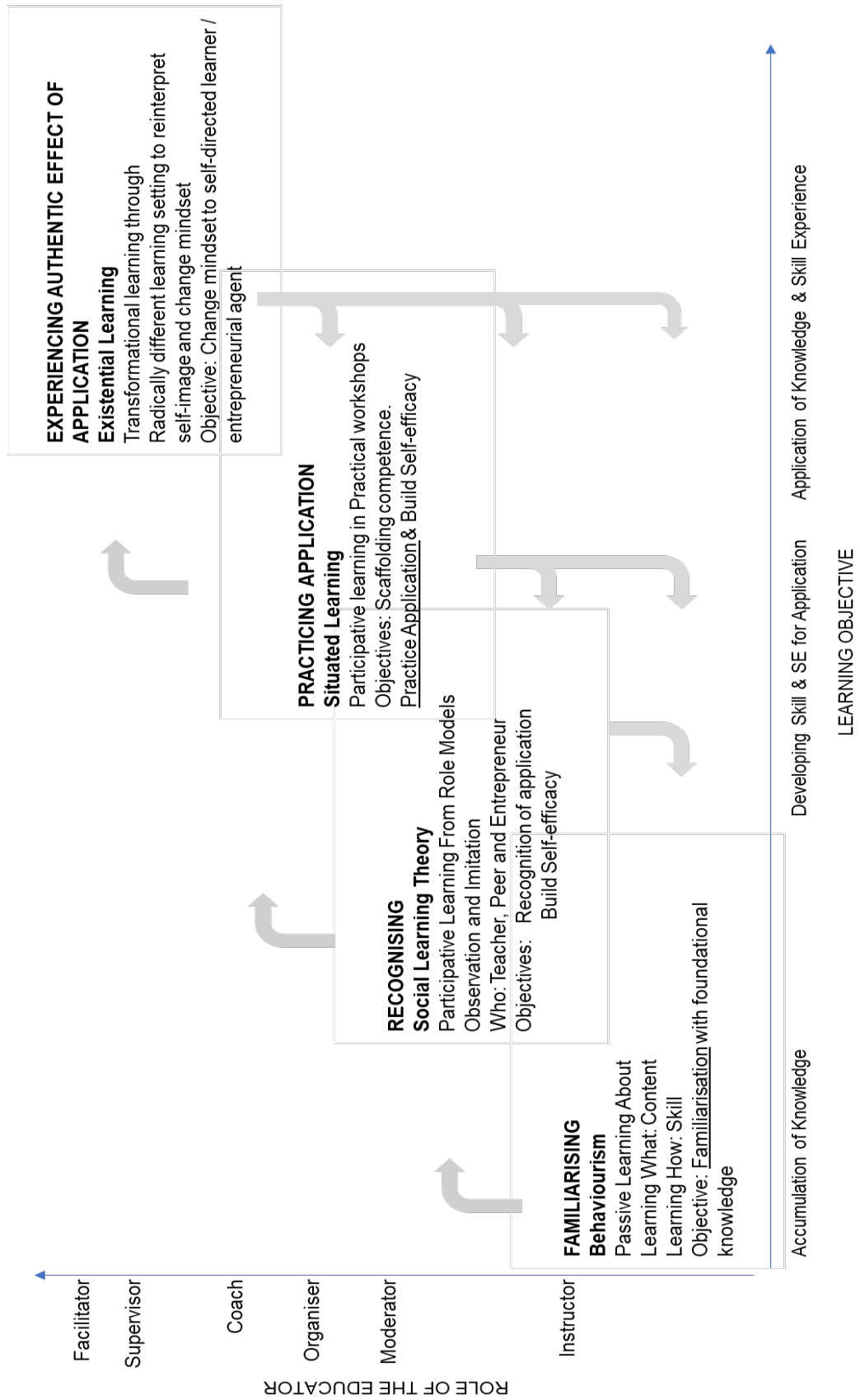
overestimated comfort zone, even if that seemed to not be the case in the eyes of Henry.

Establishing a teaching-learning process that enables students to commence their learning process at their personal level and pace starts with acknowledging that perception of task-readiness differs among students. Where one may feel efficacious with a basic level of understanding, another may wish to be much more knowledgeable before being confident enough to apply enhanced self-direction (Garrison, 1997; Grow, 1991; Kasworm and Yao, 1992). As with the scaffolded approach to knowledge development and the hierarchical approach skills development postulated by Dick & Carey (1985) and Merrill (1987), enhancing SDLLLR should therefore be considered along a similar maturation continuum (Garrison, 1997; Kasworm and Yao, 1992; Morris, 2019b). Maturation starts with determining a student's mastered level of task-related SDLR, to then match teaching-learning styles and activities with the identified maturity levels. Proper matching, as indicated earlier in this section, contributes to confidence building and autonomous motivation, as it facilitates students to gradually progress towards learner-independence as they move through the various maturity stages. Teacher roles change from initially directive, authoritarian towards facilitative and delegative supervision.

2.3 Proposed Teaching-Learning Framework for enhancing SDLR

Integrating the different frameworks and practices discussed in the different strands of literature with the stage-wise approach to enhancing SDLR (Grow, 1991; Kasworm and Yao, 1992), a convergent teaching-learning framework may be operationalised as illustrated in figure 9 below:

Figure 9 Proposed Teaching-Learning Framework for enhancing SDLR



Stage or Phase 1: Familiarising – applies the behaviouristic (Thorndike, 1911; Pavlov, 1927; Skinner, 1957) or ‘passive’ (Aadland and Aaboel, 2018) approach to learning *ABOUT* (Jamieson, 1984) a subject, to “know what” (Ronstadt 1987). Teaching methods used in this approach are instructor-led informational lectures, modelling and demonstration, rote learning, and choral repetition. Learning goals are pre-determined and apply equally to all learners. No distinction is made between learners’ previous knowledge, experience, and competence. Learners are motivated through increased knowledge and competence and enthused with a variety of activities to contextualise what is being learned. Within the contemporary blended approach to learning, this phase takes place predominantly prior to class-time (Kop and Fournier, 2010). Students enhance their knowledge level with the predetermined content at their own pace at home, prior to joining the organised class. This approach facilitates all students to share an equal level of cognitive understanding upon which activities can be developed in the classroom to expand upon this knowledge.

Scaffolding knowledge within the frame of what needs to be learned through passive learning methods enhances development of the students’ appropriate cognitive framework for understanding what is (to be) learned in the classroom (Merriam and Caffarella, 1991, 1999; Grow, 1991; Hammond & Collins, 1990) and how this is (to be) applied in practice (Biggs, 2003). Without such cognitive framework for understanding, or foundational knowledge, students risk misunderstanding and / or failure of the connected learning task and tend to avoid it (Eccles, 2005; Wigfield *et al.*, 2006), which has a negative impact on their learning potential. Passive learning alone, however, tends to put students in a teacher-dependency position (Giddings, 2015), undermining their ability to self-regulate or control their learning process (Ponton and Carr, 2000). Because most of the students found their educational background in predominantly behaviourist, and therefore teacher-controlled, learning situations, this type of learning environment might trigger their performance-motivation of achieving a grade, instead of sparking their interest in pursuing their own subjective standards for success, progress and understanding of a topic (Kischner and Hendrick, 2020, Harackiewicz *et al.*, 2016; Krapp, 1999). Without some form of application of the theory studied, its usefulness for real-world settings may remain unclear, thus leading to shallow learning (Biggs, 2003).

Stage or Phase 2: Recognising - applies the social learning (Bandura, 1977) approach in a participative (Aadlan and Aaboel, 2018) setting for learning how (Ronstadt, 1987) the newly gained knowledge is applied in authentic situations. Theory gains meaning through connecting it with real-world examples and representative role models.

Teaching methods used are tutorials, case studies, group discussions, pitches and presentations, (business plan) competitions, and interviews with subject experts.

Stage or Phase 3: Practicing Application – is grounded in the more pragmatic (Dewey, 1938) and constructivist (Piaget, 1936) theory of situated learning (Lave and Wenger, 1991). In this phase students gradually develop authentic competence in a participative (Aadland and Aaboen, 2018), in-class setting to practice and prepare how and with who (Ronstadt, 1987) to apply the newly gained knowledge in an authentic experience. Competence development is a process which occurs due to maturation and interaction of the learner with the subject in its contextual environment. The focus of this stage is on involving the learner in practical application of key ideas and course content for development of critical thinking and problem solving (Kasworm & Yao, 1992). Learners gain confidence in themselves as (knowledgeable and competent) co-creators in collaboration with their peers and teacher(s). Teaching methods used in this stage are generally supervised, interactive workshops and simulations.

The benefit of using participative teaching-learning approaches is that it allows students to progressively gain competence and confidence within a “safe” in-school classroom environment that mimics the real-world. In these interactive settings students can commence their skill development at an individual level and learn from each other. By ‘practicing’ tasks and activities that are reflective of real-world demands prior to having to exercise them in those real-world settings, students gain experience and therefore confidence in their own competence. As the SDL theory revealed, increased confidence, or self-efficacy, is the foundation of autonomous motivation to exploit (learning) opportunities in challenging, real-world settings, which makes this type of learning within entrepreneurship a particularly potential strength in enhancing SDLR. However, if not immediately followed up by the actual real-world experiment, the confidence gained within the participative learning experience may subside, which emphasises the need for direct linkage with an existential, authentic experiment.

Stage or Phase 4: Experiencing authentic effect of application – is grounded in Dewey’s (1938) progressive and Mezirow’s (2000) transformational learning theories. Learning activities are characterised by the radically different, existential (Robinson *et al.*, 2016) experiential approach to learning *THROUGH* (Jamieson, 1984) experiencing the effect of what is learned in an authentic setting (Macht and Ball, 2016). Students are expected to be more ‘self-steering’ (Aadland and Aaboel, 2018). Teachers no longer teach a subject matter but cultivate individual students’ abilities to learn. In this stage

learners have developed adequate learning skills and relevant conceptual and contextual understanding of the subject to be able to define their own learning trajectory and negotiate its outcomes with their instructor. Examples of methods used for this type of learning in formal education are apprenticeships, dissertation supervision and self-directed study groups (Grow, 1991), and in EE the student venture creation programmes.

The risk with existential experiential learning is that it is so radically different from what students are familiar with (Robinson *et al.*, 2016) that it is likely to not be right for all students (Kolb, 2003). As discussed, students need to feel ready for the experiential learning task, otherwise they are likely to avoid undertaking it for fear of failure. Instead, the learner might choose to concentrate on doing that what he/she is already comfortable with, which may be a small part of the entire learning process instead. When considering the variety of tasks associated with collaborative experiential learning activities, this situation is likely to occur and remain unnoticed by the educator. Another risk of immersing students in the experiential learning approach without the proper frame of knowledge and skill is that students may not be aware of what is required to succeed and/or not comprehend what behaviours are expected or required from them. As such they may over or underestimate their competence, which too negatively affects their learning.

With so much emphasis currently in EE literature and practice on promoting the student-venture creation programmes for developing entrepreneurial competences, the risks should be taken into consideration. The process of learning for entrepreneurial competence consists of an array of activities, each requiring specific knowledge and skill. Learning might benefit from continuously combining, not in a sequence of modules, but within a single module or even within a single learning activity. Take for example the competence of pitching. Many (if not most) students in undergraduate programmes are not eager to present or pitch in front of an audience. Learning about pitching, for example by using David Beckett's Pitching Canvas, then practicing pitching within a (safe) participative workshop and then pitching for representatives in an authentic setting (eg for investors or potential customers), is likely to be more effective than tasking students to obtain investment without building confidence first. In the latter case, the odds are high that the one or few students who are confident enough with public speaking will take on this task and therefore allowing those not confident to avoid the learning task.

The hypothesis arising from this synthesis, in answer to the question raised in the EE literature, “*how to teach entrepreneurship?*”, is therefore that preparing undergraduate (business) students in compulsory EE settings for self-directed learning readiness requires a teaching-learning approach that consistently applies the sequential learning phases throughout the module (as proposed in figure 9 on p.66) to build self-efficacy (H3).

2.3.1 Role of the Educator

This review suggests that the key objective of teacher-involvement in the teaching-learning process to stimulate autonomy, motivation and self-direction is to enhance learners’ task related self-efficacy. For educators this means that they need to be willing and able and/or facilitated to evaluate students’ individual task-readiness and then select and apply a mix of pedagogical approaches that matches with these levels of task-readiness of students. In practice this means that the educator should:

- ensure that foundational knowledge is available and accessible to students to study at their own level and pace,
- facilitate those skills required for the subject can be developed in a hierarchical maturity continuum that aims at reaching full competence towards the end of the module, yet by breaking it down in progressive levels, facilitates gradual development and commencement at individually mastered levels,
- organise (passive) knowledge transfer and (participative) task-practice activities to build confidence and task-related efficacy to precede learning activities in real-world setting
- apply a variety of pedagogies in each phase of the learning process,
- change their role throughout the module to match the individual students’ requirement.

This recommended process of continuously diagnosing and matching to enhance self-efficacy supports autonomy as well, as it centers around the aims, abilities and preferences of the student. However, to be truly autonomy supportive, the process does require proper framing around what it is that needs to be learned (Loyens, Magda & Rikers, 2008) as too much freedom tends to have the opposite effect (Greifeneder *et al.*, 2010; Schwartz, 2004; Flowerday and Schraw, 2003; Schwartz *et al.*, 2002; Iyengar and Lepper, 2000) and therefore calls for balancing freedom with guidance (Van Gelderen, 2011). At the freedom side of the scale diversity among students is acknowledged and facilitated through choice to work on different tasks in accordance with the interest and ability of the individual student. On the guidance side of the scale

educators need to provide a frame of reference within which students feel competent enough to exercise their freedom (interest). Students need to be able to commence tasks at their personal level of task-readiness without feeling incompetent in comparison with peers (Eccles, 2005; Wigfield *et al.*, 2006; Wigfield & Eccles, 2002; Pintrich and Schunk, 2002; Elliot & Church, 1997; Weiner, 1992; Atkinson, 1957).

2.3.2 Potential obstacles

To be able to implement these recommended teaching-learning practices, several seemingly persistent obstacles need to be overcome. On the learning-side of the equation there seems to be a lack of motivation among students to take control or ownership over their learning process (Van Gelderen, 2011). One of the causes of this attitude seems to come from the long history in passive learning that students have upon entering higher education (Bird, 2002; Guglielmino, 2013), and therefore delivering them to tertiary education unprepared for self-directing their learning (Chamorro-Premuzic and Frankiewicz, 2019; Mulcahy, 2019).

On the teaching-side of the equation barriers are encountered by the prevalence of traditional educational practices and educators' apparent traditional perspectives towards teaching and learning, holding on to educator authority and their role as knowledge experts (Morris, 2019b, p.641). Successfully developing co-operative learning climates begins with the educator acknowledging his/her own and the learners' presuppositions regarding how teaching and learning are to be organised (Merriam, 1993; Merriam *et al.*, 2007) and how this may affect the students' potential to develop their SDLR skills. Another important barrier to overcome is the time- and resource intensity concerned with personalized learning, as this requires individualized coaching and feedback (Beckers *et al.*, 2018).

2.3.3 Organising a cooperative social learning climate

An optimal collaborative or cooperative learning environment has learners work together in asymmetrical and varying roles, in a shared domain of interest with a community of people who interact and learn together to develop a shared repertoire for their practice, in other words situated in a community of (practical) learning (Lave and Wenger, 1991; Rogoff, 1994). Creating a co-operative social climate requires learners to feel genuinely appreciated regardless of differences in age, experience, background, or insights. It is "*concerned with how learners and educators feel about and experience themselves and each other in the group*" (Hammond and Collins, 1990 p.35) and therefore requires an atmosphere of openness, trust, and integrity, in which, as

previously mentioned, there is tolerance of failure (Caffarella, 1993; Long, 1992, 2000; Knowles, 1980). A climate of openness requires transparency about the role, and its rationale, of the educator within the social climate, whether as coach, motivator, facilitator, or delegator (Hammond and Collins, 1990).

For students to feel free to interact, the physical classroom arrangement plays an important role too. This should be comfortable, attractive, and conducive to the learning activity, as well as to sharing insights, collaborative creation and relaxing (Hammond and Collins, 1990; Pilling-Cormick, 1997). Upon entering a classroom, students set their expectations as to how they are supposed to behave. A traditional classroom that has all desks facing forward towards a educator's desk instantly places students in a passive mode, whereas a classroom that is set up with tables in groups reveals that a participative study approach is expected. Now that the Internet has taken its place in the (formal) learning environment, introducing a multitude of online activities (such as discussion fora, online collaboration tools, wiki's and MOOCs), the digital classroom has become a part of the physical climate (Hiemstra, 2009; Conradie, 2014; Kop, 2010; Kop and Fournier, 2010; Morris and König, 2020). Digital learning environments, even more so than physical classrooms, need to be attractive by means of ease-of-use, accessibility and navigation, tools and language used and facilitate possibilities for students to collaborate (Kop and Fournier, 2010; Conradie, 2014).

2.4 Conclusion

The notion that “to shed the ties of dependence and move to independence, a person must have learned the skills of independent study and be willing to use them” (Mocker & Spear, 1982, p.1) assigns an active role to educators in preparing learners for independent study through stages of increasing self-direction (Grow, 1991). The main argument for an iterative approach corresponds to Kolb's (1976) learning style inventory, that different kinds of students require different kinds of learning and therefore experience different levels of autonomy, self-efficacy, and motivation. The role of educators proposed in a stage-wise, mixed SDL model gradually changes from initially authoritarian, characterised by informational lecturing, coaching, and providing immediate feedback for dependent learners, towards facilitative and delegative supervision that is generally applied in internships, dissertation supervision, individual work, or self-directed study groups for self-directed learners (Grow, 1991). The level of match between educator involvement and learner ability and willingness to self-activate, self-management and self-monitor his/her learning process is related to higher levels of satisfaction in learning and higher levels SDLR (Garrison, 1997). Learners'

perceived ability to self-direct a learning activity is subjective at task level though, meaning that the perceived task-readiness is related to activities within the learning module.

Educational practice to enhance self-directed learning readiness requires focus on building task-related self-efficacy among students to motivate them to take autonomous control over their learning process. Building task-related self-efficacy requires a personalised approach to teaching-learning in which students have a degree of freedom to prioritise what needs to be learned, commencing at the level that matches with the students' mastered knowledge, skill, and self-directed learning readiness. Students need to be given an array of learning activities to choose from to achieve their personal learning objectives and supported by the educator in a role that matches with student's maturity level of SDLR. The teaching-learning process should be reflective of real-world situations in which students are confronted with real-world problems and challenges, providing sufficient stretch to be interesting to act upon, yet within the student's zone of proximity. Stimulating collaboration and cooperation requires an open, diverse, democratic, and non-hierarchical and non-threatening learning climate in which there is a high tolerance of failure and within a physical setting that invites students to actively engage in the learning activities.

Transformational, experiential learning requires a more facilitative approach to teaching, such as in coaching students through real-life entrepreneurial processes in VCPs compared to a more directive or passive approach to teaching entrepreneurship through lectures. How transformational learning can be achieved through EE is a much-debated topic in the EE literature that requires further rigorous research to come to a more fine-grained understanding of the how students experience learning in experiential EE.

The literature review has resulted in three (3) hypotheses to be researched:

- H1 That motivation for approaching challenging learning situations is predicted by students' perceived levels of autonomy (a) and self-efficacy (b)
- H2 That perceived levels of autonomy (a), self-efficacy (b) and motivation (c) are predictive values for self-directed learning readiness,
- H3 That different entrepreneurship education pedagogies moderate the predictive value of autonomy, self-efficacy, motivation for self-directed learning readiness with varying degrees, favouring the stage-wise, mixed pedagogical approach.

2.5 Review of Instruments to Evaluate self-directed learning readiness

Several (self) assessment instruments have been introduced to evaluate self-directed learning readiness. The most widely used assessment tool is the Self-Directed Learning Readiness Scale (Guglielmino and Guglielmino, 2021), also known as the Learning Preference Assessment (LPA). The [SDLRS website](#) states that “the SDLRS is a self-report questionnaire with Likert-type items developed by Dr. Lucy M. Guglielmino in 1977. It is designed to measure the complex of attitudes, skills, and characteristics that comprise an individual's current level of readiness to manage his or her own learning”. The assessment contains 58-statements to which students indicate their level of agreement from 1 (not at all true to me) to 5 (almost always true for me). Whilst the literature has validated the survey as relevant and reliable for (self) assessing SDLR (Guglielmino and Guglielmino, 2021), criticism is heard too (eg Brockett, 1987; Field, 1989; Straka & Hinz, 1996). One such argument against its validity and reliability, one that arises from this doctoral study's literature review, is that SDLR is not static but situational, as it is strongly related to self-efficacy, autonomy and motivation. As such, a learner may be self-directed learning ready in one situation, yet teacher-dependent in another.

Another instrument frequently used or referred to in the SDL literature is the Personal Responsibility Orientation to Self-direction in Learning Scale (PRO-SDLS) by Stockdale and Brockett (2011). The PRO-SDLS is an operationalisation of the PRO model of SDL of Brockett and Hiemstra (1991). The PRO-SDLS has been acknowledged as a reliable and valid instrument to measure self-directedness in learning of students in higher education and been incorporated in this research to reflect student behaviours. The instrument consists of 25 questions related to 4 factors; initiative, control, motivation and self-efficacy. Each question contains a statement and a 5-point Likert scale ranging from ‘totally disagree’ (1) to ‘totally agree’ (5).

This type of self-assessment may be susceptible to social desirability (SDR) - the tendency to respond in a manner that is consistent with that which is perceived as desirable by salient others (Kuncel and Tellegen, 2009) and to acquiescent responding (ACQ; Paulhus, 1991) - the tendency to select the positive side of the rating scale, regardless of item content (Weijters *et al.*, 2013). Assessing undergraduate learners this way about competencies they are yet unfamiliar with, such as entrepreneurship competencies and self-directed learning competencies, may therefore provide unreliable data.

3 Research Methodology and methods

Introduction

This chapter provides the philosophical and technical foundation of the research, by giving an account of the research design and the processes that underpin this doctoral study. It starts with a review of research designs found in the literature related to studies that consider efficacy assessment in (entrepreneurship) education. This follows with the presentation and justification of the research paradigm (ontology and epistemology, the chosen methodology and methods), with reference to the relevant self-directed learning and entrepreneurship education research paradigms.

The literature review has set out the uncertainties within the current debates surrounding the 'efficacy evaluation' of entrepreneurship education and revealed that we do not understand yet how to teach, nor how students experience learning in EE and how that affects their motivation to pursue learning opportunities. From the literature review a proposition was made for a teaching-learning framework to optimise the impact of education on enhancing self-directed learning readiness. This chapter explains how these issues have been explored in the case study chosen for this research, using a sequential mixed methods research approach. To thoroughly study the case, a combination of semi-structured interviews, cross-sectional surveys, open-question surveys and focus group interviews was applied. The current chapter outlines the design of this study, research questions, study participants, data collection process, instrumentation used, and process to analyse the data.

The chapter begins in section 3.1 with the justification of my ontological stance and theoretical perspective, drawing upon the aims of the work and my own role in the research. This section will justify the adoption of a relativist ontological stance with knowledge generated from an interpretivist theoretical perspective, operating through an inductive research strategy. Section 3.2 explains how entrepreneurship education operates within Amsterdam School of International Business, which is the case study organisation. The entrepreneurship education modules within the University are listed and the nature of these programmes are set out. Section 3.3 details the research methodology and design, including the research questions, sampling procedure, instrumentation, and the data collection and data analysis process, with the aim of demonstrating congruence with the research philosophy and the principles of ethical behaviour. The development of the correlational survey and interview guide from the

literature review is included in this section. Explicit information is given regarding the chronology of the data collection and data analysis stages.

3.1 Review of research designs in (entrepreneurship) education efficacy evaluation studies

A researcher's choice of framework, as highlighted by Lysaght (2011), is not arbitrary but reflects important personal beliefs and understandings about the nature of knowledge, how it exists (in the metaphysical sense) in relation to the observer, and the possible roles to be adopted, and tools to be employed consequently, by the researcher in his/her work (p.572). Eisenhart (1991) defined a theoretical framework as *"a structure that guides research by relying on a formal theory...constructed by using an established, coherent explanation of certain phenomena and relationships"* (p. 205). As such the theoretical framework serves as the guide, or blueprint on which to build and support the study, providing the structure to define the philosophical, epistemological, methodological, and analytical approach to the dissertation (Grant and Osanloo, 2014). Crotty (1998) proposes 'scaffolding' a framework for exploring research, in which the research starts from a lower level within the philosophical debate, taking a more operational stance. The starting point for scaffolding a research framework, Crotty (1998:2) suggests, should be to address two fundamental questions:

1. What methodologies and methods are to be employed in the proposed research?
2. How to justify this choice and use of methodologies and methods?

The methodologies and methods to be employed are determined by the research question of the enquiry. However, to answer the two initial questions on which methodologies and methods to use and why, Crotty (1998:2-3) advises exploration regarding the following four questions first:

1. What methods to propose that will meet the research question requirements: the techniques to collect and analyse data related to the research question or hypothesis.
2. What methodology governs the choice of methods: the research design supporting the chosen methods, linking the choice of methods to the desired outcomes.
3. What theoretical perspective supports the methodology of choice: the philosophical stance informing the chosen methodology to provide the context for the research process and grounding its logic and criteria.

4. What epistemology informs the theoretical perspective of choice: the theory of knowledge supporting the theoretical perspective and the methodology.

The entrepreneurship education research literature can be clustered in three methodological groups, with most studies published in the journals being qualitative, single case studies (52%), followed by quantitative studies that evaluate the extent and effect of entrepreneurship education (29%), and lastly mixed methods studies (17%) (Blenker *et al.*, 2014), all of which applied predominantly descriptive analysis methods.

Further discussion of the elements of the research design chosen for this doctoral study follows in the next sections. First however, prior to any discussion on the above four elements of epistemology, theoretical perspective, methodology and methods, the philosophy of ontology needs to be addressed, as understanding philosophy is important because, as Moon and Blackman (2017) put it, social science research can only be meaningfully interpreted when there is clarity about the decisions that were taken that affect the research outcomes.

3.1.1 Ontology

Ontology is “a specification of what exists” (Newby, 2014: 35). It is the theory of objects and their ties, about what exists in the human world that we can acquire knowledge about. It defines the researcher’s perspective on the nature and existence of the object being researched, to determine what ‘truth claims’ the researcher can make about reality and about what legitimacy can be given to such ‘truth claims’. Ontology can be divided in two paradigms: realist and relativist ontology. Realists’ ontology relates to the existence of a single real world or reality that exists independent of human experience, which can therefore be objectively studied, understood, and experienced. Relativist philosophy on the other hand ascribes reality or truth to mental constructions and therefore acknowledges the existence of multiple realities, relative to how individuals experience it at any given time and place. The scale of these two opposite ontological standpoints contains several variants identified in the literature: on the one end naïve realism, in which reality can be understood using appropriate methods, followed by structural realism describing scientific theory keeping its underlying nature uncertain. Between realism and relativism, critical realism captures reality by broad critical examination. Relativism can be scaled from “bounded relativism”, which recognizes the existence of multiple realities as mental constructions defined by cultural and social cognitive settings. At the other end of the scale, “absolute relativism” considers reality to be non-existent beyond subjects, existing instead as

multiple, intangible mental constructions (Moon and Blackman 2014). Social sciences, and educational sciences particularly, are placed in the paradigm of relativist ontology, realizing that no single truth exists, but is constructed either as agreed concepts of reality (bounded relativism) or as subjective experiences of reality (relativism).

To bring the focus back to the topic of this doctoral study, that of discovering or evaluating the potential efficacy of (entrepreneurship) education for a behavioural or attitude change with possible longer-term effects, the myriad of undefined and uncontrollable variables that determine human behaviour does not allow for a researcher to claim his or her findings to be generalizable across programmes, learners, teachers, universities, or cultures. Even within programmes, students generate different truths for themselves about what works for them, how and why in developing competences. The mere concepts of competence will be interpreted differently, and perceived levels of competence maturity will vary, affected by situations, context, and likely even the moment they are asked to reflect on them. The consequence of this belief is that any claims about what might work, why and how to transform instruction-dependent learners towards more self-directed, entrepreneurial learners, should be considered as subjective. As such, the ontology of realism fails to relate to the current doctoral project. A relativist ontological stance in comparison, arguably sits much closer to this research and its overarching objectives.

3.1.2 Epistemology

Epistemology, defined as ‘the study of knowledge’, or ‘the philosophical study of the nature, origin and limits of human knowledge’ (Britannica, n.d.), is about how we humans make sense of the world around us. It is concerned with the adequacy, legitimacy, scope, and methods of acquiring knowledge. Maynard (1994, p.10), as quoted by Crotty (1988, p.8) explains that ‘epistemology is concerned with providing a philosophical grounding for deciding what kinds of knowledge are possible and how we can ensure that they are both adequate and legitimate’, by investigating the origin, nature, methods, and limits of human knowledge. In education, theories of learning, and consequently, how the teaching-learning process is approached, designed and delivered, is influenced by the personal epistemologies of the teachers involved.

In considering the epistemology of my research, the question I asked myself is if the knowledge I seek with my research is something that can be acquired or if it is to be personally experienced, what the nature of knowledge sought is and what would be the relationship between myself (as the inquirer) and what is to be known (the relationship between EE pedagogy and SDLR).

The two main epistemologies that exist in the literature are positivism (or objectivism) and constructionism (or interpretivism), and both seem to resonate with the research approach and questions. Its overarching research question is therefore “How can entrepreneurship education contribute to preparing students for self-directed (lifelong) learning readiness?”. The research may be approached from both philosophical approaches. From a positivist epistemology, this study starts with the proposition of a ‘probable causal relationship’ between EE and SDLR. In this regard the SDL literature has been studied with the objective to identify and define what might be considered ‘objective criteria’ to be used for assessing (measuring) students’ SDLR.

The initial choice for this doctoral study was to deduct insight in “what works in EE” from observing changes in students’ behaviour as they progress through a stage-wise, multi-pedagogy entrepreneurship education module. Educators at the Amsterdam School of International Business (AMSIB) agreed to observe a sample of their students throughout the module and keep record of their behaviour on a bi-weekly basis, marking the maturity levels of different behavioural indicators that reflect self-directed learning readiness. The behavioural indicators were derived from the self-directed learning literature study, as presented in chapter 2 of this thesis. Observation results were scored on an observational framework developed for this specific purpose (see appendix 5) and discussed in bi-weekly focus group discussions. This strategy would have made the research epistemology constructionist, constructing meaning from the observations made by relating them to the behavioural indicators derived from the literature that are said to represent maturity levels of the studied learner characteristics. Due to the outbreak of SARS-Cov-2 and its consequential lockdown of society and the university, reliable observations could no longer be made as students were now only visible as digital (live) images on a screen.

The alternative research strategy chosen for this doctoral study to deduct insight in “what works in EE” was to use large surveys that represent multi-cases to test the theory of SDL in EE, using the objective criteria from the SDL literature to determine the possible correlation between EE and differences in student behaviour that indicate development of SDLR. As such, and treating myself as an independent observer, “letting the data speak” so to speak, to prove the validity of the assumed causal relationship, would make this research positivist. However, because the aim of the research is not to ‘prove the existence’ of a correlation between EE and SDLLL, but to gain a deeper understanding of what elements, how and why in EE might lead to higher levels of students’ perceived autonomy, self-efficacy, and motivation for SDLR, the research needs to be supplemented with qualitative data.

As explained in the previous sub-chapter, I do believe the units of analysis chosen for this study (individual students' self-reported, self-perceived maturity levels of autonomy, self-efficacy and motivation) to be relative to interpretation and affected by situations, context, and possibly the moment of reflection. As such the research requires converging broader experiences into a deeper understanding of the complexity of the whole (learning) situation. As a researcher, I therefore need to be more actively engaged in the research context and gather and analyse multiple perspectives through a mixture of quantitative and qualitative methods, collecting the views and experiences of diverse individuals and observers (students, coaches, teachers, program developers).

In addition to the positivist and constructionist epistemologies, several research paradigms have been developed. Placed within the matrix Positivist-Constructionist / Detached-Engaged, these alternative schools of thought include (in the quadrant positivist-detached) critical realism; (in the quadrant constructionist-detached) hermeneutics and postmodernism; (in the quadrant positivist-engaged) systems theory, and (in the quadrant constructionism-engaged) critical theory, structuration theory, pragmatism and feminism (Easterby-Smith *et al*, 2012 p.63). Considering my position, applying positivist and constructionist epistemology, between internal realism and relativism, systems theory and pragmatism both apply to this doctoral study, as it is dictated by the mixed methods research approach, which is discussed in the next section.

3.1.3 Systems Theory

Easterby-Smith and colleagues (2012 p.62) place systems theory, and especially its soft systems methodology (SSM) within both, engaged-positivism and engaged-constructionism. The theory assumes that complex systems should be studied as a whole, instead of breaking it down into their constituent parts. Educational processes are such complex systems, making it suitable for this doctoral study. SMM is characterised as a learning system that aims at taking purposeful action to improve existing situations, suggesting that the most applicable method for analysis would be action research, improving situations along the way and testing the effect of the changes made. I set out to take this route when Covid-19 hit, which caused a disruption in the research process and forced me to consider alternative research methods. Initially the intention was to observe participants in the modules and have frequent focus group meetings with a sample of teachers and students and to implement changes in a selection of classes participating in the EE module to detect impact of such changes. However, as the first Covid-lockdown suddenly forced all teaching to take place online,

teachers and students struggled, and change was not welcome. While it would have been possible to continue with the observative research, the unplanned nature of these sessions as part of a wider period of global crisis would have led to very different experiences, and potentially the data would not be representative of the typical learning situations that are at the heart of this research.

3.1.4 Pragmatism

Several authors have suggested that the foundation for mixed-methods designs is pragmatism, which maintains that ‘researchers should be concerned with applications, with what works, and with solutions to problems’ (Creswell *et al.*, 2003: 186). Pragmatism is associated with the use of mixed methods for data collection purposes (Patton, 1990; Tashakkori & Teddlie, 1998). Unlike studies that are theoretically constrained to one of the two dominant philosophical positions, ‘positivism’ or ‘constructionism’, pragmatism is pluralistic in its view of conducting research, using what works and hence combining the two philosophical positions. Research driven by pragmatism utilises the advantages of quantitative and qualitative data, valuing objective as well as subjective knowledge, and applying deductive and inductive analysis at different stages within the research journey (Creswell and Plano Clark, 2018).

As explained in the previous section, determining if an EE-SDLR relationship exists and attempting to explain how and why this relationship may be enhanced requires both quantitative and qualitative data to be collected and analysed in parallel. The complementarity instead of triangulation of results allows the use of results of one method (qualitative) to elaborate, enhance or illustrate the results from the other method (quantitative). The same data collection instrument can be used to explore relatively overlapping phenomena or different aspects of the same phenomena (Creswell and Plano-Clark, 2018), which makes the application of a convergent mixed methods research design the most appropriate choice for this doctoral study.

3.1.5 Research Questions & Conceptual Framework

The overarching research question of this doctoral study is ‘How can entrepreneurship education contribute to preparing students for self-directed (lifelong) learning readiness?’ and is specifically aimed at exploring the efficacy of a stage-wise, mixed pedagogical approach to entrepreneurship education, as proposed and

described in the teaching/learning framework (Figure 9, page 67) for developing undergraduate students' levels of self-directed learning readiness.

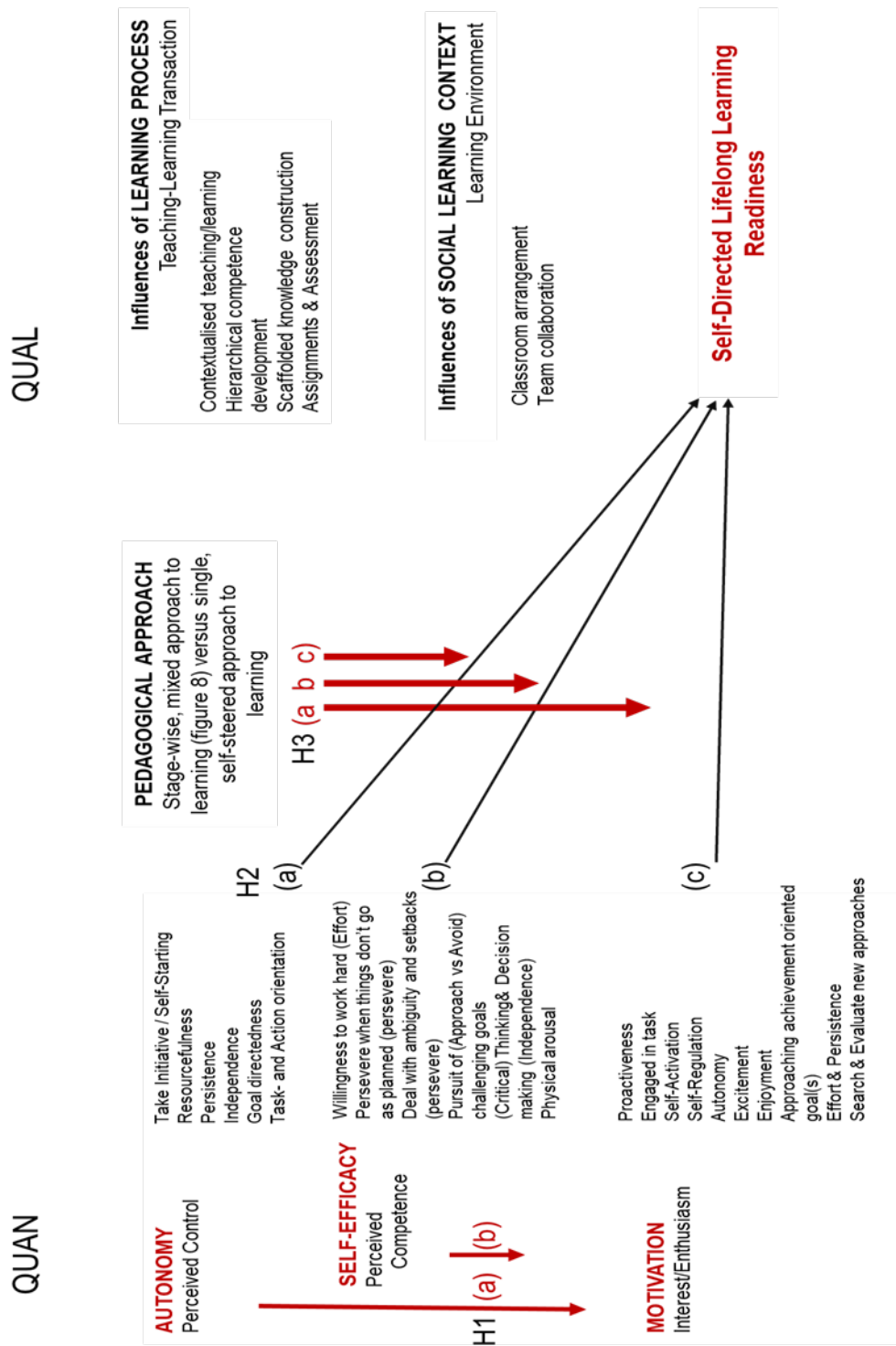
Using the conceptual framework for understanding the EE – SDLR relationship (Figure 10, page 84), the hypotheses that will be tested in this research are:

1. To what degree autonomy (a) and self-efficacy (b) predict motivation (H1);
2. To what degree autonomy (a), self-efficacy (b), and motivation (c) predict self-directed learning readiness (H2);
3. To what degree different pedagogical approaches to learning in entrepreneurship education moderate the predictive value of autonomy (a), self-efficacy (b) and motivation (c) for self-directed learning readiness (H3).

Because the development of maturity levels of these personal learning characteristics may be subjective to external influences, the research is extended to address the questions:

1. How do participants experience the teaching-learning process and how does this relate to their maturation of self-efficacy and autonomous motivation to pursue (self-directed) new learning opportunities?
2. How do participants experience learning in the social learning context of their EE module and how does this relate to the maturation of their self-efficacy and autonomous motivation to pursue new (self-directed) learning opportunities?

Figure 10 Final version of Conceptual Framework



3.1.6 Researcher Position

In the formulation of survey questions the researcher might be prone to bias, which may affect the reliability or relevance of the research as it may be distorted through the researcher's lens. This is especially true when the researcher conducts the research at his/her home institution, as is the case of this research due to the initial choice for applying participant observation research. The intensity of the contact required for this approach to empirical research, with biweekly focus group discussions with teaching staff and the participating teachers' involvement in the research as observers, required close collaboration with faculty. The SARS-Cov-2 enforced lockdown of society complicated the empirical research to the degree that I no longer had access to other institutions or faculties besides the Amsterdam School of International Business.

Changing from a purely qualitative research approach to include quantitative research, called for additional measures to avoid bias. Consequentially all reasonable means have been taken to reduce the likelihood of skewed results, towards survey responses due to the design of the surveys used for this doctoral study and towards interview responses. For this purpose, I have gathered input and feedback from EE experts during the ECSB 3E Summit at which I organised a practitioner development workshop for the purpose of validating my variables; from a group of teachers in other faculties of the Amsterdam University of Applied Sciences; from a focus group of teachers during a pilot study; from an additional selection of teachers to participate in the actual study's focus group discussions, and from a selection of students participating in the EE modules studied for this doctoral research. My 19 years of experience as a teacher was used to provide the proper framing of the survey and interview questions to the participants in this study.

3.2 Entrepreneurship Education at AMSIB

3.2.1 The Case Study: Venture Creation Project Co-Creative

Entrepreneurship (VCP CCE) at an Amsterdam based University

The entrepreneurship course studied for this research is based on the Young Enterprise Programme (JACP) programme. The JACP method of teaching entrepreneurship is used by numerous HEIs around the world. At AMSIB the module is named Co-Creative Entrepreneurship.

Introduction

The VCP, CCE, is a compulsory course in the curriculum given to first-year students. It is a full semester course over 20 weeks that combines different pedagogical approaches to EE. The CCE module applies Biggs constructive alignment theory (Biggs, 1984) and consists of a mix of learning activities, ranging from reflective observation to active experimentation, both in-class and out-of-class, to develop the relevant cognitive frameworks for students to understand how knowledge gained inside the classroom can be applied in real life situations. The course is divided in two separate but related modules, each running for the duration of 10 weeks and assessed with equal weighting.

During the first module, the emphasis is on learning about entrepreneurship and the material is delivered through a mix of lectures, case studies and interactive workshops. One day per week the students gather for a full day session, which starts with an explanatory, theoretical lecture and/or tutorial covering the theory they studied in preparation of the class. The tutorial is followed by a guided workshop and an unsupervised afternoon session to execute the lessons learned in the lecture and workshop. After the full day session, the students are expected to spend more time working on entrepreneurial projects. Learning goals and activities are pre-defined and consist of competency development in opportunity recognition, idea generation, concept development, stakeholder engagement, idea and concept validation, business modelling and business planning as well as pitching and presenting. University faculty give lectures and guide the workshops in collaboration with guest lectures from experienced entrepreneurs. The first module concludes with a business plan and pitch competition. Students are assessed on the learning activities they have executed and a reflection on their development. In this phase of the course, learning typically builds upon knowledge and understanding gained from observation, imitation, and modelling (social development): students are facilitated to co-construct their context specific knowledge and understanding with their teams (social learning theory).

In the second module, the students execute the business plan. During this second phase, the company is formally registered at the Dutch Chamber of Commerce and the students learn in accordance with existential, authentic, experiential learning theory. In this learning phase, the central focus is on learning from action and reflection on the authentic experience of starting and running the venture, transforming the experience into deeper learning to recognise opportunities, cope with liabilities of newness and self-direct their (learning) goals and process. Assessment of the students is based on a model of continuous observation and interaction regarding competence development and a critical reflection paper on the performance of the business and the student's development in the process of creating and running the new venture.

The mission of the CCE project is to create awareness among students of what it takes to successfully start and build a company from scratch and how the various elements (tools, competencies, disciplines, teamwork) in business development and -management fit together.

The CCE project plays an important role in the AMSIB curriculum because:

- it integrates the various first year business modules offered in the respective study programs,
- it largely contributes to the profile of graduates the AMSIB is aiming for: committed entrepreneurial business professionals,
- it offers an inspired hands-on setting in which students learn to apply the best available techniques for the development of a business start-up,
- it facilitates experience of the potential and the difficulty of teamwork in a business setting, and it generates awareness of what is needed from an individual to effectively contribute to the team process,
- it demonstrates that passion, commitment, and belief are powerful means towards a common entrepreneurial end.

The CCE project is scheduled in block 3 (CCE1) and 4 (CCE2) of the first year, comprising a total of 18 weeks in total (2 times 9). CCE1 and CCE2 are both awarded 4EC upon passing.

In total the project accounts for 8 EC, roughly equal to 230 hours of effective study (almost 13 hours weekly). In each first-year class two or three CCE-venture teams will be formed and guided by a CCE coach, a CCE business advisor and/or a (second year) student acting as assistant coach. During each of the two modules students need to

provide several deliverables to be assessed for a grade. An overall continuous assessment of individual performance determines the final grade to a large extent.

During block 3, in the first module of Co-Creative Entrepreneurship (CCE1) students develop several potential business models that propose how their envisioned student ventures may create, deliver, and capture value. In block 4, during CCE2, the most feasible business models are executed through their officially registered (student) companies.

In the project each CCE venture team goes through the following stages, which, in practice, may not be phased as strictly as presented here:

CCE1: Block 3

1. Idea & Business Model generation (week 1–4)
2. Research and validation (week 2–6)
3. Development of Business Plan (operationalization) and networking (4-7)
4. Pitching and presenting the Business Plan, Shareholders' meeting (week 8)

CCE2: Block 4

5. Implementation (week 11-16)
6. Market exit (week 17)
7. Reporting and evaluation (week 18–19)

Co-Creative Entrepreneurship

For Whom – Target audience:

The CCE modules are obligatory programme elements for all (approx. 750) students enrolled in the foundation year of the undergraduate International Business (BSc BBA) programme at the Amsterdam School of International Business, Amsterdam University of Applied Science. The students have varying backgrounds. Approximately 80% of the students enrolled are Dutch, 20% come from abroad. Approx. 75% comes from high-school and approx. 25% from vocational education (program director, 2021).

By whom – Teaching / Coaching Staff:

The entire entrepreneurial process (in CCE1 and CCE2) is guided by faculty of the Amsterdam School of International Business, all of whom have teaching expertise in one or more of the disciplines taught within the IB programme. One faculty member is assigned per class, for both modules and all elements taught within them. Faculty is selected on the grounds of experience with student guidance in experiential learning situations such as internships and dissertations. A preference is given to faculty with affinity with entrepreneurship. No specific entrepreneurship experience, either practical

or academic, is a prerequisite for teaching the module though. Faculty is reassigned to the module in subsequent years following positive experiences. As experience with guiding student ventures is gained, so is experience with entrepreneurship, even if in the role of academic supervisor/coach. Several faculty members (<25%) do have a practical background in entrepreneurship. Only 2 have an academic background (degree) in entrepreneurship. The majority (>80%) have a practical background in business and management, either practical or from a research perspective. In terms of preferred role of teaching the team of involved faculty is quite diverse. All faculty assigned to the CCE module have extensive experience with student coaching as well as with teacher-directive (theoretic) lecturing.

Prior to starting the with the module, the course director organises a voluntary 2-day train-the-trainer session for which experienced entrepreneurs are invited to take the participants through an intensive “pressure cooker” version of the start-up project. In this train-the-trainer programme faculty experience what students experience, and information is shared about new insights in the field of entrepreneurship. Discussions are held about new tools, tutorials and materials that may enhance the teaching-learning environment. Finally, the train-the-trainer programme acquaints the faculty with the (updated) module content, expectations, the digital learning environment, and each other.

Each teaching faculty member is supported by an assistant coach. These assistant coaches are students from the second year of the IB programme, who have enrolled in the honours’ course “Business Start-up and Team Coaching”. In this extra-curricular, honours’ programme they learn about, in and through coaching of venture teams. Besides a series of lectures, tutorials and workshops on coaching, these assistant coaches, all of whom have completed the CCE module in a previous academic year, practice their coaching skills in the CCE workshop sessions. Their main role as assistant coaches in the modules is that of peer-model. Having completed the CCE module themselves they share their experiences (good and bad) with the students. As such they serve as role models for first year students. Their close proximity to the first-year students benefits the decreasing or elimination of possible hierarchical structures and can inspire especially those students who may feel insecure. CCE teaching faculty are asked to approach potential assistant coaches during the semester preceding the CCE semester, which often leads to well matched teacher-assistant coach combinations.

The coaching team of teacher-coach and assistant-coach is completed with a business advisor. The business advisor is an experienced business professional or entrepreneur, screened and registered as volunteer at the foundation of Jong Ondernemen (Junior Achievement). These experts are randomly assigned to classes, however due to their relatively limited availability, they are assigned with preference to support faculty with the least practical experience. The intensity of the CCE schedule and the way it is organised within AMSIB requires these experts to be available half a day on a weekly basis, for at least the duration of the first 8 weeks of the CCE1 and on call during CCE2. The consequence of this time-intensity is that most experts are senior executives who have reached a phase in life in which they can reduce their involvement in actual business. Being of senior age and senior expertise brings the benefits of experience, though at the same time may increase the distance between the student and the expert from the role-model perspective.

For what results – Intended Learning Outcomes

- 1- to develop students' understanding of the coherence of their business and management related study modules,
- 2- to develop the students' entrepreneurial competencies, and
- 3- to facilitate a practical experience in starting and running a business to learn more effectively in the various majors of the IB programme.

What – Course Content; How – Pedagogical Approach & Why – Learning Goals

The course is positioned as an overarching project-based, experiential learning module that integrates the knowledge gained in the various business subjects taught in the foundation year.

Content & Pedagogical Approach

CCE1 – Block 1: From opportunity recognition/creation to business plan

In this phase of the course the students identify or create an opportunity for the student venture to be established upon. Elements covered in this phase are opportunity recognition, ideation, minimum viable product creation, validation, business model generation and validation, business planning, and pitching.

Knowledge that is expected to be applied in the real-world context of the student venture include that of marketing, sales, (business) management, (macro) economics, supply chain management, financial management and business research (Table 13). New knowledge provided in the course are dimensions of entrepreneurship and traditional and contemporary methods, models and frameworks commonly used in the field of entrepreneurship and its education (see lesson plan in appendix 5).

Students are encouraged to approach the value and venture creation assignment for CCE from the perspective of (business and research) ethics, responsibility, and sustainability. Students' ability towards self-monitoring and self-reflection, which are skills experimented with in the modules Personal Development, are called upon in the CCE module by means of the roles, responsibilities, and attitudes they take within the student venture teams and how they reflect on both their own learning process and their functioning within a real venture and team of founders.

In this module the teacher's role varies from lecturer and content expert for lecturing about the various topics, methods, and models, to organiser of interactive workshop and simulation activities and to coach and supervisor of students' individual learning processes. The teacher is accompanied by a student coach who has successfully completed the module in a previous study year as well as a field expert in the role of business advisor.

Learning goals are specified on a weekly basis and focus on the different phases in the entrepreneurial venture creation process. Whilst it is broadly accepted and understood that starting a business is not a linear process, the structure of the course is linear, however emphasis is given to the essence of iteration when validation activities demand it.

CCE2 – Block 2: Venture execution

In this phase of the student-venture creation project the students implement and execute their business plans in their formally registered companies. Students organize themselves within their companies in official roles. Because the teams in the student ventures are quite big (10-15 students per student company), the companies are immediately organized in departments; marketing & sales; production/procurement & operations; finance and human resource management. Management positions are assigned/divided by the team, including that of the Chief Executive Officer or Company Director. The student-management teams take over the role and responsibilities related to team management from the teacher-coach. As such, this phase of the student venture creation process not only addresses entrepreneurial competences, but also (international) business management competences, even if only for those holding a management position in the student-ventures.

The coach, assistant coach and business advisor are indirectly involved in the process, now in the role of learning-resource, process supervisor and coach. Students are encouraged to make their own decisions, make their own mistakes, find their own solutions to problems and difficulties they encounter, both with the company and with managing team dynamics.

Throughout the module, all learning materials related to elements of entrepreneurship are available to the students in the digital learning environment.

Assessment

The CCE1 module concludes with a business plan and pitch competition. Students are assessed for group assignments and their individual contributions to the learning activities they have executed and a reflection on their development. Assessment is mainly formative. In this phase of the course, learning typically builds upon knowledge and understanding gained from observation, imitation, and modelling (social development): students are facilitated to co-construct their context specific knowledge and understanding with their teams (social learning theory).

Assessment of the students is based on a model of continuous observation and interaction regarding competence development and a critical reflection paper on the performance of the business and the student's development in the process of creating and running the new venture.

The Modules of the Control Group

The other AMSIB EE module studied for this research is the 8 EC project-based learning module Business Internationalisation (BSI), which is an obligatory, full-semester module in the second-year programme. The objective of the module is to develop a business scaling opportunity in an international market for an existing Dutch small to medium sized enterprise (SME).

In the first week of the course the students are assigned teams, a (real) Dutch company and a geographical market towards which the company might scale its business. In the first module the emphasis is on conducting international market(ing) research to determine market attractiveness and prerequisites for potential market entry. In the second module the students construct an international business scale-up plan. The market research paper and the business scale-up plan are both submitted in report format for assessment and presented to an assessment team consisting of teaching staff at AMSIB. The theory to be applied in both modules is considered to be familiar to the students and therefore no time is scheduled for knowledge development / discussion. The role of the educator is restricted to that of process coach, for which a timeslot of 25 minutes is assigned per team per week to discuss progress and any issue that may have arisen during the week commencing the coaching session.

The module Business Consultancy Clinic is similar to the Business Internationalisation module, with the exception that this module is taught in the third

year of the AMSIB IB programme as an elective and involves real-live companies and assignments instead of simulated assignments. The role of the educators involved in this module is a mix of team supervision, teaching related to business consultancy skill development and process coaching.

3.3 Study Design

The primary goal of this doctoral study is to gain a deeper understanding about the potential of the variety of pedagogical approaches that is so characteristic for entrepreneurship education to enhance self-directed lifelong learning readiness. The conceptual framework developed for this study proposes that entrepreneurship education is positively related to self-directed learning readiness, in that more advanced levels of autonomy, self-efficacy predict higher levels of (intrinsic) motivation, and higher levels of autonomy, self-efficacy, and motivation predict higher levels of self-directed lifelong learning readiness. The literature review revealed a general agreement among EE scholars that entrepreneurship can be taught, but that insufficient understanding is available about how to teach. In that respect, the review also brought forward the hypothesis that a stage-wise iterative approach to learning within, across and throughout the various elements of entrepreneurship education might have higher levels of effectiveness than single pedagogical approaches. As such this doctoral study seeks to identify and explain potential benefits of pedagogical approaches commonly applied in entrepreneurship education for the practice of teaching that aims to enhance students' self-directed learning readiness.

Because the field of EE is so broad and fragmented, I have chosen to focus this study on a case study that applies this proposed pedagogical approach and that is representative for the widely taught and promoted JACP. Within the selected case study, I applied a concurrent or parallel (QUAL+QUAN) mixed methods research design (Creswell and Plano-Clark, 2018). This design was not intended at the start of the research process but emerged as the study progressed, the circumstances changed due to the outbreak of SARS-Cov-2, and new insights emerged from the collected data.

Creswell and Plano Clark (2018) refer to a similar mixed method design as convergent as *"it brings together the quantitative and qualitative data analysis for comparison or combination to obtain a more complete understanding of the phenomenon studied"* (p.65). Prior to executing the mixed methods study employed for this study, I had formally and informally interviewed a panel of EE experts at the Amsterdam University of Applied Science to expand my own vision of what makes entrepreneurship education pedagogy different from other pedagogies, how that relates to teaching and learning, and how this may be reflected in students' behaviour. The intent of this initial orientation process was to become aware of my own preconceptions to avoid or minimise bias as well as to be able to develop a holistic observation

framework (appendix 5) to be used to evaluate students' self-directedness by means of verifiable behaviours which could be used for 180° and 360° evaluation and feedback.

Upon completion of the draft observation framework, it was discussed with and critically evaluated with faculty assigned to teach the module, as well as with a random selection of entrepreneurship educators within other faculties of the Amsterdam University of Applied Science. Once the feedback was processed, a pilot study was conducted with a selection of teachers within the case study at AMSIB to test and evaluate the proposed observation framework. In the first week of February 2020 the final version of the observation framework was distributed to the participating faculty (6 teachers and their assistant coaches), who applied it to score and detect changes in the behaviours observed from a sample of 10 randomly selected students. The intention was to keep record of the selection of students every two weeks, over the period of the 20-week semester and to follow each observation session with a focus group discussion about the detected and recorded behavioural changes. Only 3 sessions were conducted though (week 1 as baseline, week 3 and week 5), each followed with a focus group discussion to share the results. Unfortunately, the outbreak of SARS-Cov-2 and its subsequent school lockdown interrupted this (qualitative) data collection process. Observing students' natural behaviour in the entrepreneurship education classroom setting was obstructed by the fact that students now could only take part in the module through the online videoconferencing application Zoom, which limited the observable behaviour to such a degree that the results might have not been representative. The teachers involved in the process no longer wished to participate in this study, as they were struggling themselves with keeping their students motivated to participate with some form of enthusiasm for the now complicated entrepreneurship education module. This situation forced me to rethink my approach to the research.

To minimise delay in the process of this doctoral study, I decided to transform the observational framework into a cross-sectional (self-administered) survey questionnaire, transforming the research design from initially purely qualitative to a mixed methods design, for which I followed the 4 steps characteristic for concurrent mixed-methods design. The steps consist of data collection, data analysis, data merging and data interpretation (Creswell and Plano-Clark, 2008). Prior to the start of the research, I have conducted another pilot study to test and evaluate the survey questionnaire that was constructed from the observation framework and adjusted with additional information gained from the literature review. The following section presents the process and results of the pilot study, before presenting the procedures applied for

survey administration, population and sampling, data collection and data analysis and validation.

3.3.1 Pilot Study

Data for the pilot study was collected using the newly developed survey (appendix 3) that was sent to 624 students who were enrolled in the compulsory VCP in the Spring 2020 semester. I distributed a web-based survey using Qualtrics software. It consisted of 22 questions that gathered data on learner characteristics (motivation, confidence and autonomy), preferred learning style and perceived self-directed learning readiness. The survey was first distributed via email in July 2020; a reminder to complete the survey was sent in August 2020. 249 completed surveys were received, resulting in a 40% response rate; however, I removed 34 observations due to incomplete data which reduced our sample size to 215 observations. Table 11 provides descriptive statistics about the data sample.

Table 11 Descriptive statistics Pilot Sample

Frequency counts of the sample, N=215		
Variable	Count	%
Gender		
Male	141	66%
Female	72	33%
Career Intention		
Management	137	64%
Entrepreneurship	78	36%
Experience		
Family Business Background	89	41%

The independent variables of learner characteristics were measured using a 5-item Likert-scale questions. Motivation, self-confidence and autonomy were proxied using statements of agreement on various topics such as talking to stakeholders, accepting challenges or determining goals. To proxy the change in motivation, self-confidence and autonomy, respondents were asked to indicate whether their competences changed as a result of the VCP. Cronbach's alpha for the independent variables was 0.759.

The dependent variable, self-directed learning, was measured by drawing on and adapting questions from the Self-Directed Learning Readiness Scale (SDLRS) (Guglielmino, 1977). Prior studies have used SDLRS to explore learner readiness – the attitudes, abilities and motivation – to engage in a self-directed learning process (Guglielmino, 1977). Characteristics, capabilities, and behaviours associated with SDL readiness, as indicated by the SDLRS, include independence, confidence, persistence,

initiative, creativity, critical (self-)evaluation, patience, self-efficacy, curiosity and a desire to learn. From the SDLRS, I adapted 5-point likert scale questions related to learning styles, goal setting and planning. Cronbach's alpha for the dependent variable was 0.801.

For the moderating variables of EE pedagogy, I measured the preference of learning approaches from the two modules of the VCP. Respondents were asked to rate their preference on a scale of 1 to 5. The reliability score, Cronbach's alpha, was 0.895.

Data was also collected for control variables, controlling for gender, career intention, and family business background. For example, the respondents were asked whether they intended to pursue a career in management in multinationals, small businesses or entrepreneurship (self-employment). These control variables were coded as categorical or dummy variables.

Confirmatory factor analysis was conducted on the independent variables of learner characteristics and dependent variables of self-directed learning readiness. The varimax rotation factor analysis extracted principal components and loaded into distinct constructs with values greater than 0.6. These factor structures were then used as measures for the independent and dependent variables in the multiple regression analysis.

Because the study was conducted with the cohort of students who were affected by the Cov-SARS-2 lockdown that occurred in week 5 of their VCP module and no pre-intervention data had been collected, the results of this study could not be used to draw generalisable conclusions.

Following the pilot study, two focus group interview sessions were held with a total of 18 students who had participated in the pilot study and 4 educators, to get their feedback on the questionnaire and the answer choices. The input gained from these participants was used to adjust the questions and answer options, so that the results for the final survey questionnaire would give an optimally reliable and realistic picture of the students' experience.

Following final corrections in the fall of 2020, the first phase of quantitative data collection took place pre-intervention, at the start of the 2020-2021 spring semester, in February 2021, and was followed up with a post-intervention at the end of the 2020-2021 spring semester. In both phases of the data collection, I have conducted web-based surveys. For the pilot, as explained before, I used Qualtrics and for the final

research I switched to Praioritize® to enable students to use their results for self-and peer-evaluations. The latter facilitates personal dashboards which could be used by the students to track their progress and compare their performance level with the average of their class and their year. Examples of the questionnaires are provided in Appendixes 1, 2 and 3.

3.3.2 Survey Administration

To determine the direction of the relation (positive, negative) and its strength (high, medium, low), the autonomy, self-efficacy, motivation, and enhanced self-directed lifelong learning readiness scores are statistically correlated. Correlational research helps to identify relations among variables (Baarda, 2010), but a limitation of correlational research is that it cannot identify why and how the relationship comes into being. A positive correlation between EE and SDLR could mean that (a) EE influences autonomy, self-efficacy, and motivation and thus enhanced SDLR, (b) enhanced SDLR influences autonomy, self-efficacy and motivation in participating in EE, (c) autonomy, self-efficacy and motivation in EE and enhanced SDLR influence each other, or (d) EE and enhanced SLDR are influenced by other, non-measured variables (teaching-learning transaction and learning context). To determine cause and effect, an experimental study is necessary, which is the underpinning for the choice to extend the case study with a quasi-experiment, adding the exploration of different (single) pedagogical approaches with other student groups to the case study.

In the quasi-experimental research one or more (independent) variables differ to determine the effects on other (dependent) variables. For this purpose, additional research samples have been selected, each representing a student cohort exposed to a single-pedagogical approach to EE (passive, self-driven simulation and self-driven real-world) within the same study programme. Achievement is assessed in three of the four groups, as the response rate to the post-intervention survey questionnaire in one group (passive pedagogy) was insufficient to provide statistical reliability. If the case study sample performs significantly better, the conclusion might be drawn that a mixed, multi-pedagogy approach to EE might be more effective to enhance SDLR than single pedagogical approaches. While the pedagogical variables are altered to determine their effects on outcomes, other variables that potentially can affect outcomes must be kept constant (e.g., learning conditions).

In the qualitative phase of the study, following the initial round of interviews and the collection of the pre-intervention survey data, four sets of data were collected from the same population, using open question online surveys and a focus group discussion to collect the experiences of the students. Additional data was collected from EE experts and teachers using semi-structured interviews and a focus group discussion.

3.3.3 Population and Sampling Procedure

The sampling strategy applied for this research was grounded in the choice for conducting a mixed methods experimental design to gain enhanced understanding (Creswell and Plano-Clark, 2018) of the proposed correlation between EE pedagogy and self-directed learning readiness. The quantitative data was collected to verify or nullify that a correlation 'exists'. The qualitative data was collected from participants in the quantitative samples to gain a deeper understanding of the findings from the quantitative data.

The criteria used for inclusion in the research sample are that i) all participants are formally registered students in the undergraduate International Business programme of the Amsterdam School of International Business, that ii) they are enrolled and actively studying in any one of the four EE modules, and that iii) they have given their consent for using their information for the purpose of this research. The reason for selecting this population and sample was due to convenience of me working at the Amsterdam School of International Business and therefore having access to these participants.

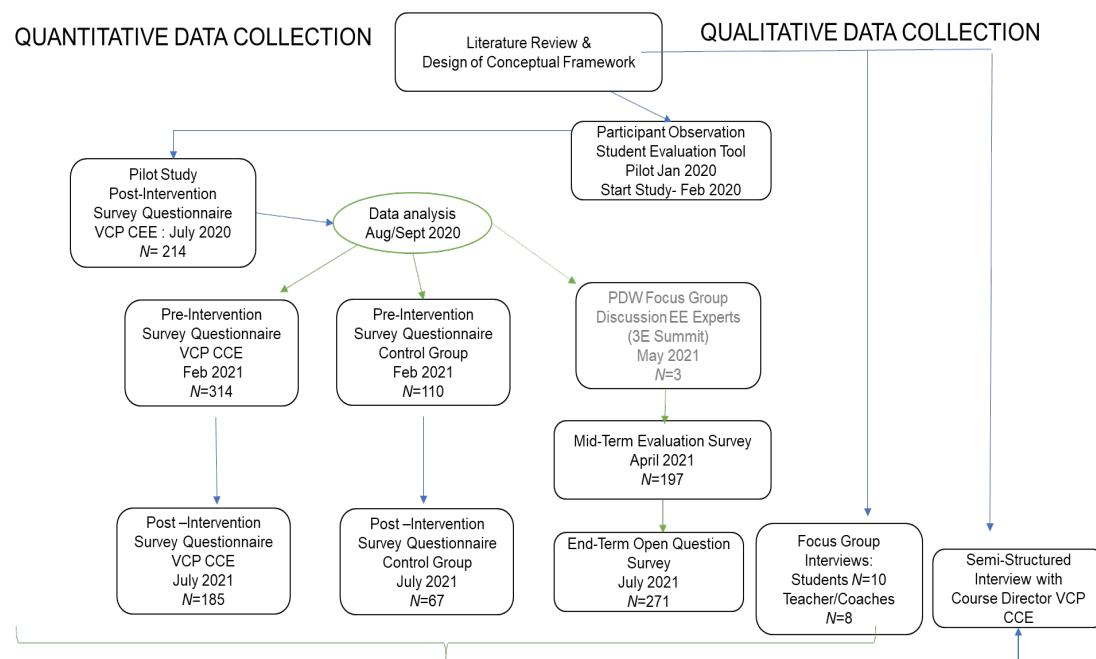
Mixed methods theory explains that to provide explanation to phenomena found in the quantitative data, the qualitative sample should be purposefully selected from the quantitative data sample. As such the selection criteria for the qualitative part of this research were for students that they had completed the pre-intervention survey questionnaire and had given their consent to participate in the follow-up qualitative research. The selection criteria for teachers were that they were currently employed by AMSIB and assigned the teaching/coaching tasks in the VCP CCE; for the EE experts to be either a university lecturer or research of EE.

3.3.4 Data Collection Procedures

After designing the conceptual framework and developing, testing, and adjusting the research survey tools deriving from it, authorisation was obtained from AMSIB's research director and the course directors. From then the research went through

several steps (Figure 11), the details of which are described in the following subsections.

Figure 11 Flow Diagram Data Collection Procedure



To be able to verify the proposed correlations, quantitative data was collected prior to and following the intervention. To determine if identified results are the effect of the intervention (or experiment), data was also collected from participants in a different stratum (EE module) to serve as a control group. The qualitative data was collected from the participating respondents to the pre-intervention survey questionnaire, from the intervention sample as well as the control group, for which a personalised invitation was sent to all respondents who had indicated their willingness to participate in the qualitative part of the research.

To avoid bias, multiple sources and formats of qualitative data were triangulated by including open question surveys, and semi-structured interviews and focus group interviews with teaching/coaching assistants and teachers (Figure 11).

3.3.4.1 Procedure for Quantitative Data Collection

Four data sets have been collected to evaluate the EE-SDLR relationship. Two populations of students were invited to take the survey questionnaires, at two subsequent moments in their EE study programme.

The procedure used to collect quantitative data was a stratified-random approach, initially sorting the EE modules taught at AMSIB into groups, or strata, based

on their pedagogical approach to teaching entrepreneurship. Once the programmes were identified, data was collected from these using a random sampling approach for which I posted an open invitation with a hyperlink to the pre-intervention survey questionnaire in the digital learning environment of the EE modules. All students within these strata have equal access to this digital learning environment and could self-select their participation in this research, therefore with equal chance and without bias. The teachers of the modules were approached with the question to draw attention of the students to the surveys by mentioning it to the class during the introduction of the first two EE sessions for the pre-intervention survey and during the last two EE sessions for the post-intervention survey.

The administration of the self-assessment survey was facilitated by Transparency Lab, a Dutch SAAS company specialised in team assessment to predict behaviours. Transparency Lab's Praioritize software was chosen for the benefits of the software providing personal (performance) dashboard to participants. These personal dashboards revealed the individual students' score on entrepreneurial self-direction in comparison to the entire sample, which they could use for self-reflection assignment as well as for the peer-reflection assignment in the modules.

Both self-assessment surveys (pre- and post-intervention) were delivered in electronic format with an instructions section accommodating the survey questionnaire. The instructions section explained the purpose of the research and instructed participants how to correctly take the survey, including the importance of giving consent. The information section also clearly stated that participation in the survey was completely voluntary. Only upon giving consent to participating in the research and for the researcher to use the data provided in the survey, were the participants taken to the survey questions.

3.3.4.2 Procedure for Qualitative Data Collection

The qualitative data strand has been collected in two phases, during and after the EE modules. During the intervention qualitative data was collected from students in the case study to understand how they experienced the stage-wise mixed-pedagogical approach applied in the VCP Co-Creative Entrepreneurship. After the intervention qualitative data was collected from both samples to explain the outcomes of the research, variation between students and samples, and to assess how context, in this case the consequences of the SARS-Cov-2 lockdown situation, influenced the

outcomes. Mixing qualitative data in this manner with quantitative data enriches the experimental results (Creswell and Plano-Clark, 2018). To minimize the possibility of the qualitative data introducing bias into the research experiment, a variety of data collection instruments and sources have been used.

To collect experiences from the students in the EE modules, two open-answer survey questionnaires were developed in Qualtrics and the students who had indicated their willingness to participate in the qualitative part of the study were approached via personalised email.

- In week 6 all selected students in the main sample (CCE) were invited by personalised email with a hyperlink to complete the online mid-term open-answer survey questionnaire in Qualtrics, which aimed to collect their experiences with to the different pedagogical approaches used in their iterative approach to learning; and,
- All selected students in the control group were invited by personalised email with a hyperlink to complete the online mid-term open-answer survey questionnaire in Qualtrics, which aimed to collect their experiences with the single pedagogy self-steering approach to learning.

In the final week of the academic semester (on 21 June 2021) all selected participants from both samples were invited by personalised email with a hyperlink to complete the online end-term open-answer survey questionnaire in Qualtrics aimed at collecting their overall experience.

The mid-term open-question survey contained 5 questions, 3 of which asked to rate and 2 to explain the perceived contribution of the various pedagogical approaches to the students feeling of being in control and having choice (autonomy), feeling empowered and encouraged (self-efficacy), and feeling motivated to take entrepreneurial action.

The end-term open-question survey consisted of 4 questions, 2 of which contained a scale question – one scaling satisfaction (enjoyment) with the module and one scaling active involvement in comparison to their team members. The open questions asked for elements of and arguments for dissatisfaction, satisfaction, motivation for engagement and disengagement, and what they would change if they were in control of the module (Table 12).

Table 12 Qualitative Survey Questions

Mid Term Survey Scale Questions	Mid Term Survey Open Questions	End Term Survey All Participants in Pre-Intervention Survey
Q1 To what degree (1 not at all - 5 absolutely) did you experience the lectures about entrepreneurship to prepare for: a. independently taking control over the learning tasks in the project? b. feeling confident about your ability to succeed with the learning tasks in the project? c. feeling enthusiastic about conducting the learning tasks in the project?	Q4. Describe your experience with the assignments involving external stakeholders: a. What obstacles/reluctances/ concerns did you experience? b. What did you do to overcome these obstacles/reluctances/ concerns? c. What would (have) better help(ed) you overcome these obstacles/reluctances/concerns?	Q1. On a scale of 1 (not at all) to 10 (absolutely), how much did you enjoy this entrepreneurship module?
Q2 To what degree (1 not at all - 5 absolutely) did you experience the workshops in the entrepreneurship module to prepare you for: a. independently taking control over the learning tasks in the project? b. feeling confident about your ability to succeed with the learning tasks in the project? c. feeling enthusiastic about conducting the learning tasks in the project?	Q5. Describe how the process in the course (theory-workshop-learning task) affected your: a. feeling of empowerment (feeling good about yourself) b. motivation to find out more c. enthusiasm for the course / starting the actual business	Q2. What elements did you enjoy / like most in the module / student company? Q3. What elements did you enjoy / like least or did you miss in the module / project?
Q3 To what degree (1 not at all - 5 absolutely) do you agree with the following statements: a. I experienced sufficient freedom to conduct the entrepreneurship assignments as I saw fit b. I felt comfortable performing the entrepreneurship learning activities c. I enjoyed the entrepreneurship learning activities		Q4a. If you were the course director, what would you change about the module? Q4b. Explain how that would lead to better performance / appreciation / student engagement

The focus group interviews were held online due to the SARS-Cov-2 lockdown situation. The participants were given 3 questions (Table 13) to discuss together in group discussions in break-out rooms as to decrease the chance of bias from me being present in the role of researcher and AMSIB faculty. Unfortunately, it was not permitted to record the PDW session at the ECSB 3E Summit. The other three sessions have been recorded and transcribed. For each of the focus group interviews I made use of

the Miro Board application to capture the most essential points, in this case student behaviours indicative of autonomy, self-efficacy and motivation, and the influencers from the teaching-learning process and social learning environment.

Table 13 Qualitative Focus Group Interview Questions

Q	Focus Group Interview CCE Students (Team Leaders)	Focus Group Interview CCE Teachers
1	What did you experience were the most challenging experiences with motivating / engaging members in your student venture to take ownership for tasks and activities?	What elements in the CCE module did you experience as affecting students' - autonomous behaviour (positive and negative) -confidence (positive and negative) -motivation and engagement (positive and negative)
2	What were your best practices to motivate / stimulate your team members to take ownership for tasks and activities?	What were your best practices to help students gain -autonomy -confidence -motivation
3	What are the main lessons you learnt in your role as team leader in motivating others to take ownership over their (learning) tasks?	What best practices did you encounter from students and your assistant coach to enhance students' -autonomous behaviour -confidence -motivation

3.3.4.3 Population and sampling in the quantitative data collection phase

In February 2021, 1043 students participating in the different EE modules taught at AMSIB were informed about the 22-question pre-intervention self-assessment survey questionnaire (appendix 1) and invited to participate in the research environment (Brightspace), which contained a hyperlink to the online survey. The response rate was highly satisfactory, at 69% (Table 14). During the final week of the spring semester 2021 (21-25 June 2021), all the students who had completed the 2021 pre-intervention survey were invited to complete the 22-question post-intervention self-assessment survey questionnaire (appendix 2). The students were contacted via email with an invitation and hyperlink to the online survey. The population count in the post-intervention survey was considerably lower than the response rates of the 2021 pre-

intervention surveys, though with an average response rate of 50% still sufficient to meet the threshold of 95% reliability with an error margin of <5%.

Table 14 Study population Quantitative Survey Questionnaires

RESEARCH PARTICIPANTS	QUANTITATIVE SURVEY DATA COLLECTION					
	Pre-Intervention			Post-Intervention		
	Invited	Participated		Invited	Participated	
Sample Group	Count	Count	%	Count	Count	%
Main Sample (VCP CCE 2021)	735	504	69%	420*	185	44%
Control Group 2021	308	222	72%	212	176	83%
Total n=	1043	726	70%	632	361	57%

* 84 accounts were removed due to students having withdrawn

3.3.4.4 Population and sampling in the qualitative data collection phase

The PRE-intervention survey received n=257 usable responses for the qualitative phase of the study. This sub-sample of students had indicated in the demographics section of the survey questionnaire that they were willing to contribute to the qualitative research. The students who indicated their willingness to contribute had ticked the relevant box to give their consent to be contacted for further inclusion and left their email address. The mid-term survey invitation was distributed via personalised emails to all n=146 students in the main sample (CCE), n=135 of whom started the survey, and n=114 having completed the survey wholly or partially. The end-term survey invitation was distributed via personalised emails to all n=347 students across both sample groups, n=271 of whom completed the survey (wholly or partly), as indicated in table 16 below.

Table 15 Study population Reflective Qualitative Survey Questionnaire

RESEARCH PARTICIPANTS	QUALITATIVE SURVEY DATA COLLECTION					
	Mid Term Reflection			End of Term Reflection		
	Invited	Participated		Invited	Participated	
Frequency counts population samples	Count	Count	%	Count	Count	%
Sample 2021 (VCP CCE)	146	114	78%	146	116	79%
Control Group 2021				201	155	77%
Total				347	271	78%

The instruments used for this purpose will be presented in the section about the instrumentation.

3.3.5 Instrumentation

For the cross-sectional survey a unique assessment framework has been developed that is founded upon a combination of existing self-assessment surveys (Appendix 4). To be able to 'measure' maturity levels of the various behaviours identified as indicative of these constructs, elements were taken from the most frequently mentioned and widely used assessment frameworks in the SDL literature and in the EE literature. The dependent variable, self-directed learning, was measured by drawing on and adapting questions from the SDLRS (Guglielmino, 1977) and the PRO-SDLS (Stockdale and Brockett, 2011). Prior studies have used SDLRS and PRO-SDLS to explore learner readiness – the attitudes, abilities, and motivation – to engage in a self-directed learning process (Guglielmino, 1977; Stockdale & Brockett, 2011). Characteristics, capabilities, and behaviours associated with SDL readiness, as indicated by the SDLRS and PRO-SDLS, include independence, confidence, persistence, initiative, creativity, critical (self-)evaluation, patience, self-efficacy, curiosity, and a desire to learn. Behaviours and maturity levels related to entrepreneurial traits of opportunity recognition and ideation, resource management and taking proactive action are drawn from the EntreComp framework (Bacigalupo *et al.*, 2016). The newly developed assessment framework compensates for the perceived shortcomings of the evaluated existing assessment tools to meet the requirements of this specific situation. The assessment frameworks in the SDL literature target predominantly adult learners and ask questions specifically focused on learning behaviour, whereas the intent of this research goes beyond that, instead trying to gain a deeper understanding of self-directed learning skills expressed in entrepreneurial actions, for which the EntreComp was used. The EntreComp framework is insufficiently related to learning behaviour and as such fell short for the purpose of this research, its specified behaviours, however, were integrated in the newly developed assessment framework for this study.

The design of the study, instrumentation and data analysis revolves around the conceptual framework for understanding the EE-SDLR relationship within the selected pool of participants. The EE-SDLR assessment framework consists of 22 questions, each providing 5 answering options that specify behaviours indicative of different mastery levels of autonomy, self-efficacy, or motivation. To proxy the change in

motivation, self-confidence and autonomy, respondents were asked to indicate the behaviours they believed were most representative to themselves at two different moments, Pre-Intervention (Appendix 1) and Post-Intervention EE (Appendix 2). From the SDLRS and PRO-SDLS, I have adopted seven 5-point Guttman scale questions related to learning style, goal setting, engaging in high-risk learning settings, and planning and managing learning tasks. The 5-point Guttman scale answer options were not presented ordinally, to prevent bias, which is common with Likert-scale questionnaires (Kuncel and Tellegen, 2009). The questions are presented in the sequence of the entrepreneurial process and EntreComp framework:

Questions 1, 2 (opportunity recognition/creation), 8, 9, 10 (resource management), are related to autonomous behaviour;

Questions 3, 4 (opportunity recognition/creation), 11, 12 (resource management), 19, (into action) and are related to motivation for learning and self-modification; and

Questions 5, 6, 7 (opportunity recognition/creation), 13 and 14 (resource management) are related to self-efficacy to undertake entrepreneurial activities.

Questions 15, 16, 17, 18, 20, 21 and 22 (into action) are all related to self-directed learning readiness.

For instruments to be considered robust in terms of internal consistency reliability, or item-relatedness, different standards are found in the literature. A frequently cited acceptable range of Cronbach's alpha is a value of 0.70 or above (Nunnally, 1978). Nunnally proposed the reliability cut-off to be set at 0.70 to be considered appropriate in the early stages of research when the scale is being developed. Hair *et al* (2006) proposed a lower cut-off at .6 for exploratory studies in social sciences, and McCall (1970) had set the standard acceptable level of significance in social science research at .5 level. With this doctoral research being part of social science, a score $>.6$ (sig. 2-tailed) would therefore be sufficient to be considered reliable.

Cronbach's alpha for the independent variables was .781 in the Post-Intervention (2021) survey, and 0.727 for the dependent variable. The Cronbach's alpha score for the independent variables was .682 in the pre-intervention survey, and .823 for the questions related to the dependent variable (see appendix 4).

Data was also collected for control variables and controlled for gender, study intention and career ambition. For example, I asked the respondents whether they intended to pursue a career in business management or entrepreneurship (self-

employment) or other. These control variables were coded as categorical or dummy variables.

3.4 Data analysis

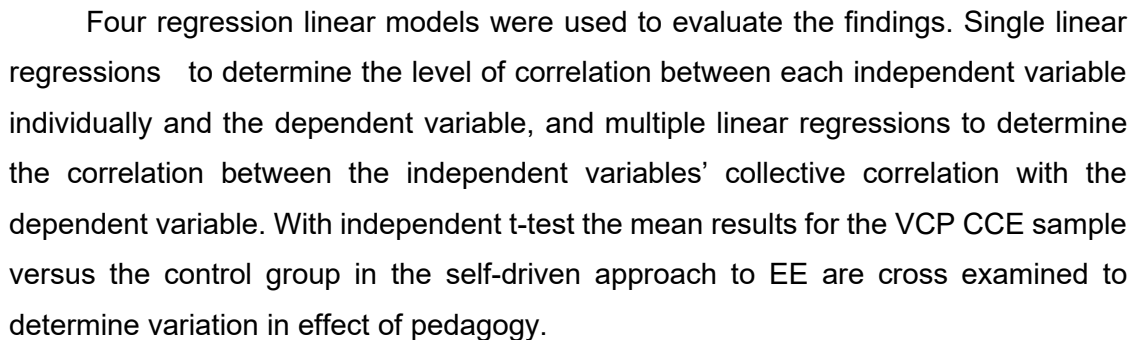
To test these propositions, or hypotheses, linear regression models were used. Statistical significance levels are reported at 5%, 1% and <0,1%. To determine correlation between variables and behavioural indicators, comparative analyses were conducted using bivariate correlation statistics, testing significance with t-tests. Template analysis was applied for the analysis of the qualitative data, using the operationalised constructs, as presented in the conceptual framework, as the main variables for coding. The collected descriptions and discussions of the participants' experiences have been further analysed through analytic deduction (AD). The AD was added to formulate explanations of the survey results about the moderating effects of the various pedagogical elements in the module and the students' report on the development of autonomy, self-efficacy, and motivation, with the intent to form a guiding principle to be extrapolated upon to predict new or similar experiences in various pedagogical approaches to learning. The quantitative and qualitative data sets were simultaneously analysed, followed with synthesis and integration in the interpretation phase. The process for data analysis is visualised in figure 12 (next page).

For the analysis of the quantitative data, factor analysis on the independent variables of learner characteristics and dependent variables of self-directed learning readiness was conducted. The varimax rotation factor analysis was used to extract the principal components and loaded into distinct constructs with values greater than 0.6. to meet the reliability threshold. I then used these factor structures as measures for the independent and dependent variables in the multiple regression analysis.

The descriptive statistics describe the basic features in the research, addressing the generalizability of the study as well as the volume and fit of the data collected for the models used. The demographic data collected was converted to numerical identifiers and entered into SPSS for analysis.

The second group of questions (Appendix I – Survey Questions) includes the modified EE-SDLR scale. All survey results were entered into SPSS and the individual questions for each factor were summed and averaged for a total factor score.

Focus Research Question:



- 1) How did the teaching learning process in the different modules affect the students self-efficacy and autonomous motivation to pursue new (self-directed) learning opportunities?
- 2) How did the students' experience with the social learning environment affect their self-efficacy and autonomous motivation to pursue new (self-directed) learning opportunities?

The qualitative data strand was analysed using template analysis. The rationale for this choice is two-fold: i) because of the methodological approach I chose for this research, grounding it in an existing theory (self-directed learning theory), and therefore applying its key factors as a-priori codes, and ii) because of the volume of the collected qualitative data, using a template would make the process of analysis manageable whilst securing its depth and rigour (King, 2004).

In the first step, data was reduced. The data selected for use was chosen based on its relevance for the study and organised by dividing it into coding units based on the similarity of themes. The initial themes used, or a-priori codes, were those presented in the conceptual framework. In the next step, coding units were further organized into a draft list of categories and sub-categories based on the conceptual framework (Sekaran & Bougie, 2016). This list was adjusted as new categories arose throughout the data analysis process. The data display comprises the presentation of selected quotes and graphs that present patterns and relationships among variables and categories. A single template was used to analyse the qualitative data strand to gain a deeper understanding of the two themes, Teaching-Learning Process and Social Learning Context. The template was a-priori coded (Figure 13, next page) with the key elements identified in the SDL literature and included in the research's conceptual framework (as was presented in figure 10, on page 83).

From the template analysis additional lower-order codes were generated and some of those initially presented in the conceptual framework modified or removed, as will be displayed in subsections 4.3.1-2 (Impact of the Teaching-Learning Process) and 4.3.3 (Impact of the Social Learning Context) of this chapter, which present the findings of the analysis.

Figure 13 Coding template analysis

Code

- 1. impact on autonomy, self-efficacy, motivation for self-directed learning
 - TLP: teaching learning process
 - SLC: social learning context
- TLP. Impact teaching learning process
 - CL. Contextualised teaching-learning
 - PG. Pedagogical Guidance
- TLP CL Impact Contextualised teaching learning
 - OWN Ownership & Responsibility
 - CON Consolidation & Integration
 - EXP Experiencing the effect of learning activity
 - EXP SUC Success - Failure
 - EXP STH Stakeholder collaboration & Feedback
- TLP PG Impact Pedagogical Guidance
 - PA. Pedagogical Approach
 - INS Instruction
 - FRD Freedom
 - ASS Assessment
 - FBG Feedback and Guidance
- SLC Impact of Social Learning Context
 - CA Classroom Arrangement
 - TD Team Dynamics
 - ROT Role of the Teacher
- SLC CA Impact of the Classroom Arrangement
 - COV. SARS-Cov-2 Lockdown
- SLC TD Team Dynamics
 - TRT Creating trust
 - TMT Team Management
 - EXP Managing Expectations
 - RAP Recognition and Appreciation
 - SLF Social Loafing

The data was transformed. In the last step of the data analysis, the drawing of conclusions, patterns are explained, and contrasts or comparisons are drawn (Sekaran & Bougie, 2016).

Figure 14 Data Analysis Process

Data analysis Quan-Qual					
QUANTITATIVE				QUALITATIVE	
Relationships between variables				Experiences Participants	
Intervention Effects	Statistical scores	Change	Mid Term Evaluation	Source	Positive Negative
Effect AUT/SE on Motivation				SMT (Students Mid Term Evaluation Survey) SET (Students End Term Evaluation Survey) SFG (Students Focus Group Interview) TCA (Teaching/Coaching Assistants Focus Group Interview) TC (Teacher/Coaches Focus Group Interview) CD (Course Director Face to Face Interview)	
IV AUT -> DV MOT	$r + p\text{-value}$	↕			
IV SE -> DV MOT	$r + p\text{-value}$				
	F				
	R^2				
	$R^2 \text{ Adj.}$				
Main effect EE					
AUTxSDLR	$r + p\text{-value}$	↕			
SExSDLR	$r + p\text{-value}$				
MOTxSDLR	$r + p\text{-value}$				
	F				
	R^2				
	$R^2 \text{ Adj.}$				
Interaction Effect Pedagogy					
EE-AUTxSDLR	$r + p\text{-value}$	↕			
EE-SExSDLR	$r + p\text{-value}$				
EE-MOTxSDLR	$r + p\text{-value}$				
	F				
	R^2				
	$R^2 \text{ Adj.}$				

3.5 Mixed Methods Validation

Onwuegbuzie and Johnson (2006, p.52) point to the ‘problem of integration’ in mixed methods research. They note that in the case of parallel mixed analysis, the researcher needs to ensure that the discussion of results derived from the two independent sets of quantitative and qualitative data, needs to show evidence of true integration, and avoid becoming two separate research reports. Researchers are advised to use one single data collection instrument and a ‘nesting’ sampling technique to ensure integration of methods used within a mixed research design. Evidence should be provided that the integration of all the data sets comments upon the same variables (Creswell and Plano-Clark, 2018, p.251). This advice was incorporated in the design and execution of my research, using the conceptual framework as the foundation for data collection and analysis and collecting explanatory qualitative data only from a selection of participants in the quantitative data collection sample. Merging the research findings in stage three, to draw interpretations in stage four (as was visualised in section 3.4) allowed me to gain the explanatory insights in the phenomena found, with the qualitative data building upon the quantitative data as it contains explanations provided by participants who took part in all phases of the research.

3.6 Ethical considerations

Research conducted by Northumbria University is subject to the institution's Principles of Good Research Practice and these are governed by ethical scrutiny and risk assessment carried out by independent Research Committees at Faculty level. The present doctoral study was granted ethical clearance prior to any data collection in accordance with the university's regulations (date: 01/06/2020).

On-line survey invitation by email in 2020

"This is a research project from the Amsterdam University of Applied Sciences (AUAS) and is related to doctoral research on entrepreneurship education. All data collected will be handled confidentially, stored securely, and used for the purpose of analysis for this study and the doctoral research. Data used in publications, conference presentations, workshops or in other public channels will be aggregated and anonymized."

The Interview invitation sent by email contained the following text:

'Your responses to the interview will remain confidential in accordance with the Northumbria University research ethics regulations and the UK Data Protection Act. If any publications are to be produced from the study, overall survey population findings will be presented without any reference to individual participants interviewed. To ensure accurate data collection, I ask your permission to audio-record the interview. Please find attached the research consent form'.

After data collection and transcription, the names of the participants and participating observers will be removed, and the voice recordings deleted.

All interviews, both in the diagnostic phase and the iterative exploration phase, will be recorded and transcribed. The transcripts' data will be systemically categorized, coded, summarized and stored in MAXQDA 12. All relevant materials, resulting from the various research activities, will be stored anonymized (with a unique encryption key) on Surfdrive (www.surfdrive.nl), in accessible, structured datasets for the duration of the research. After completion of the research, all data will be transferred to a product-database in DANS.

3.7 Summary

This chapter presented the research paradigm relevant for the scope of this doctoral study with the objective of justifying and explaining the methods chosen for data collection, data analysis and interpretation using a mixed methods research approach.

In the next chapter the findings from the two data strands (quantitative and qualitative) are presented in accordance with the analysis methods presented in this chapter.

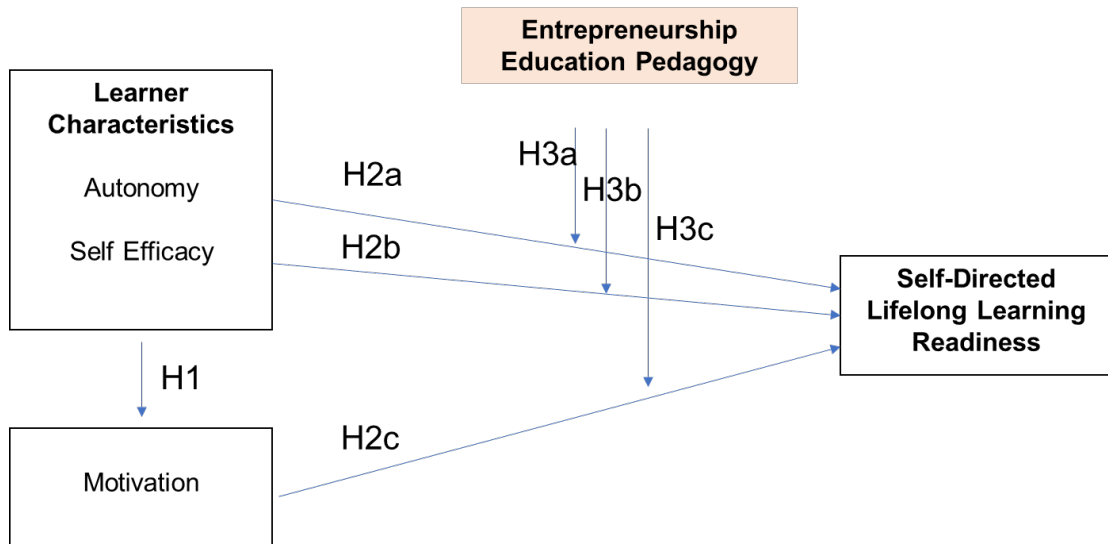
4 Findings of the Quantitative Data Analysis

The goal of the research was to answer the questions if, to what degree, how and why entrepreneurship education might contribute to preparing students for self-directed lifelong learning readiness. The '*how*' and '*why*' questions are of explanatory nature to the results of the '*if*' question. The quantitative data, therefore, was leading and is presented in this chapter. The purpose of the qualitative data collection and analysis is to bring a deeper or more thorough understanding of the phenomena found in the quantitative data analysis and therefore follows the quantitative analysis in chapter 5. This chapter is structured to present the results of the quantitative analysis per hypothesis.

- 1) Multiple regression analyses have been applied to test the hypothesis that an EE pedagogy positively influences SDLR, for which the following three questions have been individually assessed (Figure 15):
 1. To what degree do autonomy and self-efficacy interrelate with motivation?
 2. To what degree do autonomy (a), self-efficacy (b), and motivation (c) predict self-directed learning readiness?
 3. To what degree do pedagogical approaches to learning of EE moderate the autonomy, self-efficacy and motivation relation to self-directed learning readiness?
- 2) To measure the strength and direction of the linear relationships between the variables, the coefficients between the continuous level variables were tested for, using bivariate Pearson correlation analyses.
- 3) To determine variation in the degree and direction of the impact that EE pedagogy had on students' self-reported levels of autonomy, self-efficacy, motivation, and self-directed learning readiness, and to determine the sustainability of that impact, the t-test method was used to compare the means for each of the correlations tested between the three sequentially collected data sets, and between the two pedagogical formats of EE evaluated in this research.

The data for the statistical tests to confirm or nullify the propositions was obtained from student self-assessment questionnaires from 3 different student groups, representing different EE modules taught at AMSIB, across three subsequent moments in time.

Figure 15 Propositions tested in quantitative research



As was presented in chapter 3, the main intervention studied for this research is the stage-wise mixed-pedagogical approach to EE as applied in the venture creation project Co-creative entrepreneurship (VCP CCE). The other EE modules included in this study apply a self-driven pedagogical approach to EE, either in a scale-up simulation or in a real-life business consultancy setting. These two self-driven modules have been listed together as control group. Data from participants in the 2021 VCP CCE was coded 0; data from self-driven modules in 2021 was coded 1.

Introduction

The chapter begins with the confirmation that the various EE modules studied in this research both have had a significant impact on students' self-directed learning readiness. The results from the quantitative data analysis that led to the above conclusion are presented in the following sections of this chapter.

Prior to testing the relationship between the independent and dependent variables, the predictive value of the control variables – gender, study intention and career ambition– on the dependent variables motivation and self-directed learning readiness was assessed (section 4.2.1).

Sections 4.2.2 presents the findings on the effect of autonomy and of self-efficacy on motivation, and how this is influenced by participation in the studied EE modules (4.2.3). Section 4.2.4 presents the analyses of the relationship between the independent variables (autonomy, self-efficacy, and motivation) and self-directed learning readiness, measuring their predictive value. Section 4.2.5 compares the

results of the pre- and post-intervention surveys to determine the influence of the EE programmes in general on the predictive value of the independent variables for self-directed learning readiness. In section 4.2.6 the two samples representative of the two pedagogical approaches are evaluated and compared to determine and explain the varying moderating effect of the different pedagogical approaches to entrepreneurship education.

Because this research was conducted under the unique circumstances of the SARS-Cov-2 enforced lockdown of society, its effect on the results has been controlled for separately. These results are presented in section 4.2.7. The chapter is concluded with a summary of the findings (4.2.8).

4.1 Demographics: Participating survey respondents

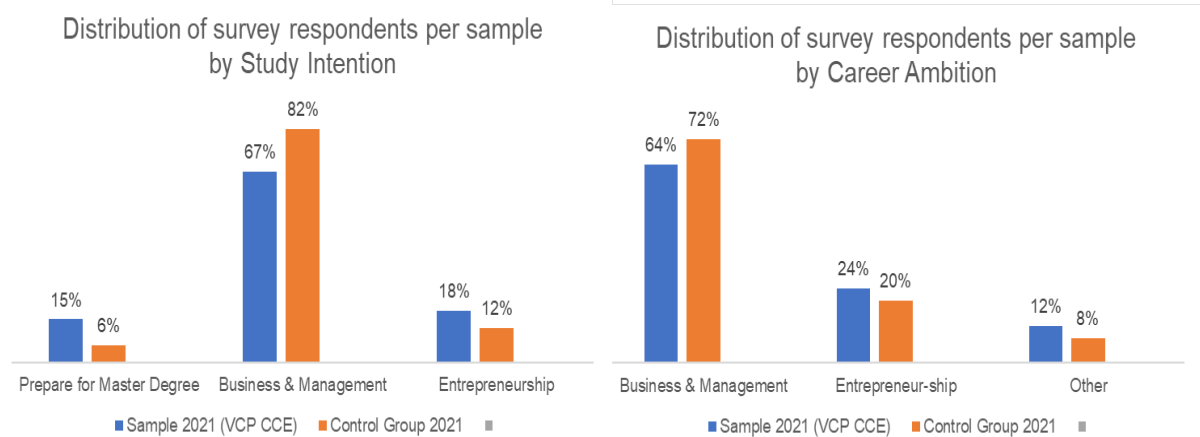
This section presents an overview of the sample population that responded to the various surveys that have been conducted to gather quantitative data. The collected data was analysed using SPSS.

4.1.1 Survey samples

The initial analysis consists of the control variables of the surveys: gender, study intention, career ambition. The research controlled for a variety of individual characteristics to rule them out as alternative explanations of the variation in self-directed learning readiness. These included study intention and career ambition (Figure 16) and gender (Figure 17).

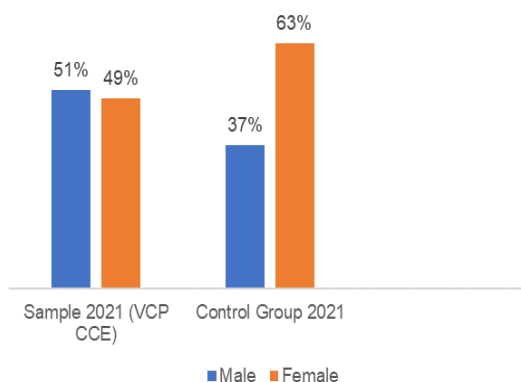
When examining the demographic data of the surveyed students, the distribution of student ambitions is skewed towards a career in business and management, both in terms of study intention and career ambition. Approx. 72% of the students studying IB at AMSIB indicate their preference for business over entrepreneurship (approx. 18%).

Figure 16 Study Intention & career ambition of survey respondents



The programme's focus on International Business may explain the variation in study and career ambition. Most students (on average approx. 70%) chose to study IB at AMSIB to prepare for employment in a business management position within an existing firm versus an average of approx. 20% who wishes to prepare for starting a company themselves. One in 10 students enrolled in the AMSIB IB programme as a steppingstone towards a master's degree because that the Dutch higher educational system does not permit graduates from higher generic advanced education (HAVO) or vocational education at level 4 (MBO) to be admitted to the science universities. A propaedeutic diploma from a higher vocational study (HBO), or university of applied science does qualify for admission.

Figure 17 Gender distribution of survey participants



Variation between male and female students (Figure 17) is equal in the main sample (2021 VCP CCE) that represents the mixed-pedagogy approach to EE. More variation is seen across the control group (37% being male and 63% female students).

4.2 Gender, Study intention and Career Intention

To test if the control variables – gender, study intention and career ambition – significantly predict motivation or self-directed learning readiness, multiple linear regression analyses were used (Tables 16 and 17).

The regression equation in table 16 demonstrates that none of the control variables were found to significantly predict motivation. Neither in the pre-intervention phase (R^2 .001, $F(3,392)= .168$, $p = .92$), nor in the post-intervention phase (R^2 .007, $F(3,247)= .59$, $p = .62$).

Table 16 Results of Multiple Linear Regression analysis for Motivation

Results of Regression analysis for Motivation		
Variables	Model 1	
Control Variables	Pre Intervention	Post
Gender	-.017	.009
Study Intention	.005	.094
Career Ambition	-.033	-.029
<i>F</i> value	.168	.59
R^2	.001	.007 ^a
Adjusted R^2	-.006	-.005
a. Predictor: (Constant) Career Ambition, Study Intention, Gender Gender coded as 0=male, 1=female *** $p < .001$; ** $p < .01$; * $p < .05$		
Dependent variable is Motivation		

The multiple linear regression used to test the control variables' predictive value for self-directed learning readiness also demonstrates that gender, study intention and career ambition did not significantly predict self-directed learning readiness (Table 17) prior to participation in the EE modules (R^2 .007, $F(3,401)= .886$, $p = .45$). This had changed upon completion of the modules. It was found that post-intervention the control variables did significantly predict self-directed learning readiness. The overall regression was statistically significant (R^2 .033, $F(3,248)= 2.84$, $p < .05$).

Table 17 Results of Multiple Linear Regression analysis for SDLR

Variables	Model 1	
Control Variables	Pre Intervention	Post Intervention
Gender	-.065	-.051
Study Intention	-.037	.062
Career Ambition	.055	.129
F value	.886	2,84*
R2	.007 ^a	.033 ^a
Adjusted R2	-.001	.022

a. Predictor: (Constant) Career Ambition, Gender, Study Intention

Gender coded as 0=male, 1=female

*** $p < .001$; ** $p < .01$; * $p < .05$

Dependent variable is Self-Directed Learning Readiness

4.3 Predictive value of Autonomy and Self-Efficacy for Motivation

The first hypothesis raised from the literature review and tested in the research sample was that autonomy and self-efficacy predict motivation for the learning module. To test this hypothesis, multiple linear regression was used. The results in table 18 illustrate that prior to participating in EE, neither autonomy nor self-efficacy significantly predicted participants' motivation for learning in the EE modules, but that this was positively influenced by the EE interventions. It was found that the predictive value of autonomy was enhanced from a non-significant ($\beta = .001$, $p = .98$) pre-intervention, to a statistically significant ($\beta = -.193$, $p = .001$) predictive value for motivation post-intervention. The predictive value of self-efficacy too was influenced by the EE intervention. Prior to the module self-efficacy was found not to significantly predict motivation ($\beta = .004$, $p = .94$), but the post-intervention results revealed it having become significantly predictive for motivation ($\beta = .303$, $p < .001$). The overall regression was not statistically significant pre-intervention ($R^2 .001$, $F(3,392) = .102$, $p = .10$), but has become statistically significant post intervention ($R^2 .129$, $F(5,245) = 7.26$, $p < .001$). The results of the pre-intervention seem to nullify the hypothesis that autonomy and self-efficacy predict motivation, however, upon completion of the entrepreneurship education module, when students have become familiar with the learning activities, autonomy and self-efficacy have become predictive of motivation, confirming the hypothesis (H1).

Table 18 Predictive value of autonomy and self-efficacy for motivation

Variables	Model 1		Model 2	
Control Variables	Pre Intervention	Post	Pre Intervention	Post
Gender	-.017	.009	-.018	.041
Study Intention	.005	.094	.005	.061
Career Ambition	-.033	-.029	-.034	-.005
Main effects on Motivation				
Autonomy			.001	-.193**
Self Efficacy			.004	.303***
<i>F</i> value	.168	.59	.102	7.26***
<i>R</i> ²	.001	.007 ^a	.001 ^b	.129 ^c
Adjusted <i>R</i> ²	-.006	-.005	-.012	.111

a. Predictor: (Constant) Career Ambition, Study Intention, Gender

b. Predictor: (Constant) IV_AUT

c. Predictor: (Constant) IV_AUT, IV_SE

Gender coded as 0=male, 1=female

****p* < .001; ***p* < .01; **p* < .05

Dependent variable is Motivation

4.3.1 Impact of EE on predictive value of autonomy and self-efficacy for motivation

Having established the predictive value of autonomy and self-efficacy for motivation for learning in entrepreneurship education, I thought it necessary to include an evaluation of the impact that the two different approaches to EE studied (the stage-wise, multi-pedagogy approach recommended by the self-directed learning literature, and the increasingly popular self-steering pedagogy) have on the predictive value of autonomy and self-efficacy for (study) motivation. For this additional multiple linear regression was used.

Table 19 Impact Pedagogical Approaches

Results of Regression analysis for Motivation								
Variables	Model 1		Model 2		Model 3			
Control Variables	Pre Intervention	Post Intervention	Pre Intervention	Post Intervention	MainSample Pre Intervention	Post Intervention	Control Group Pre Intervention	Post Intervention
Gender	-.017	.009	-.018	.041	.028	-.016	-.133	.137
Study Intention	.005	.094	.005	.061	.003	.077	-.083	.031
Career Ambition	-.033	-.029	-.034	-.005	.002	-.010	-.100	-.078
Main effects on Motivation								
Autonomy			.001	-.193**	-.048	.123	.115	.009
Self Efficacy			.004	.303***	.090	.286***	-.100	.324**
F value	.168	.59	.102	7.26***	.60	4.55***	1.55	1.68
R ²	.001	.007 ^a	.001 ^b	.129 ^c	-.010	.114	.073	.089 ^c
Adjusted R ²	-.006	-.005	-.012	.111	-.007	.119	.026	.048

a. Predictor: (Constant) Career Ambition, Study Intention, Gender

b. Predictor: (Constant) IV_AUT

c. Predictor: (Constant) IV_AUT, IV_SE

Gender coded as 0=male, 1=female

*** $p < .001$; ** $p < .01$; * $p < .05$

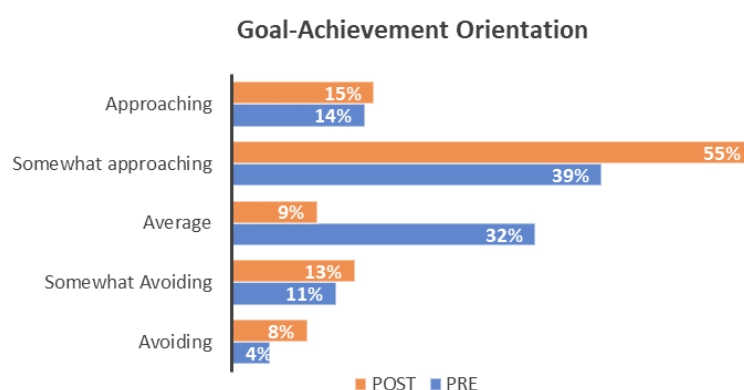
Dependent variable is Motivation

The results presented in table 19 suggest varying effects between a stage-wise, mixed pedagogical approach and the self-steering approach to EE when it comes to the predictive value of autonomy and self-efficacy for motivation. The predictive value of autonomy remained not statistically significant between the pre-intervention (β -.048, $p = .42$ in the main sample and β .115, $p = .25$ in the control group) and the post-intervention phase (β .123, $p = .09$ in the main sample and β .009, $p = .94$ in the control group). The predictive value of self-efficacy for motivation did increase from being non-significant prior to participation in each sample group ($\beta = .090$, $p = .13$ in the stage-wise, mixed pedagogy approach and $\beta = -.100$, $p = .37$ in the self-steering approach) to being statistically significant post-intervention ($\beta = .286$, $p < .001$ in the stage-wise, mixed pedagogy approach and $\beta = .324$, $p < .05$ in the self-steering approach). The overall regression, however, was only statistically significant post-intervention (R^2 .114, $F(5,117) = 4.55$, $p < .001$) for the main sample, confirming the hypothesis that self-efficacy predicts motivation (H1b), but nullifying the hypothesis that autonomy predicts motivation for learning (H1a). Because the overall regression for the results of the control group remained not significant post-intervention (R^2 .089, $F(5,62) = 1.68$, $p = .15$), it seems that pedagogical approach makes a difference. This will be further researched in the following sub-sections.

To get a better understanding of the predictive value of self-efficacy for motivation for learning, the results of individual survey questions were analysed. Figure 18 illustrates the results of the survey question that represented how students deal with

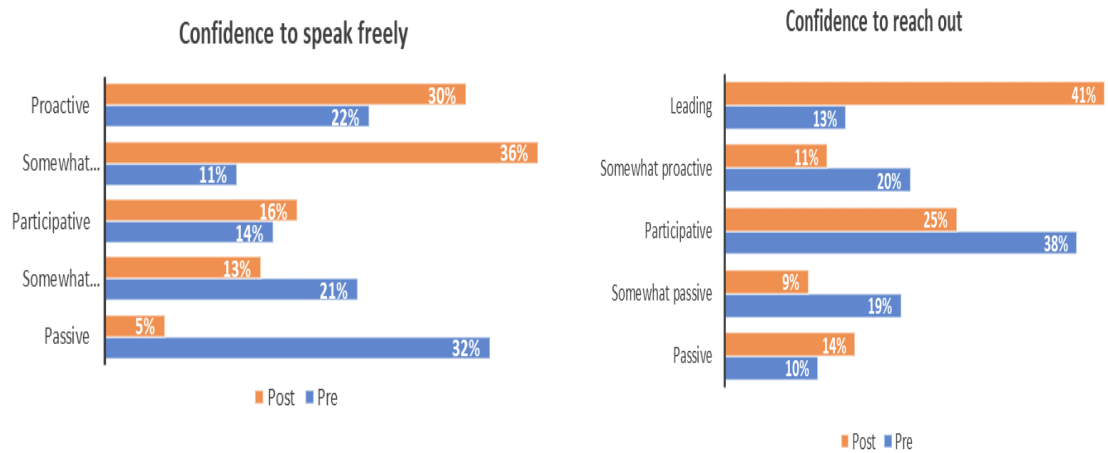
challenging goals (Q12-Pre and Q19-Post). The behavioural indicators provided in the answering options have been proxied against the characteristics of the expectancy-value theory of achievement motivation, which the literature identifies as being indicative of the tie between self-efficacy and motivation. The results, as shown in figure 18, illustrate an increase in students' tendency to approach (from 53% to 70%) challenging learning goals, but also a slight increase in students' tendency to avoid (from 15% to 21%) such learning challenges. Another interesting observation to be made is the substantial decrease in students 'sitting on the fence' (average score). Prior to participating in EE 32% of the students scored average, against just 9% upon completion of the EE modules. These results seem to confirm the importance of confrontation with learning needs in a contextual setting (Robinson et al., 2016; De La Harpe and Radloff, 2010) and how this affected the self-efficacy x motivation relationship (17% scoring higher against 6% scoring lower than average).

Figure 18 Achievement motivation – Approaching vs Avoiding Challenging Goals



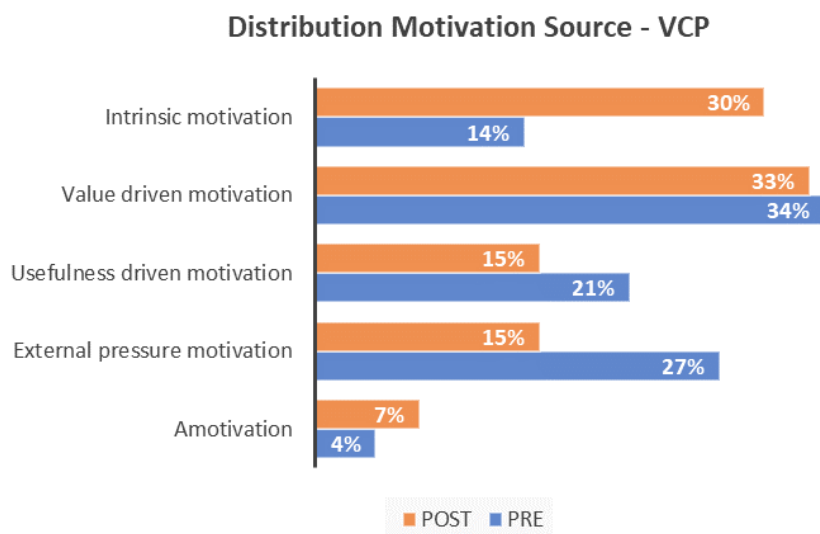
To further analyse the development of motivation, the students' self-administered behaviour reflective of their main source of motivation (internal-external) Q12-Post versus Q10-Pre) was proxied against the motivation types specified in the literature (Deci & Ryan, 2000). Figure 19 illustrates a changing distribution variance between intrinsic motivation (from 14% to 30%), internalised motivation (from 55% to 48%) and extrinsic motivation (31% to 22%) in favour of intrinsic motivation. These results suggest that participation in the EE modules has had a positive influence on students' interest in and enthusiasm for learning within and beyond the EE module, which will be further analysed in subchapter 4.2.4.

Figure 19 Confidence to speak up and reach out



To get a better understanding of the increased correlation between self-efficacy and motivation, survey questions 4 (proactive engagement) and 6 (sharing opinions and ideas) were analysed as these may be interpreted as self-administered confidence to express themselves in the creation- and the execution phase. The results illustrated in figure 20 show an increase in students' propensity to act more proactive (from 33% to 66%) and take a more leading role (from 13 to 41%), both of which suggest an increase in perceived self-efficacy.

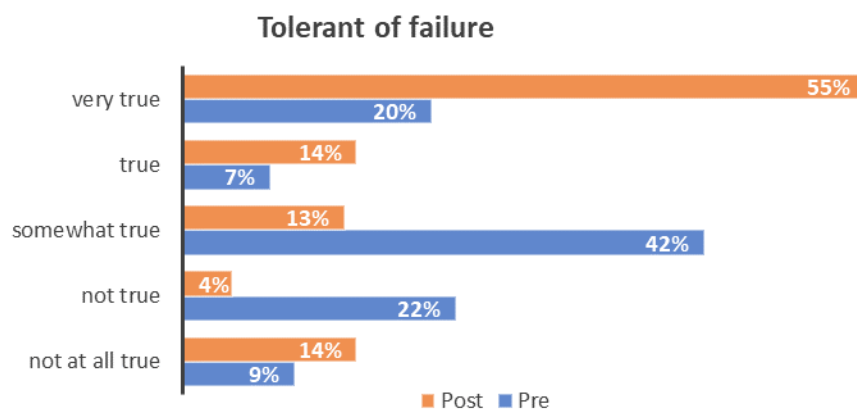
Figure 20 Source of Motivation



According to the literature, increased confidence would also be expressed in increased risk propensity, and therefore higher tolerance of failure. This was evaluated in the survey with question 7, the frequency distribution of which indicates how students

deal with rejection, which may be interpreted as an indication of their tolerance of failure. On this element too, the data analysis reveals a substantial increase in favour of self-efficacy, with the tolerance levels to failure rising from 27% pre-intervention to 69% post-intervention. Figure 21 illustrates that 42% of the students may have not been able to determine if they were failure tolerant prior to participation in the module (scoring neither true nor untrue). Seeing how this number decreased to a mere 13% upon completion of the modules might suggest that they have gained confidence, but it may also suggest that they learned that failure had a different meaning in the EE modules than they had previously expected. This has not been researched further though.

Figure 21 Tolerance of Failure



Relating the results in figures 20 and 21 to those in figure 18 substantiates the results of a positive impact of EE on self-efficacy and motivation, contributing to its enhanced predictive value for motivation, as was found in the multiple regression analysis.

4.4 Relating Autonomy, self-efficacy, and motivation to SDLR

The main proposition brought forward by the review of the self-directed learning literature is that maturity levels of learner characteristics are related to maturity levels of self-directed learning readiness. To validate this proposition, multiple and simple linear regression analyses have been performed. The relationship was tested both collectively (all independent variables and control variables combined) and individually (each independent variable separately) to determine if and to what degree autonomy (a), self-efficacy (b), and motivation (c) predict self-directed learning readiness (H2). Evaluating both datasets, from the pre-intervention and the post-intervention phase allowed to detect if and to what degree the predictive value of the independent variables is influenced by entrepreneurship education pedagogy (H3). The results of the latter will be elaborated on in section 4.5 though. This section focuses on quantifying the autonomy, self-efficacy, and motivation relation to self-directed learning readiness.

Table 20 Multiple Linear Regression - Model 1 + 2 Predictive values of IVs for SDLR

Variables	Model 1		Model 2	
			Samples Combined	
Control Variables	Pre Intervention	Post	Pre Intervention	Post
Gender	-.065	-.051	-.069	-.028
Study Intention	-.037	.062	-.022	-.028
Career Ambition	.055	.129	.049	.144**
Main effects on Self-Directed Learning Readiness				
Autonomy			.092*	.258***
Self Efficacy			.199***	.628***
Motivation			.396***	.188***
F value	.886	2,84*	16.97	62.67***
R2	.007 ^a	.033 ^a	.210 ^b	.610 ^c
Adjusted R2	-.001	.022	.197	.601

a. Predictor: (Constant) Career Ambition, Gender, Study Intention

b. Predictor: (Constant), A_IV_MOT, A_IV_AUT, A_IV_SE, Study Intention, Gender, Career Ambition

c. Predictor: (Constant), P_IV_MOT, Career Ambition, P_IV_AUT, Gender, P_IV_SE, Study Intention

Gender coded as 0=male, 1=female

*** $p < .001$; ** $p < .01$; * $p < .05$

The results of the multiple linear regression analysis (Table 20), illustrate that, prior to and upon completion of the EE modules, all three of the independent variables are significantly predictive for self-directed learning readiness. The fitted regression model for self-directed learning readiness, as illustrated in table 20, is: $SDLR = .092^* (\text{autonomy}) + .199^{***} (\text{self-efficacy}) + .396^{***} (\text{motivation})$ at the start of the intervention (pre-intervention) versus $SDLR = .258^{***} (\text{autonomy}) + .628^{***} (\text{self-efficacy}) + .188^{***} (\text{motivation})$ upon completion of the EE modules (post-intervention). These results suggest that the relationship between autonomy and self-directed learning readiness, and that between self-efficacy and self-directed learning intensified, that of motivation and self-directed learning readiness decreased. In the following section this observation will be analysed in more depth.

4.5 Moderating influence of EE on SDLR

The results of the multiple linear regression analysis revealed a noticeable difference in coefficients of self-efficacy (Table 20) between pre- and post-intervention (from $\beta = .199, p < .001$ pre- to $\beta = .628, p < .001$ post-intervention) and the tripling of the predictive value of autonomy for self-directed learning readiness (from $\beta = .092, p = .04$ pre- to $\beta = .258, p < .001$ post-intervention). The results thus suggest that participating in entrepreneurship education does indeed enhance the predictive value of these learner characteristics for self-directed learning readiness. Noticeable too, however, is the decrease (>50%) of the predictive value of motivation (from $\beta = .396, p < .001$ pre- to $\beta = .188, p < .001$ post-intervention), even though its predictive value remains statistically significant. Assuming the combination of the independent variables and inclusion of the control variable could have led to a distorted outcome of the results, I decided to add simple linear regressions to test the predictiveness of each independent variable for self-directed learning readiness, both pre- and post-intervention.

The results of the simple linear regression (Table 21) show that each independent variable has gained effect on self-directed learning readiness, including that of motivation for self-directed learning ($\beta = .396, p < .001$ pre- versus $\beta = .406, p < .001$ post-intervention). The predictive value of self-efficacy ($\beta = .196, p < .001$ pre- versus $\beta = .694, p < .001$ post-intervention) in the simple linear regressions is similar to those obtained in the multiple regression analysis. Autonomy gained predictive value for self-directed learning from not significant before the EE intervention ($\beta = .087, p = .09$) to significant upon its completion ($\beta = .294, p < .001$).

Table 21 Simple Linear Regression Results - Both Samples Combined

Simple Linear Regression Results IV x DV SDLR					
All Samples	Predictor	β	F	R ² Adj	t
Pre	Autonomy ^a	.087	2,98	.005	1,73
Post		.294***	23,18***	.083	4,19
Pre	Self Efficacy ^b	.196***	15,52***	.036	3,94
Post		.694***	227,32***	.479	15,08
Pre	Motivation ^c	.396***	72,39***	.155	8,51
Post		.406***	48,35***	.161	6,95

a. Pre-Intervention Predictor: (Constant), A_IV_AUT
 b. Post-Intervention Predictor: (Constant), P_IV_AUT
 c. Pre-Intervention Predictor: (Constant), A_IV_SE
 d. Post-Intervention Predictor: (Constant), P_IV_SE
 e. Pre-Intervention Predictor: (Constant), A_IV_MOT
 f. Post-Intervention Predictor: (Constant), P_IV_MOT

*** $p < .001$, ** $p < .01$, * $p < .05$

Dependent variable is Self-Directed Learning Readiness

Fitted Models Simple Linear Regression

	PRE INTERVENTION	POST INTERVENTION
AUT	SDLR = -.003 + .107(autonomy), $p = .09$	SDLR = -.038 + .315***(autonomy), $p < .001$
SE	SDLR = -.002 + .195*** (self-efficacy), $p < .001$	SDLR = .064 + .941*** (self-efficacy), $p < .001$
MOT	SDLR = .003 + .484*** (motivation), $p < .001$	SDLR = -.400 + .884*** (motivation), $p < .001$

Overall regression results from Simple Linear Regression

	PRE INTERVENTION	POST INTERVENTION
AUT	R^2 .008, $F(1,389)$ 2,98, $p = .09$	R^2 .086, $F(1,245)$ 23,18, $p < .001$
SE	R^2 .038, $F(1,389)$ 15,52, $p < .001$	R^2 .481, $F(1,245)$ 227,32, $p < .001$
MOT	R^2 .152, $F(1,389)$ 72,39, $p < .001$	R^2 .165, $F(1,245)$ 48,35, $p < .001$

The results of the simple- and the multiple linear regression analyses, pre- and post-intervention, provide statistically significant support for the hypothesis that the predictive value of the learner characteristics (IVs) for SDLR is enhanced by entrepreneurship education pedagogy (H3). It does not yet give insight in possible variance between the different pedagogical approaches though. The following subsection will analyse the latter in more detail, testing if significance variance exists between the different pedagogical approaches.

To determine to what degree changes in perceived levels of autonomy, self-efficacy, motivation, and self-directed learning readiness affected behaviours of the students, the coefficients for the variables were correlated with maturity levels of behavioural indicators.

Table 22 Correlation between Self-Efficacy and indicators of study behaviour

Self-Efficacy x Enthusiasm for the module	$r = .602 \ p < .001$
Self-Efficacy x Dealing with the Lockdown	$r = .613 \ p < .001$
Self-Efficacy x Sharing opinions and ideas	$r = .538 \ p < .001$
Self-Efficacy x Reaching out to stakeholders	$r = .750 \ p < .001$
Self-Efficacy x Leadership in Team Role	$r = .607 \ p < .001$
Self-Efficacy x Dealing with ambiguity	$r = .536 \ p < .001$
Self-Efficacy x Independence and motivation in tasks	$r = .586 \ p < .001$
Self-Efficacy x Approaching new learning challenges	$r = .510 \ p < .001$

The results of the bivariate Pearson Correlation test (Table 22) show strong correlations ($>.70$) between self-efficacy and students becoming aware of learning needs, their willingness to exploit new learning opportunities, their confidence to approach high risk learning tasks and their intention to do something similar in the future. These correlations indicate that the higher the levels of self-efficacy, the more students become aware of their learning needs and are more inclined to take proactive, self-directed action to achieve learning goals. The results also indicate that the higher the levels of self-efficacy, the more they are motivated to engage in learning activities similar to those applied in the entrepreneurship education module. Self-efficacy has a moderate correlation ($>.50$) with motivation and type of motivation, suggesting that as self-efficacy increases, motivation becomes more intrinsic, and students dare to take more risks to learn.

Table 23 Correlations between Autonomy with study behaviour

Autonomy x Dealing with rejection	$r = .619 \ p < .001$
Autonomy x Reaching out to stakeholders	$r = .583 \ p < .001$
Autonomy x Resourcefulness to obtain resources	$r = .644 \ p < .001$

The results illustrated in table 23 reveal a moderately strong correlation ($>.50$) between autonomy and students' ability to deal with rejection and their willingness to reach out to stakeholders, indicating that the higher the level of autonomy, the more the students dare to reach out to strangers to obtain the necessary information and resources, regardless the chance they get rejected.

The results found that motivation is moderately correlated ($r = .619^{**}$, $p < .001$) with how students deal with ambiguity.

Table 24 Correlations Self-Directed Learning Readiness with study behaviour

SDLR x Self-Efficacy	$r = .694$ $p < .001$
SDLR x Enthusiasm for the module	$r = .543$ $p < .001$
SDLR x Reaching out to succeed	$r = .552$ $p < .001$
SDLR x Leadership in Team Role	$r = .667$ $p < .001$
SDLR x Identifying learning needs	$r = .719$ $p < .001$
SDLR x Dealing with ambiguity	$r = .722$ $p < .001$
SDLR x Motivation within and beyond ILOs	$r = .555$ $p < .001$
SDLR x Independence and motivation in tasks	$r = .828$ $p < .001$
SDLR x Approaching new learning challenges	$r = .683$ $p < .001$

Finally, table 24 shows that self-directed learning readiness is strongly correlated ($>.70$) with identifying learning needs, dealing with ambiguity and autonomous motivation, which corresponds with the findings from the SDL literature. The higher a person's level of SDLR, the higher the chances that he/she will be able to recognize learning needs and proactively take control over learning tasks, regardless the risk of failure this may represent.

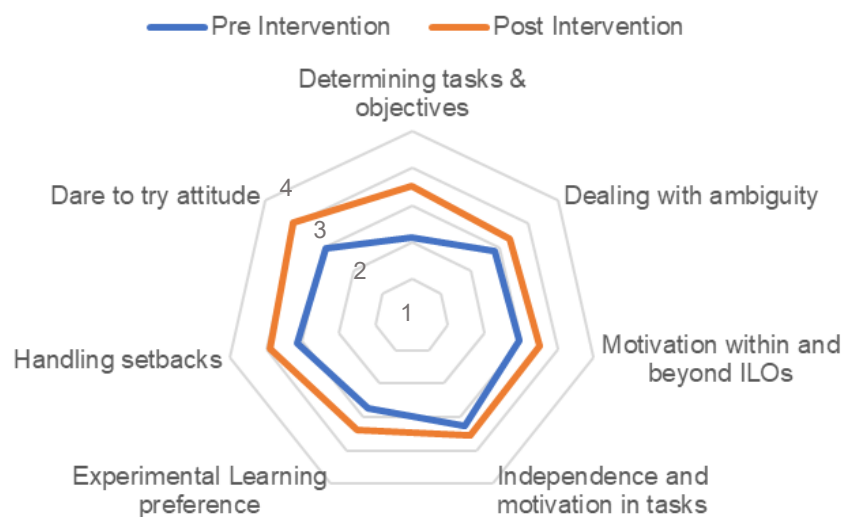
The results reveal a moderately strong correlation between SDLR and self-efficacy; between the role a student takes in a team and his/her attitude towards learning challenges (approaching versus avoiding) within and beyond the requirements of the course. The results also suggest a strong correlation between SDLR and students' willingness to reach out to stakeholders.

The results from the bivariate correlation analyses and the regression analyses seem to confirm the propositions made in the conceptual framework of this research, *that* entrepreneurship education influences students' learning behaviour reflective of autonomy, self-efficacy, and motivation. They also seem to confirm the relationship of these behaviours with maturity levels of self-directed learning readiness, but they do not show if the effect has been positive or negative. To be able to answer the question if and to what degree EE enhanced the students' perceived maturity levels of autonomy, self-efficacy, and motivation for self-directed learning, I have compared the means of each of behavioural indicators as presented in the self-assessment survey questionnaires pre-intervention and post-intervention.

The means comparison of the two surveys provides the evidence that EE has indeed had a positive impact, not only on the relationship between the variables, but also on the skills related to self-directed learning readiness. Figure 22 illustrates the students' enhanced ability and willingness to identify learning needs, to approach instead of avoiding the learning activities in EE and persist when things don't go as they had planned.

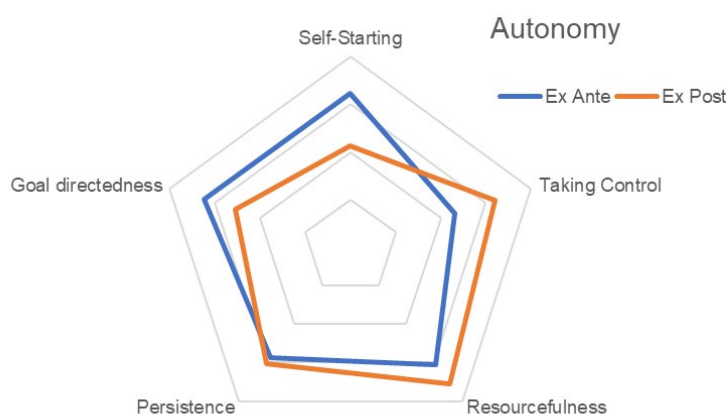
Figure 22 Comparison of Means for SDLR Pre- vs Post-EE

Impact of Entrepreneurship Education on Self-Directed Learning Readiness



Comparing the means values of the behavioural indicators that represent the different constructs are not as equally divided as those in the SDLR comparison and can therefore give a more comprehensive indication of the impact EE has had on the students' perceived maturity levels of autonomy, self-efficacy, and motivation for the learning challenges in the EE modules.

Figure 23 Comparison of Means for Autonomy Pre- vs Post EE



The mean values of the indicators for learner autonomy (Figure 23) show that the overall perceived willingness and/or ability to self-start their learning activities has decreased, as did the students' goal-directedness. Against the perceived enhancement of the SDLR characteristics, these results might suggest that for students to feel willing and able to take control over their learning and persist to achieve their learning results, they have become more dependent on external support.

This apparent increase in need for support seems to be confirmed when comparing the means results of the indicators that reflect self-efficacy (Figure 24, next page) and motivation (Figure 25, next page). These show an overall decrease in enthusiasm and effort for the learning activities, a decreased persistency, and a decrease in willingness to take independent decisions and action.

In conclusion, these means comparisons show that EE has enhanced the self-directed learning readiness of the participants, but that it has had a varying (positive and negative) impact on the different behaviours that reflect maturity of autonomy, self-efficacy, and motivation.

Figure 24 Comparison of Means for Self-Efficacy Pre- vs Post EE

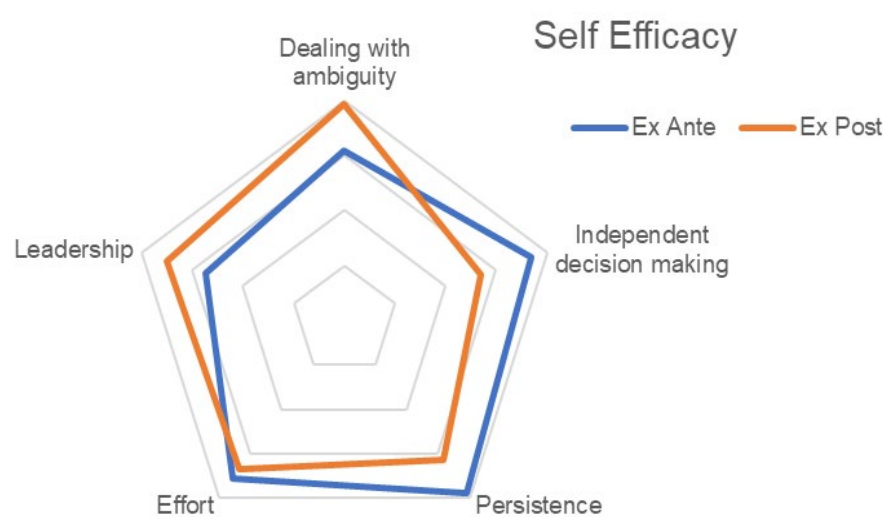
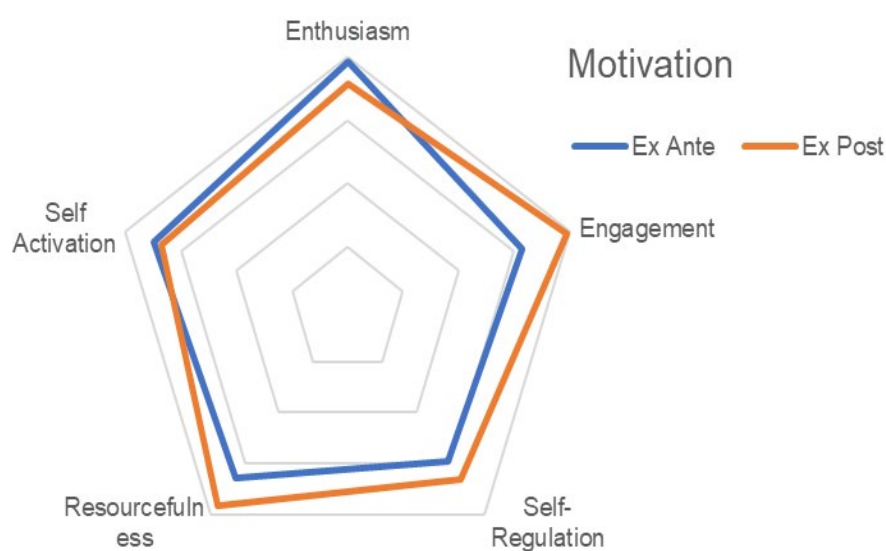


Figure 25 Comparison of Means for Motivation Pre- vs Post EE



4.6 Impact of different Pedagogical Approaches

The research hypothesised that a mixed pedagogical approach to EE would result in a more substantial impact than the single, self-steering pedagogical approach to EE would. To test this hypothesis, the multiple- and simple linear regression analysis were repeated, making a distinction between the two different sample groups. The aim of the regression analyses was to determine if the trend found in model 2 is generic for both sample groups, or if impact varied between the samples.

Table 25 Impact EE Pedagogy on Self-Directed Learning Readiness

Results of Multiple Linear Regression for SDLR

Variables	Model 3			
	MainSample		Control Group	
Control Variables	Pre Intervention	Post Intervention	Pre Intervention	Post Intervention
Gender	.014	.012	-.360	-.104
Study Intention	-.022	-.035	-.017	-.007
Career Ambition	.039	.142*	.031	.129
Main effects on Self-Directed Learning Readiness				
Autonomy	.060	.297***	.202*	.225**
Self Efficacy	.203***	.593***	.334***	.650***
Motivation	.386***	.188***	.361***	.232**
F value	12.40***	45.08***	7.20	18.04***
R2	.210 ^d	.609 ^d	.308 ^b	.647 ^e
Adjusted R2	.193	.595	.265	.611

b. Predictor: (Constant), A_IV_MOT, A_IV_AUT, A_IV_SE, Study Intention, Gender, Career Ambition

d. Predictor: (Constant) P_IV_MOT, Career Ambition, Gender, P_IV_AUT, Gender, P_IV_SE

e. Predictor: (Constant), P_IV_MOT, Study Intention, P_IV_AUT, Gender, P_IV_SE, Career Ambition

Gender coded as 0=male, 1=female

*** $p < .001$; ** $p < .01$; * $p < .05$

Dependent variable is Self-Directed Learning Readiness

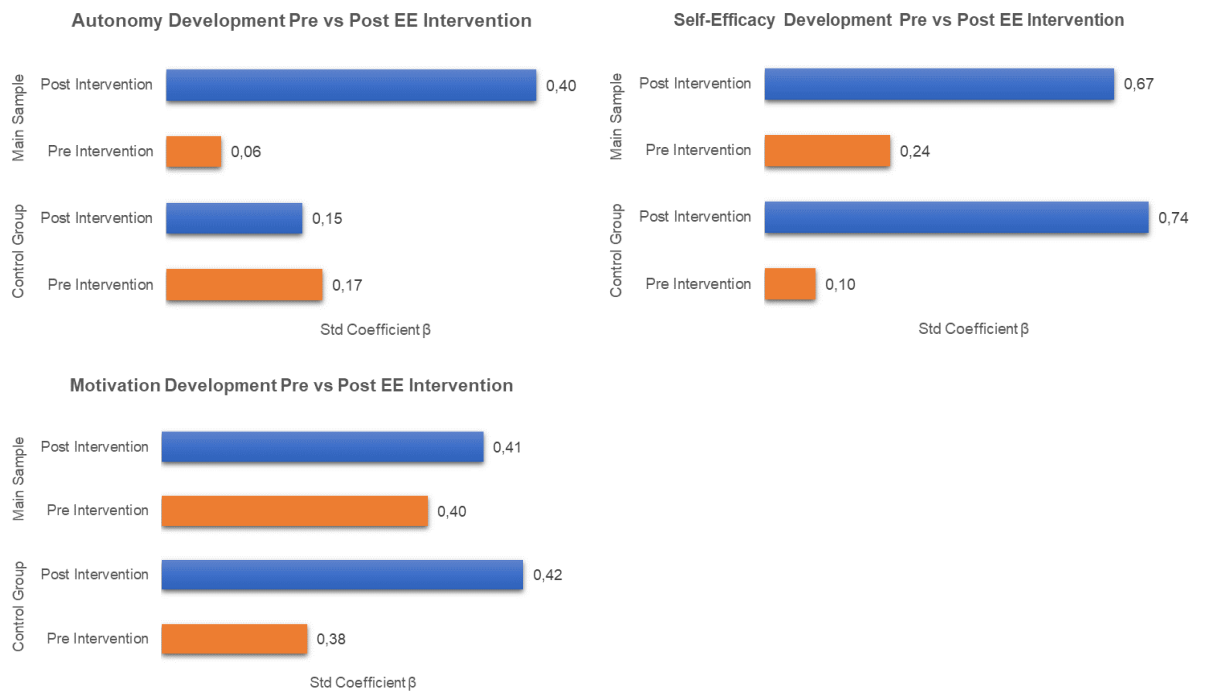
The results in model 3 (Table 25) illustrate a similar increase in the overall predictive value of the learner characteristics for self-directed learning readiness in both sample groups and that this increase is driven predominantly by the enhancement of self-efficacy for self-directed learning readiness. More variance is found between the samples in the development of autonomy and motivation in terms of their relation to self-directed learning readiness. The multiple linear regression analysis of the two different samples also indicates a decrease in the motivation for SDLR relationship, which too was further analysed using simple linear regressions (Table 26).

Table 26 Predictive value development individual IVs for SDLR, per sample

Results of Simple Linear Regression Analyses IVs x DV SDLR					
Main Sample	Predictor	β	F	R^2 Adj	t
Pre	Autonomy ^a	.059	0,98	.000	0,99
Post	Autonomy ^b	.398***	33,66	.154	5,80
Pre	Self Efficacy ^c	.241***	17,64	.055	4,20
Post	Self Efficacy ^d	.670***	146,14	.446	12,09
Pre	Motivation ^e	.403***	55,18	.159	7,43
Post	Motivation ^f	.414***	36,97	.167	6,08
Control Group	Predictor	β	F	R^2 Adj	t
Pre	Autonomy ^a	.168	2,98	.019	1,73
Post	Autonomy ^b	.146	1,39	.006	1,18
Pre	Self Efficacy ^c	.098	0,99	.000	1,00
Post	Self Efficacy ^d	.736***	75,48	.534	8,69
Pre	Motivation ^e	.379***	17,08	.135	4,13
Post	Motivation ^f	.422***	13,86	.165	3,72
a. Pre-Intervention Predictor: (Constant), A_IV_AUT					
b. Post-Intervention Predictor: (Constant), P_IV_AUT					
c. Pre-Intervention Predictor: (Constant), A_IV_SE					
d. Post-Intervention Predictor: (Constant), P_IV_SE					
e. Pre-Intervention Predictor: (Constant), A_IV_MOT					
f. Post-Intervention Predictor: (Constant), P_IV_MOT					

The results illustrated in table 26 suggest a difference in the development of autonomy for self-directed learning between the two samples, with an increase found in the main sample, the students in the stage-wise, mixed pedagogical approach to EE (from no predictive value to approx. 15% or from β .059, p =.32 pre- to β .398, p <.001) and a decrease found in the control group (from β .168, p =.09 to β .146, p =.24). Noticeable is the difference between the samples in the relation between self-efficacy and SDLR, with a stronger increase (from β .098, p =.32 pre- to β .738, p <.001 post-intervention) in the control group than in the main sample (from β .241, p <.001 pre- to β .670, p <.001 post-intervention).

Figure 26 Visual presentation of variation impact EE Pedagogy per IV on SDLR



When using the standard coefficients from the regression analysis to compare variance between the two samples (Figure 26), the variation between them appears to be significant for autonomy, but not significant for self-efficacy and motivation towards self-directed learning readiness. To verify if the difference in Mean values between the two samples is indeed insignificant, a t-test was used. The results of t-test reveals that the variance between the samples is statistically significant for self-directed learning readiness after all. These outcomes therefore provide support for the hypothesis that different pedagogical approaches have different effects on self-directed learning readiness. Comparison between the two samples ($N=250$) found that the stage-wise, mixed pedagogical approach to EE, as proposed in the Teaching/Learning Framework and applied in the main sample's VCP CCE, affected students more than the self-steering approach had done, both positively and negatively.

The +.42 Mean Difference between the main sample ($N=185$, $M = .07$; $SD = 1.42$.) and the control group ($N=67$, $M = -.35$; $SD = 1.46$) was found to be statistically significant ($t = 2.03$; $p = .045$) in the post-intervention data set, with a Mean Difference of .42 (df 114,24). The results suggest that the impact of the mixed pedagogical approach of VCP CCE was significantly higher than that of the single pedagogical, self-steering approach to EE for the enhancement of students' self-perceived self-directed learning readiness. The results also indicate that the two different pedagogical

approaches had a significantly varying impact on the students' self-perceived maturity level of autonomy post-intervention.

Table 27 T-Test Results Comparison between Samples

T-Test Results assuming no equal variance between samples
Post Intervention

Sample Group	Variable	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>MD</i>	<i>df</i>
Main Sample (CCE)	SDLR	183	.07	1.42	2.03	.045	.042	114.24
Control Group		68	-.35	1.46				
Main Sample (CCE)	Autonomy	183	-.20	1.33	-3.36	.001	.63	120.34
Control Group		68	.43	1.33				
Main Sample (CCE)	Self Efficacy	183	-.03	1.01	1.61	.11	.27	104.31
Control Group		68	-.30	1.20				
Main Sample (CCE)	Motivation	183	.39	.69	-.62	.54	-.05	143.18
Control Group		68	.45	.57				

T-Test Results assuming no equal variance between samples
Pre Intervention

Sample Group	Variable	<i>N</i>	<i>M</i>	<i>SD</i>	<i>t</i>	<i>p</i>	<i>MD</i>	<i>df</i>
Main Sample (CCE)	SDLR	299	-.01	1.73	-.20	.84	-.04	181.59
Control Group		106	.03	1.76				
Main Sample (CCE)	Autonomy	291	.10	1.38	2.29	.02	.38	173.14
Control Group		105	-.28	1.48				
Main Sample (CCE)	Self Efficacy	291	.11	1.67	2.04	.04	.42	166.67
Control Group		105	-.31	1.88				
Main Sample (CCE)	Motivation	291	-.05	1.39	-1.25	.21	-.21	175.20
Control Group		105	.15	1.47				

The -.63 difference between the Mean of main sample ($M = -.20$, $SD = 1.33$) and the Mean of the control group ($M = .43$; $SD = 1.33$) was substantial enough to be of statistical significance ($t = -3.36$, $p < .001$), indicating that the students in the main sample ($N = 183$) experienced a slight decrease of self-perceived autonomy, whereas that of the students in the main sample ($N = 68$) was slightly enhanced. No statistically significant variation was found post-intervention between the samples for the learner characteristics self-efficacy and motivation.

Comparison of the sample sets on the differences in Mean between the moments of assessment (pre- vs post-intervention) illustrates the variance in impact that the EE modules have had on the development of the self-perceived maturity levels of the variables. The results in table 28 illustrate comparable results of the significant variation found in the t-test results of the post-intervention data (presented in table 27 above), which suggests that the variation between pedagogical approaches in impact on maturity of SDLR and autonomy is statistically significant.

Table 28 Comparison of T-Test Result M development variation between samples

T-Test Results comparison between pre- and post-intervention

		Variable	Test	<i>N</i>	<i>M</i>	<i>SD</i>	<i>MD</i>			VAR - Test	<i>N</i>	<i>M</i>	<i>SD</i>	<i>MD</i>
Main Sample (CCE)	SDLR	PRE	299	-.01	1.73			Control Group	SDLR	PRE	106	.03	1.76	
	SDLR	POST	183	.07	1.42	+.08	SDLR		POST	68	-.35	1.46	-.38	
	AUT	PRE	291	.10	1.38		AUT		PRE	105	-.28	1.48		
	AUT	POST	183	-.20	1.33	-.30	AUT		POST	68	.43	1.33	+.71	
	SE	PRE	291	.11	1.67		SE		PRE	105	-.31	1.88		
	SE	POST	183	-.03	1.01	-.14	SE		POST	68	-.30	1.20	-.01	
	MOT	PRE	291	-.05	1.39		MOT		PRE	105	.15	1.47		
	POST		183	.39	.69	+.44	POST			68	.45	.57	+.30	

The Mean Difference variation between the impact of EE in the main sample (MD+.08) on SDLR versus that indicative of the impact of EE in the control group (MD = -.38) is MD -.46. These results suggest that the impact of the stage-wise, mixed pedagogical approach on the students' perceived maturity of self-directed learning readiness was significantly higher ($p<.05$) than that of the single, self-steering approach to EE. The Mean Difference variation between the impact of EE in the main sample (MD = -.30) on autonomy versus that indicative of the impact of EE in the control group (MD = +.71) is MD +1.01, which illustrates that the self-steering approach had a statistically significant at ($p<.001$) higher impact on autonomy maturity than the stage-wise, mixed approach to EE had on its participating sample population.

The non-parametric test of the significance of the variation between the samples confirms that variation in self-directed learning readiness and autonomy is significant between the samples, and that variation between the samples for the predictive values of self-efficacy and motivation for self-directed learning are not significant (Table 29).

Table 29 Non-Parametric Test Results of Null Hypotheses

Hypothesis Test Summary			
Null Hypothesis	Test	Sig. ^{a,b}	Decision
1 The distribution of P_DV_SDLR is the same across categories of Sample Group.	Independent-Samples Mann-Whitney U Test	0,049	Reject the null hypothesis.
2 The distribution of P_IV_AUT is the same across categories of Sample Group.	Independent-Samples Mann-Whitney U Test	0,001	Reject the null hypothesis.
3 The distribution of P_IV_SE_Effort and Perseverance is the same across categories of Sample Group.	Independent-Samples Mann-Whitney U Test	0,100	Retain the null hypothesis.
4 The distribution of P_IV_MOT is the same across categories of Sample Group.	Independent-Samples Mann-Whitney U Test	0,899	Retain the null hypothesis.

a. The significance level is .050.

b. Asymptotic significance is displayed.

4.7 Impact of SARS-Cov-2 enforced lockdown on results

To control for the influence of the unique circumstances of the societal lockdown, due to the outbreak of the Sars-Cov-2 pandemic, on the studied samples, several cross-sectional analyses have been conducted. A bivariate Pearson Correlation test was conducted to measure the degree of correlation between the survey-question (Q5) 'how the students were dealing with the SARS-Cov-2 imposed lockdown situation (from 1.struggle to 5.thrive) and six questions in the survey questionnaire that represent behaviours characteristic for maturity levels of motivation and self-efficacy.

The results presented in table 30 show that having to work in isolation was indeed correlated to students' motivation, expressed in their degree of engagement in online learning activities, their contribution to the team effort, and their enthusiasm for the course. The question was also correlated to students' participation in brainstorm sessions, comfort with speaking up in class and in reaching out to stakeholders to gain input for their projects / student ventures. The results show that the correlations are

Table 30 Correlations Dealing with SARS-Cov-2 lockdown x IVs and DV

Correlation results Lockdown x Motivation and Self-Efficacy

Function	df	r	Sig.
Lockdown x Online Collaboration	r(259)=	.14*	p=.02
Lockdown x Contribution to Team Effort	r(259)=	.24**	p<.001
Lockdown x Enjoying the module	r(259)=	.34**	p<.001
Lockdown x Participation in Brainstorm sessions	r(259)=	.25**	p<.001
Lockdown x Comfort speaking up	r(259)=	.18*	p=.004
Lockdown x Reaching out to Stakeholders	r(259)=	.24**	p<.001

Correlation results Lockdown x Ivs & SDLR

Function	df	r	Sig.
Lockdown x Self Directed Learning Readiness	r(252)=	.39**	p<.001
Lockdown x Autonomy	r(251)=	.05	p=.45
Lockdown x Self-Efficacy	r(251)=	.61**	p<.001
Lockdown x Motivation	r(251)=	-.01	p=.85

statistically significant. The correlation between dealing with the impact of the lockdown

with the independent variables (autonomy, self-efficacy, and motivation) and with the dependent variable (self-directed learning readiness) proved to be statistically significant too. These results suggest that the more the students struggled in the online situation, the lower their perceived levels of autonomy, self-efficacy, and motivation, and the lower their readiness to be self-directed in their learning were, and the more comfortable they were, the higher the maturity levels of measured variables.

Because no conclusion can be drawn based on these results regarding the predictive value that the lockdown has had on the dependent variables, the students perceived maturity levels of autonomy, self-efficacy, motivation, and on the independent variable of perceived self-directed learning readiness, this was tested with simple regression analyses.

The results, as presented in tables 31 and 32 (p.142-143), illustrate that how well students managed to deal with studying in the SARS-Cov-2 lockdown did affect the predictability of the independent variables at a statistically significant value of $p < .001$ for self-efficacy of students in both samples, and for self-directed learning readiness post-intervention in the main sample and in the samples combined. The predictive value of the lockdown was also found to be a statistically significant predictor ($p = .001$) for perceived self-directed learning readiness post-intervention of the students in the control group. The anticipated effect of the lockdown on motivation ($\beta = .177$, $p = .002$ in the main sample and $\beta = -.201$, $p = .04$ in the control group and $\beta = .182$, $p < .001$ for the samples combined) prior to participating in the EE-modules seems to have diminished to non-significant values ($\beta = .035$, $p = .62$, $\beta = .146$, $p = .24$, and $\beta = .012$, $p = .85$ respectively) upon completion of the modules.

These results seem to confirm that student behaviour has been influenced by the unique situation of the lockdown, which has consequences for the generalisability of this research. This will be addressed in more detail in the chapter Limitations. The remainder of this subchapter presents the findings of the template analysis of the qualitative data strand to explain how the situation above and other, more common elements, in the social learning context affected the progress of the students' characteristics for self-directed learning readiness and what can be learnt in terms of how the social learning context influences students' willingness and ability to self-direct their learning.

Table 31 Simple Linear Regression results for effect SARS-Cov-2 lockdown on IVs

All Samples	DV Test	β	F	R2 Adj	t
	AUT Pre	.152**	9,26	.020	3,04
	AUT Post	.048	0,58	-.002	0,76
	SE Pre	-.028	0,32	-.002	-0,56
	SE Post	.613***	150,10	.374	12,25
	MOT PRE	-.182***	13,45	.031	-3,67
	MOT Post	-.012	0,04	-.004	-0,19
	SDLR Pre	.026	0,28	-.002	0,52
	SDLR Post	.393***	45,66	.151	6,76

Predictor: (Constant), Dealing with Lockdown situation

*** $p < .001$, ** $p < .01$, * $p < .01$

Fitted Models Simple Linear Regression Lockdown Effect on Predictability of Variables

PRE INTERVENTION		POST INTERVENTION	
AUT	-.414 + .152(autonomy), $p = .003$	AUT	-.258 + .048 (autonomy), $p = .45$
SE	.095 - .028 (self-efficacy), $p < .57$	SE	-2,43 + .613*** (self-efficacy), $p < .001$
MOT	.497 - .182 (motivation), $p < .001$	MOT	.434 - .012 (motivation), $p = .85$
SDLR	-.084 + .026 (SDLR), $p = .60$	SDLR	-2,02 + .393 (SDLR), $p < .001$

Predictor: (Constant) Dealing with Lockdown situation

Overall regression results from Simple Linear Regression Lockdown Effect on Predictability of Variables

PRE INTERVENTION		POST INTERVENTION	
AUT	$R^2 .023, F(1,394)$ 9,26, $p = .003$	$R^2 .002, F(1,249)$ 0,58, $p = .45$	
SE	$R^2 .001, F(1,394)$ 0,32, $p = .57$	$R^2 .376, F(1,249)$ 150,10, $p < .001$	
MOT	$R^2 .033, F(1,394)$ 13,45, $p < .001$	$R^2 .000, F(1,249)$ 0,04, $p = .85$	
SDLR	$R^2 .001, F(1,394)$ 0,28, $p = .60$	$R^2 .154, F(1,250)$ 45,66, $p < .001$	

Predictor: (Constant) Dealing with Lockdown situation

Table 32 Simple Linear Regression Results for Effect SARS-Cov-2 Lockdown on Variables, per sample

Main Sample	DV	Test	β	F	R^2 Adj	t
	AUT	Pre	.172**	8,77	.026	2,96
	AUT	Post	.123	2,77	.010	1,66
	SE	Pre	.055	0,89	.000	-0,94
	SE	Post	.601***	102,37	.358	10,12
	MOT	PRE	-.177**	9,39	.028	-3,07
	MOT	Post	.035	0,22	-.004	0,47
	SDLR	Pre	.073	1,59	.002	1,26
	SDLR	Post	.379***	30,73	.139	5,54

Control Group	DV	Test	β	F	R^2 Adj	t
	AUT	Pre	.110	1,26	.003	1,12
	AUT	Post	.057	0,21	-.012	-0,46
	SE	Pre	.049	0,25	-.007	0,50
	SE	Post	.629***	43,31	.387	6,58
	MOT	PRE	-.201*	4,33	.031	-2,08
	MOT	Post	.146	1,44	.006	-1,20
	SDLR	Pre	-.110	1,29	.003	-1,13
	SDLR	Post	.392**	11,79	.140	3,43

Predictor: (Constant), Dealing with Lockdown situation

- a. Pre-Intervetion Predictor: (Constant), A_IV_AUT
- b. Post-Intervetion Predictor: (Constant), P_IV_AUT
- c. Pre-Intervetion Predictor: (Constant), A_IV_SE
- d. Post-Intervetion Predictor: (Constant), P_IV_SE
- e. Pre-Intervetion Predictor: (Constant), A_IV_MOT
- f. Post-Intervetion Predictor: (Constant), P_IV_MOT

*** $p < .001$, ** $p < .01$, * $p < .05$

Dependent variable is Self-Directed Learning Readiness

4.8 Summary

The results from the quantitative analyses seem to confirm the hypotheses that self-efficacy and autonomy predict motivation (H1), and that self-directed learning readiness is predicted by maturity levels of autonomy, self-efficacy, and motivation (H2), as suggested in the SDL literature. The results of the analyses seem to also confirm the hypothesis that EE pedagogy moderates these relationships (H3), with a more positive impact on preparing students for self-directed learning readiness through the proposed stage-wise, mixed pedagogical approach to teaching/learning, but a more positive effect on maturation of autonomy through a single pedagogy, self-steering approach to teaching/learning EE. The variation between the samples with regards to maturation of self-efficacy and motivation was found to be not significant. Their predictive value for self-directed learning readiness was however found to be statistically significant upon completion of each of the EE modules, confirming that EE enhances these personal characteristics for learning and that of their relationship to self-directed learning readiness.

Controlling for the impact of 'Dealing with the SARS-Cov-2 lockdown of society' has revealed that this situation did indeed affect the research participants to such a degree that the reported results may be distorted. Having to study in the EE modules under the lockdown circumstances was found to have a statistically significant effect on self-efficacy and self-directed learning readiness, making the results presented in this study likely not representative for the effects of EE on SDLR under 'normal' circumstances.

The results may be interpreted differently, as where some students apparently thrived, others seem to have suffered, and where some seem to have experienced personal growth, others seem to have lost confidence and motivation. The results presented are conclusions drawn upon the limited information that was collected with the two survey questionnaires only. The following subsection presents the findings from the analysis of the qualitative data strand with the intent to seek explanation and substantiation for the phenomena found in the quantitative data.

5 Findings of the Qualitative Data Analysis

Introduction

The results in chapter 4 illustrate that motivation for learning in EE relates to students' self-perceived maturity levels of autonomy and self-efficacy and that this relationship was strengthened through their participation in the studied EE modules. The chapter also illustrated that participation in EE enhanced the participants' self-directed learning readiness, especially in the studied sample that followed the stage-wise, mixed pedagogical approach to learning as applied in the VCP module that is grounded in the approach applied in Junior Achievement's (Student) Company Programme. This subchapter seeks explanation for these results through a deductive template analysis of the free response items in the two (mid- and end term) open question survey questionnaires and the focus group discussions.

To facilitate a deeper understanding of how entrepreneurship education might relate to self-directed learning readiness, the conceptual framework was developed from the themes identified through discourse analysis. Two major external factors were identified in the educational- and self-directed learning literature that proposedly influence learners' perceived maturation of learning skills, including those identified as characteristic for self-directed learning readiness,

- 1) the teaching-learning process and
- 2) the social context in which the learning takes place.

Within these themes several subsidiary themes were identified, which will be discussed in the following sections.

The first step of the data analysis consisted of reading and categorising all the free response items in the open-question survey about what had affected the students' enthusiasm to (pro)actively participate in their EE modules. The responses were initially categorised in the themes identified in the conceptual framework (example provided in appendix 4) and a-priori coded as 'Teaching-Learning Process' and 'Social Learning Context'. I then carefully read them again to gain an overall understanding of what they represented and how that helped answer the questions posed in this research.

The results of the open question surveys have been substantiated with the results from the focus group discussions with participating students and teachers to create a more holistic understanding. The results are presented in two separate sections. Section 5.2 presents the explanatory results of the influence that the teaching-

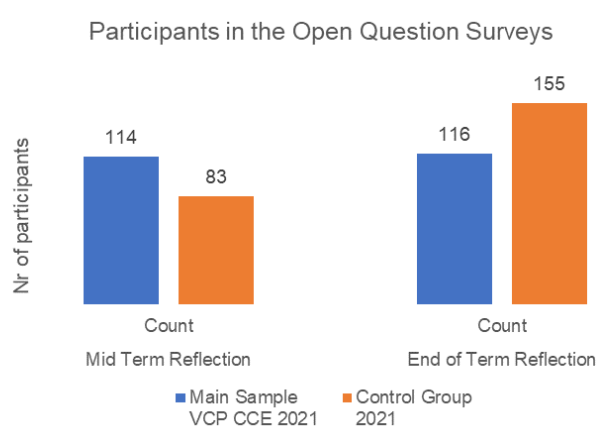
learning process in the studied samples has had on the enhancement of the participants' learning characteristics and how this affected their autonomous motivation for self-directed learning. In section 5.3 explanation is sought for the effect of the social learning environment on the participants perceived maturation of autonomy, self-efficacy, and motivation to self-direct their learning tasks within and beyond the EE module studied.

Synthesis of the results, which will be presented in chapter 6, provides a deeper understanding of how students experienced learning in the studied EE modules and how this affected their autonomous motivation and perceived ability to identify and pursue learning opportunities.

5.1 Demographics of participants

The sample population of the open question surveys (Figure 27) consists of respondents to the pre-intervention survey. The population has not been controlled for demographics other than the sample group they represent.

Figure 27 Mid- and End-Term Evaluation Survey participation per sample



Three separate focus group interview sessions were organised to gather experiences from different angles by selecting three different groups of participants, each session consisting of a group of participants representing a specific role in the VCP CCE module. For the first focus group interview session 48 students in the role of student venture director or team leader were invited by personalised email, of which 10 agreed to participate. For the second focus group interview session 17 teaching/coaching assistants were invited by personalised email, of whom 8 agreed to participate, and finally all 17 teacher/coaches assigned to the VCP CCE were invited,

8 of whom agreed to participate. Finally a semi-structured interview was held with the course director (Table 33).

Because the recording of the focus group session with the teaching/coaching assistants was no longer available when I started the transcription phase, this data has been excluded from the research. The selection of participants in the data used is sufficiently representative though to contribute to a deeper understanding of the intervention effects. It adds multiple perspectives, increasing reliability of the results by limiting bias.

Table 33 Interview Sample Demographics

Nr	Code	Role	Time at AMSIB	Entrepreneurship Experience
1	ST1	Student	Y1	Y
2	ST2	Student	Y1	N
3	ST3	Student	Y1	N
4	ST4	Student	Y1	N
5	ST5	Student	Y1	N
6	ST6	Student	Y1	N
7	ST7	Student	Y1	N
8	ST8	Student	Y1	N
9	ST9	Student	Y1	N
10	ST10	Student	Y1	N
11	MAA	Teacher / Coach	3 yrs	Y
12	JVE	Teacher / Coach	8 yrs	N
13	HAG	Teacher / Coach	17 yrs	Y
14	ABO	Teacher / Coach	8 yrs	Y
15	RJS	Teacher / Coach	18 yrs	N
16	TZW	Teacher / Coach	trainee	Y
17	IDB	Teacher / Coach	6 yrs	N
18	AWG	Teacher / Coach	9 yrs	N
19	RJS	Course Director	18 yrs	N

5.2 Findings Students experience of the Teaching-Learning Process

Two major themes that related to the students' experience of the teaching/learning process, and which also connected with the conclusions from the literature review, were identified from the survey responses. These themes consist of the contextual learning setting and the pedagogical guidance within the learning context. Within these major themes 8 subsidiary themes were identified. Together these constitute the influences from within the teaching-learning process assumed to moderate on the individual student's characteristics for self-directed learning readiness as shown in figure 27 and further described and illustrated with extracts from the survey responses and focus group transcripts.

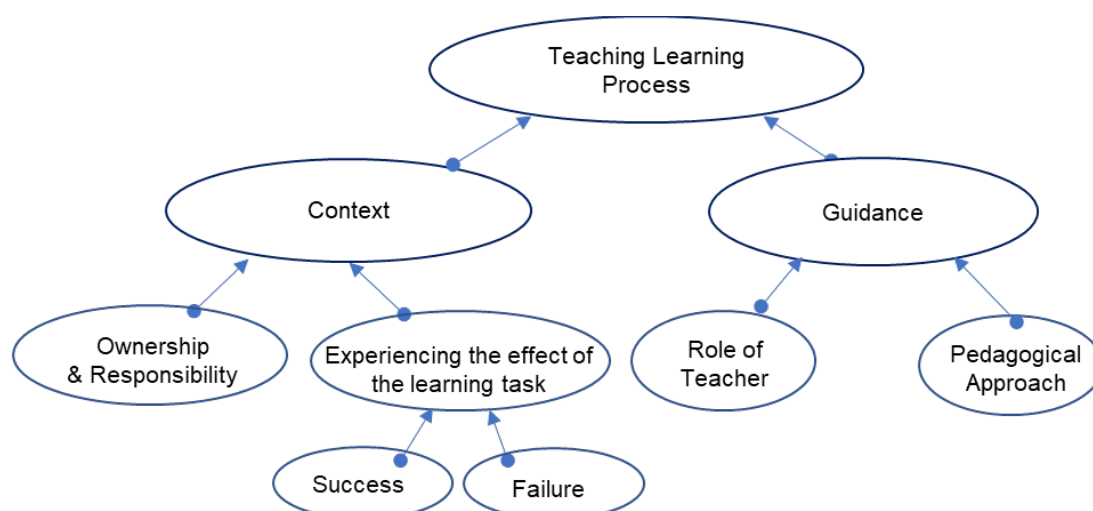
The analysis of the free response comments in the end-term survey (Table 34) that asked the students to explain the score (1 lowest-10 highest) they had given for their motivation throughout the course, what they had enjoyed most and what least, were categorised in accordance with the themes identified in the discourse.

Table 34 TLP Themes identified in qualitative responses

Counts Themes Free Response		
Items	Positive	Negative
Authentic Contextual setting	183	11
Experience of Success	67	19
Team dynamics	77	31
Freedom / Autonomy	30	11
Ownership	66	2
Role of Teacher	13	32
Course Structure	6	0
<i>N =</i>	442	106

After recategorizing the above themes, the responses coded with team dynamics were moved to the a-priori theme "Social Learning Context". Six lower-order codes (Figure 28, next page) were generated and grouped to two major themes: authentic contextualised learning and pedagogical guidance. Two of these codes could be grouped with the authentic or contextualised setting of the module and two with pedagogical guidance.

Figure 28 Teaching Learning Process Coding



5.2.1 Impact of Contextualised Teaching/Learning

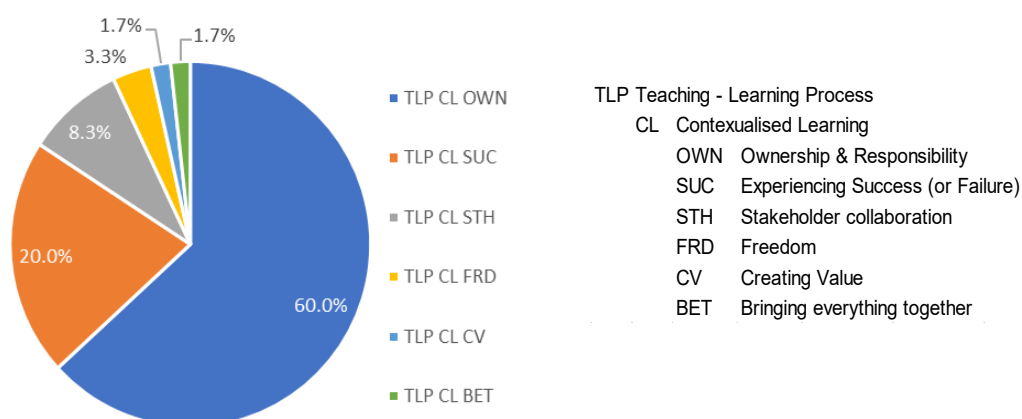
“Starting the actual business is the most fun part of the whole IB course so far “
(ETS respondent 23)

The first concept in the teaching-learning process is that of a contextualized teaching/learning setting, in other words learning in settings representative of the real-world. Authentic learning contexts allows for students to experience the effects of actions taken in their learning activities (Robinson et al, 2016). Seeing how their choices lead to either successful or non-successful results in real-world settings and obtaining feedback from relevant stakeholders other than teachers tends to enhance learners’ sense of ownership over and responsibility for the effect and outcomes of their learning activities. Proposedly, undertaking learning tasks in such authentic learning contexts can be perceived as challenging, sometimes daunting, especially when learners do not feel they are ready for the task (Eccles, 2005; Pintrich and Schunk, 2002; Bandura, 1993). Autonomous action and motivation for self-directed learning was proposed and confirmed to be related to such task-related self-efficacy and influenced by the teaching/learning environment of the modules studied for this research, all of which can be categorized as being reflective of the authentic context of entrepreneurship. This theme is illustrated by the responses in the two open question surveys and the focus group discussions, as presented below.

Applying King’s (2004) template analysis for further analysis of the category Contextualised Teaching/Learning generated initially 6 lower order codes (Figure 29),

most of which (60%) could be coded within the themes “ownership and responsibility” and “Experiencing the effect of the learning task”.

Figure 29 Distribution of Positive influences on motivation - End-Term Survey



From the arguments supporting their reported degree of satisfaction with the course, the overall experience of the students seems to particularly value the authenticity of the modules. The high volume of comments related to experiencing success supports the argument that experiencing application of knowledge and skill in an authentic, real-life context is more effective than simulating such contexts, as students experienced the effect of their decisions and actions. Meaningful feedback on the way the learning tasks were performed was received not only from a teacher, but from relevant stakeholders in the real-world setting too. As such the students received not only a theoretical, or hypothetical, explanation of how to best apply knowledge and skill, but experienced the effects as they are in the real world. That this has a substantial impact on students' confidence and thus motivation is illustrated by the many comments in the survey and the responses in the focus group discussions. Students refer frequently to having taken ownership over their learning tasks, feeling responsible for their actions, and having been stimulated when they experience their actions to be successful, as illustrated in the following sub-sections.

5.2.1.1 Ownership and Responsibility

“I enjoy the fact that I can see what it's like to create our own company from scratch. It is a very fulfilling experience to see a raw idea transform into something real, tangible.”

(Free Response Item FRI 46)

The modules studied in this research are designed to provide the boundaries within which to find and exploit a (business) opportunity, but giving the students the freedom to discover, negotiate and determine their own learning strategies and actions within these boundaries. With this freedom to determine how to approach the learning challenges whilst having a pre-determined goal and set timeframe, the students were put in the driver's seat of their own and each-others' learning process. This approach to teaching/learning is radically different than what the students are used to when they enter higher education from a high-school background only and calls upon their maturity levels of autonomy as well as self-efficacy. No longer facilitating reactive learning behaviour forces students to take ownership over and responsibility for their own and their collective learning. Analysis of the responses illustrates that such perceived ownership over and responsibility for making the learning activities a success was among the most dominant (60%) factors affecting motivation (Figure 29, previous page). Comments indicative of this include:

“The part I like the most is that we are just in year one and already get so much responsibility of our own company” (FRI 285).

“The assignment made me feel proud of myself, since I know that I have worked very hard with some of my team members to fix necessary parts, as well as creating my own part for the assignment” (FRI 201).

“I enjoy the experience with real-life roles within the company, which makes me work so much harder” (FRI 54)

“It is a very fulfilling experience to see a raw idea transform into something real and tangible” (FRI 52).

“I enjoyed the real-world application and how that pushes you to do better research and find a solution to a complex issue” (FRI 67).

“our team was super motivated to make our ideas work, so much so that throughout the first block there was never the question about what we needed to do to pass the module, everyone was just really excited and involved” (SFG P1).

Some express the EE module to be the first assignment they really looked forward to as they explain how they wanted to work on this project so much that it was not experienced as a school-assignment due to its practicality and authenticity. Some

go so far as stating that *“Starting the actual business is the most fun part of the whole International Business course so far”* (FRI 69).

Students in the control group report being particularly motivated by the experience of working with and for real companies and real clients, as it allowed them to see, hear and experience what it takes to be part of a real business. The experience of having to act as a business professional pushed them out of their comfort zone and allowed them to develop professional behaviour skills, which they felt were not quite as much stimulated in the simulated settings of other modules. The students experienced the way of teaching-learning to have given them a lot of responsibility and freedom, which contributed to their motivation and self-efficacy. The following quotes illustrate this.

“The course pushed me out of my comfort zone and allowed me to develop professional behaviour skills” (FRI 62)

“I liked that the module facilitated our transformation from student to young professional. The way of teaching gives the student a lot of responsibility and freedom, which is in line with professional work. (FRI 65)

“It was a really inspirational experience and although it would've been amazing to be able to have done this in person [instead of online due to the Covid-19 lockdown] I have enjoyed it a lot and learnt so much about not only the business side of things but personal skills such as being proactive, planning, acting as a leader and working hard.” (FRI 235)

The overall impression gained from reviewing the responses is that the autonomy given to the students, to take ownership over and responsibility for their own decisions and actions to create a business contributed not only to their motivation for self-directed learning, but also explains the significant enhancement of self-efficacy – self-directed learning readiness relationship. This supports the findings that purposefully organised learning circumstances, contextualised and subjectivized in authentic settings, triggers the recognition of development need and a desire to fulfil learning requirements (Robinson et al., 2016; De la Harpe and Radloff, 2010; Gibbons, 2002).

5.2.1.2 Experiencing the effect of the learning task - Success and Failure

“Upon realising that the idea and the work put into the making of the product was a success, the team got really excited, they say like ‘oh my god this really works, we are actually making real money’. And it just continued from there.”

CEO CCE Student Company

Motivation for learning is strongly related to self-efficacy in the discourse of education and in that of self-directed learning and affected by what the theory of self-efficacy refers to as enactive mastery (Bandura, 1977). Experiencing progress on tasks and goals is related to enhanced levels of self-efficacy, autonomy, and motivation and to enhanced willingness to work hard, persevere when things don't go as planned and deal with ambiguity and setbacks. Experiencing lack of success or failure on the other hand is related to decrease of self-efficacy, autonomy, and motivation and to task-avoidance (Schunk, 1991). Chapter 4 illustrated that self-efficacy correlates statistically significant with motivation and with self-directed learning readiness, and that it is the most dominant predictor for motivation and for self-directed learning readiness upon completion of the EE module. This theme is illustrated by the volume of responses that explain how experiencing success has had a positive impact on enhancing students' self-efficacy and motivation, and how lacking success had the opposite effect. Experiencing the effect of learning activities in the real-world context, related to success or lack thereof, ranked as the second most frequently mentioned influencer on self-efficacy (Table 35).

Table 35 Elements affecting Self-Efficacy

Influencers on Self-Efficacy	
TLP CL Ownership	12%
TLP CL Experiencing Success	32%
TLP Hierarchical Competence Development	38%
TLP Role of Teacher	11%

N=194

In the open questions raised in the mid-term evaluation students report that when the teams felt good about their company, believing in the potential success of the business, they were “*enthusiastic about bringing the ideas to the market*” (FRI 94), motivation was high in teams that strongly believed in the feasibility of their business

concepts. The impact of experiencing success in the conceptual phase of the VCP is illustrated by comments such as:

"I felt good about myself as people were telling me my ideas are good" (FRI 232)

"I felt empowered by discovering the business proposition's feasibility" (FRI 93)

"Finding that the answers [to the validation questions] were as predicted and hoped for boosted our motivation to continue with developing the idea" (FRI 97).

"I am very excited to for the company to start" (FRI 100).

"I felt empowered because I had the feeling that we actually had a good product, and that people would actually buy it from us. I wanted to find out more about the market and what would be necessary to pull this off, so it did motivate me. At first I was hesitant when it comes to starting a business because I am not an entrepreneur but when the classes continued, I got more excited to actually start the business" (FRI 223).

The responses in the end-term evaluation survey explain that motivation and self-efficacy became stronger in those teams who did indeed see their business concept succeed. The following responses illustrate the positive effect of experiencing success: Reflecting upon completion of the EE module, students describe how:

"discovering that people were actually interested in buying their products triggered me to do research on how best to market the business" (FRI 92)

"I enjoyed the process of actually making the product and see the company grow" (FRI 95).

Receiving positive responses to their business propositions from real stakeholders in the first block and generating actual sales with the products or services they themselves had chosen to market is frequently described as having been stimulating and empowering, increasing motivation and enthusiasm. In the focus group discussion on the topic of motivation issues in the teams, one of the participants mentioned:

"I did not experience the lack of motivation in my team. One of the factors for motivation is the money.... sometimes I announce during meetings or after meeting with our teacher "we made EUR80 during this meeting", and everyone is happy". (FGP6)

Teacher-coaches in the VCP CCE module confirm witnessing a gradual shift from controlled towards more autonomous motivation and enhanced levels of self-efficacy in teams that believe in their concept and experience success. Behavioural change is detected in the more proactive approach to learning tasks, students taking more control over their learning process and initiating more daring entrepreneurial

learning tasks, showing an increased tolerance of ambiguity. This is illustrated by this extract from the focus group discussion with teachers:

“it was such a wonderful experience to see how they [the students] became so much more involved and enthusiastic once they had that experience of validating their business idea with potential customers outside their ‘warm network’ [of family, friends and relatives]. When they started to realise that what they were trying to accomplish was actually feasible” (TFG AWG).

However, the fact that a team experiences success does not mean that all members within the team benefit equally from the experience. Because the teams in the VCP project’s (main sample) business execution phase are relatively big (approx. 10 – 15 students), roles are divided, and a company structure is introduced that represents either a matrix organisation or a division structure. As such, students in a marketing or sales role can have different experiences from students in a procurement or administrative role. How this affects students is illustrated in the following extract from the teacher focus group discussion.

“I had one team this semester that had one student in it who was absolutely not motivated for a long time, while the company was doing pretty good. He was just complaining and basically dragging the team’s entire spirit down. At some point the team leader addressed me with a call for help. I advised him to ask this student what he needed to become a valuable member of the team. What happened after that was amazing. The student had told the team leader that he did not feel comfortable with his role in sales because he didn’t really support the product that the team promoted. When asked what he would like to do instead he had asked for if instead he could get an internal function, more specifically to create the website and organise the online activities. Once the team agreed with the switch of role, this student became one of the most enthusiastic members on the team. His team-mates praised him for what he made and each time he himself became more enthusiastic” (TFG ABO)

The correlation between experiencing success and feeling motivated for the course was also made visible upon comparing the free response items in the end term survey with the scale question that rated how much the students had enjoyed the EE module. Among the students who had indicated in the end term survey that they had enjoyed the module very much (with a score between 8 and 10), 52% had experienced success, which contributed to their feeling of empowerment and motivation. Among the less motivated students, success was identified more frequently as a demotivator (33%) than a motivator (16%). Students who experienced lack of success had more difficulty maintaining their overall motivation for the course. Elements reported that had contributed to the students experiencing failure in the VCP CCE were having received negative feedback and results on their propositions, which made them lose confidence,

not only in the idea, but frequently also in their own abilities for the task at hand. The following extract illustrates this theme:

“I'd say it was rather unrewarding and it felt like regardless of effort we were unable to make much progress as it was turned down at every corner. This in turn created a lack of motivation for me and my team members, and the enthusiasm was quite low. We'd slog through lectures and then just work on it together as a team and figure out how to start it after” (FRI 156).

The overall impression gained from analysing the comments in the surveys and the discussions in the focus groups is that experiencing the consequences of the choices and decisions made in the learning activities is what had a significant influence on the students' perceived self-efficacy and motivation. Motivation and self-efficacy were enhanced by the positive experiences. The impact of experiencing lack of success appears to be equally substantial, but then negatively affecting motivation and self-efficacy.

The findings support the proposition that motivation for learning arises from thoughts and beliefs about one's own abilities (Pintrich and Schunk, 2002), as they are being perceived by the learner prior to, during and after the learning activity (Schunk, 2009). Goals, expectations, and task-related self-efficacy relate to effort and perseverance, all of which are influenced by experiencing mastery and receiving feedback from relevant others (Eccles, 2005; Eccles and Wigfield, 2002; Bandura, 1977). It also supports the proposition that an educator plays an important role in the process of preparing the learner for the new learning challenges (Candy, 1991), as will be discussed in the following section.

5.2.2 Impact of Pedagogical Guidance

The self-directed learning discourse suggests a hierarchical approach to constructing task-related self-efficacy, which in turn is related to autonomous motivation for approaching challenging learning tasks. The hierarchical approach consists of various phases, starting with the acquisition of foundational knowledge and the recognition of application of such foundational knowledge towards independent practice of knowledge and skill in authentic circumstances. Several pedagogical approaches have been proposed to transform students in entrepreneurial agents, capable of self-negotiated action (Jones et al., 2019), mainly applying a hierarchical process of competence development, combining passive learning with active learning. In the hierarchical learning process evaluated for this research, an additional phase was

included and evaluated in the competence development process. Adding to the competence development process proposed by Macht and Ball (2016) and Bell and Bell (2020), that of constructing a cognitive framework (theory) before experiencing the learning task in its authentic setting, is the phase of practicing the application of the learning task in a simulated (classroom) setting prior to executing the learning task in the authentic learning situation. The role of the educator in the learning process varies continuously to match the competence development phase of the students, related to the learning task. This section seeks explanation for the variation in impact of the pedagogical approaches studied, as presented in chapter 4.

Analysis of the responses categorised in the theme 'pedagogical guidance' generated 4 lower-order codes i) pedagogical approach ii) instruction and choice, iii) feedback and support, and iv) role of the educator. The pedagogical approach considered the various pedagogical approaches discussed in the entrepreneurship education discourse and included the stage-wise, mixed pedagogical approach proposed by this research. The themes ii) instruction and choice, and iii) feedback and guidance will be presented as part of the role of the educator.

5.2.2.1 Impact of the Pedagogical approach

The main difference between the two samples studied is that the VCP CCE module is characterised by an integrated pedagogical approach of learning *about, for, in* and *through* entrepreneurship, as summarised in the proposed teaching/learning framework for enhancing SDLR (Figure 9, page 65) with lectures, discussions, case studies, participative workshops and contextualised real-world learning tasks applied in each phase of the learning process. The population of the control sample, consisting of students who have been through that integrated learning process in the VCP CCE a year earlier, participated in a completely self-steering learning approach in which no theoretical support was given, nor practical workshops. In this module the students were expected to integrate the knowledge and skills gained about and for the various disciplines of entrepreneurship in an entrepreneurship simulation or real-world setting (business consultancy). Guidance was limited to process, not content. The results in chapter 4 showed that the guided approach in the main sample (VCP CCE) resulted in more enhanced levels of self-directed learning readiness than those of the students in the control group. This subsection seeks explanation for these findings.

The mid-term survey was used for the purpose of evaluating the effect that the various learning approaches (passive – lectures, participative – workshops and self-

steering real-world assignments) had on the students' perception of task-readiness. The survey combined scale questions with free response items to gain a deeper understanding of the impact of each pedagogical approach. The questions to quantitatively 'measure' the degree of reported impact that the various pedagogical approaches had on the students' perceived task readiness are from the perspective of:

- 1) feeling in control to independently approach the learning challenges (autonomy),
- 2) feeling empowered to approach the learning challenges, and
- 3) feeling enthused (intrinsically motivated) to approach the learning challenges.

The free response items asked the students to share what had caused the effect(iveness). The assignments in the VCP CCE are a combination of creation and validation. To pass these assignment, proof of validation from relevant stakeholders is required.

A frequented observation is that students tend to avoid these validation assignments in the real-world when they do not feel ready for the task. This observation can be related to the distinction between performance-based learners and interest-based learners, where performance-based learners are motivated by obtaining results (credits/grades), whereas interest-based learners are intrinsically motivated to experience the learning, and therefore take a more proactive approach to challenging learning goals (Harachiewicz et al., 2016). Performance-based learners may therefore feel insecure in a learning context so radically different from they are used to (Bell and Bell, 2020). This is illustrated by the following extracts from the perspective of the students and from the perspective of the teachers:

"it is difficult to motivate students to run a business when they are graded for it in a study context" (SFGP3).

"I see that because the assignments are mandatory for all students and their grades depend on how well they perform these challenges, some students, especially those who set high standards to themselves, need much more clarity and instruction. Others either simply go ahead and pioneer with the assignments. I also notice that the more comfortable the students are and the more they believe in the concept of their business, the more stakeholders they talk to." (TFG AWG)

To overcome this barrier, the module is designed to facilitate hierarchical competence development, starting with the development of a cognitive framework to understand knowledge about the entrepreneurship topics, methods, or tools and how these are applied in real life, then get to practice with it in an in-class workshop to

progress their skill, and then apply the newly gained knowledge and/or enhanced skill in the real-life setting.

The results of the quantitative questions to evaluate the impact of this approach on students perceived task readiness seems to confirm its effectiveness. Table 36 indicates that the classroom-based lectures and tutorials were perceived as important in developing task readiness to independently take control (>57%) and feeling much to very much empowered to approach the learning challenge (59%).

Table 36 Impact Lectures on perceived task-readiness

Impact Lectures				
	Code	Task Control	Empowerment	Motivation
Not at all	1	0%	0%	0%
Somewhat	2	15%	9%	6%
Average	3	28%	32%	43%
Much	4	43%	36%	27%
Very Much	5	15%	23%	23%

The impact of the classroom-based application of the newly acquired knowledge of the entrepreneurship related topics, methods and tools in the participative workshops appears to have contributed to the students' perception of task-readiness too (Table 37). 63% of the respondents indicate that they felt much to very much empowered by the workshops.

Table 37 Impact Workshops on perceived task-readiness

Impact Workshops				
	Code	Task Control	Empowerment	Motivation
Not at all	1	1%	1%	1%
Somewhat	2	7%	4%	5%
Average	3	35%	32%	37%
Much	4	41%	47%	35%
Very Much	5	16%	16%	22%

The answers to the scale questions were motivated with an answer to the questions how the various pedagogical approaches had affected their feeling of empowerment, motivation to find out more and enthusiasm for the course/starting the business. Explanation for the effect that the workshops had on students' sense of task-readiness include:

"I like the tasks after the lectures where the team sits and discusses how we can

apply the theory to our project” (FRI 199),

“I felt empowered from talking with fellow students before talking to customers” (FRI 242),

“the brainstorm sessions with the team helped me feel good about myself” (FRI 239)

“sharing ideas and visions with team members and people I known before talking to companies gave me confidence” (FRI 238)

“It made me feel prepared for taking that challenging step of reaching out to strangers” (FRI 238)

“what helped me was being able to practice before doing things for real” (FRI 236).

Another element frequented in VCP programme that was experienced as an important enhancer of students’ self-efficacy and motivation was what may be referred to as the weekly peer-coaching sessions. Every week the in-class session started with brief pitches by each team about what they had done that week, what they had struggled with and what they had achieved. Each team had 5 minutes to share this with the other teams. The sessions were appreciated and considered an important contributor to building task-related self-efficacy. This theme is illustrated with the following extract from the teacher’s focus group discussion:

“pitching to each other helped the students to reflect on what they did themselves and what they had accomplished. This helped them get a clearer idea of what they were learning and how they were progressing. By sharing this with the class or people from other teams they could get a feel for their achievement level, which I feel, gave them more confidence when they felt they did relatively better than others and it helped to learn from others on things they were uncomfortable with, like the validation assignments for some” (TFG AWG).

This element in the programme seemingly facilitated the enhancement of self-efficacy through role-modelling, which corresponds with the finding that verbal persuasion (Bandura, 1977) and obtaining feedback and examples from role models close to the learner (Bécharde and Grégoire, 2005) are important sources of building self-efficacy.

Providing guided support that allows the students to gradually build their confidence for the challenges is perceived to be particularly important for students whose motivation is extrinsic, particularly when the value sought is performance based. This is illustrated with the following extracts from the student focus group discussions.

“Throughout the first block we never talked about grades at all, there was never the question about what was needed to pass. Everyone was just really excited and involved. But as the course progressed, for some people motivation dropped then they started to ask questions like “what do we actually need to do?” (SFGP1)

“Often times there is a discussion about how tasks would impact our grade, and I usually ask if that is the real question or if it is more about how it [tasks/activities conducted] affects our business, but some people are doing it [tasks / activities] simply to get a good grade. If that is what they are interested in than that is fine, uhm. It does seem to have an impact on how motivated they are with the business challenge” (SFGP2).

This variety in students’ task-readiness is what the SDL literature has referred to as well and provides the rationale for the mixing of pedagogical approaches as to create confidence for all the students, each obtaining maximum benefit from whichever pedagogy suits their needs at that moment best.

How much the activities and the course structure contribute to students’ perceived task readiness is substantiated with the answer to the survey question to indicate how ready they feel to start the business. No less than 65% of the respondents answered to feel very to absolutely ready to get started, as illustrated in table 38.

Table 38 Response distribution perceived task-readiness at mid-term

Q3.To what degree (1 not at all - 5 absolutely) do you agree		
a. I feel ready to start the business		
	Code	Percentage
Not at all	1	0,0%
	2	8,6%
Good to Go	3	25,7%
	4	34,3%
Absolutely	5	31,4%

Comparing the results of the mid-term evaluation of the VCP CCE with the results from the mid-term evaluation of self-steering EE business scale-up module in the control group, shows just how much difference a ‘stage-wise approach’ to learning in an experiential learning setting makes. Of the N=83 respondents from the control group who took the mid-term evaluation of their EE module, the majority (53%) indicated to not be enjoying the module much. The main source of reduced motivation mentioned by students from the control group who were moderately to not at all motivated, was that of the role of the educator (>30%), against <5% of the responses in the main sample, as will be discussed in the next section.

5.2.2.2 Role of the Educator

The role of the educator in preparing students for self-directed learning readiness has been described as helping the learner to acquire the skills for independent study and the willingness to use them (Spear & Mocker, 1984) and as being learning resources, role models and soundboards for learners (Brookfield (1985).

Different roles are required in different phases of the learning process, shifting, when necessary, between that of instructor (expert) to that of coach or supervisor, and in some phases even that of collaborative participant. The involvement of the teacher in flexible roles to cultivate confidence and competence to facilitate self-directedness in the learning process is emphasized in the discourse of (self-directed) learning and illustrated in the analysis of the responses to the open question surveys and discussions.

Students in the VCP CCE report predominantly positive experiences with the various roles of their teacher, as coach, instructor, supervisor, and assessor. This is illustrated with responses such as:

“There was always someone around to help” (FRI252).

“I tend to work better once I have a little guidance, but our CCE coach has already given us a foundation to work with” (FRI251).

“The tutor clarifies tasks and adjusts appropriately every time” (FRI256).

“I was really happy with the insights (project wise, personal and communication wise) provided by our coach. She provided us with good feedback and helped us great” (FRI 116).

During the first few weeks of the module, when students were getting acquainted with the supporting materials, the need for instruction and guidance is perceived to be high. The volume of information available in the digital learning environment was experienced as overwhelming, which requires a balanced approach to teaching/ learning to provide sufficient autonomy for the students to develop and find their own route versus sufficient guidance to help build confidence. This theme is illustrated in the following extract from the teacher focus group discussion:

“I think for students it's very complex and it's a lot of material. It is difficult. Students get afraid they need some kind of guidance ..., presenting elements in digestible bites, taking them by the hand, step by step. But for most of them, most of the time, letting them struggle to find their own way helps them more than just explaining and telling them what to do, that would be too easy. In my opinion it is really like looking for the balance between empowering the students and being helpful, offering what they need” (TFG ABO).

The students in the VCP CCE were guided through the start-up process with weekly assignments to execute a phase in the start-up process of which they had received instruction that week and which they had practiced in the workshop in the class, as such the structure of the course was quite clear, but with freedom for the students to execute

the assignments as they saw fit for themselves. Appreciation for direction and instruction is illustrated with responses such as:

“The fact that I understand the assignment makes it more enjoyable cause I know what I have to do” (FRI 111).

“I felt we were going to the right direction to start and validate the business. It was a bit confused at first as to what the course meant and what the tasks were, but once we started and got acquainted with the materials, I could see the bigger picture” (FRI 207).

“The assignments are a good way to keep track of things and help to figure out if we are on the correct path” (FRI 204).

The module requires flexibility in terms of teacher involvement to gradually build self-efficacy to stimulate autonomous motivation for the existential learning tasks, matching approach with student needs. The question in the focus group discussion with the teachers how they experience this, gives the impression that most pioneer to discover what works best. To match instruction and support to students' needs, some teachers explain how they regularly ask their students for feedback. Their experience with this approach is described as stimulating the students' participation, as illustrated in the following extracts from the teacher focus group discussion:

“I use this approach because I experience that the students feel more comfortable to express what they want to get out of the module and the learning activities in the class” (TFG ABO).

“I think that involving them in the content and structure of the class I give the students a sense of responsibility. They feel their opinion matters. They feel taken seriously in the process and that way they tend to take more ownership over the tasks.” (TFG HAG).

That this is not common practice for all teachers, and that some are struggling to find the right balance between roles becomes obvious from reading the responses. Even though most of the participants in the teacher focus group discussion have multiple years of experience with teaching in experimental pedagogy in higher education, they still feel that they are pioneering. Expressions that indicate their struggle and the disagreement include:

“I have never understood my role as coach. I try to balance between teaching and lecturing and coaching them in the process. Just like AWG, I select the things I think are most important for them to know and then inform them about the rich resources that are available” (TFG JVE).

“I notice each time that if you give them too much instruction, they start to lean back, but if I give too little, they don't take action either” (TFG HAG).

“I think, my doing less has helped them [the students] more” (TFG AWG)

“I go through the lecture materials step by step, and I build it up gradually. Not having the right support and not being able to go and do things when they are ready for it. That was really a motivation killer for quite some students, so I do feel that more structure is needed and more guidance from us as teachers in the process” (TFG MAA).

“by just chewing everything and simplifying, they do not learn to find their way through the data. So, I have no problem with them struggling through it” (TFG ABO)

The balance between providing support when the students needed it and helping them find their own way is what characterises the difference between the two EE modules studied. For these students, who were themselves VCP CCE students a year earlier, the experience of instruction versus freedom was much more negative. In the self-steering approach to EE, as applied in the scale up module BSI, from which most of the complaints were generated, the students were expected to integrate and apply the knowledge and skills they have obtained in the related International Business modules. As such the role of the educator in this module was to simply supervise the teams on progress made in the project and give feedback on and guidance in doing research and integrating the knowledge from the different business disciplines. No active teaching is involved in this module.

Of the 61 negative remarks in the free response items of the end-term surveys to the question to explain the rating they had given to their level of motivation, 46 were related to the role of the educator as process coach. Some examples of responses that illustrate this are:

“Everything is very much left for the student to figure out. A short lecture session each class on relevant topics for the project would be beneficial” (FRI181).

“The course wasn’t enjoyable since the teacher was not useful. He spoke less than 10 minutes and the rest of the class we were in breakout rooms” (FRI183)

“I feel like lots of information is demanded from us to apply with little to no good explanation” (FRI184).

I did not like that we have to figure out basically everything ourselves” (FRI187)

Table 39 Stimulating elements End-Term Survey Control Group²

How much did you enjoy your EE Module		N=83			
3 very much	27%	27%			
2 moderate	20%	20%			
1 not much	53%	53%			

Reason why or why not enjoying the module control group					
3 Positive	Enjoyers of the module	teacher role	Contextual application	feedback	Team work & discussions
FREQ 22		32%	41%	14%	33%
2 Positive	Moderate enjoyers of the module	teacher role	Contextual application	feedback	Team work & discussions
FREQ 17		1%	24%		
2 Negative	Moderate enjoyers of the module	teacher role	Lack of instruction	feedback	Team work & discussions
FREQ 17		35%	24%	18%	29%
1 Negative	Non-enjoyers of the module	teacher role	Lack of instruction	feedback	Team work & discussions
FREQ 44		32%	34%	9%	18%

Taking into consideration that the students in the control group had successfully completed the VCP CCE in the preceding academic year suggests that whilst participating in a mixed-pedagogical approach to EE is strongly correlated with enhancing self-directed learning readiness, one cannot assume that one semester suffices.

The results confirm the importance of an educator's involvement in the role that matches the students' need for instruction and guidance. Students who indicate to be moderately to not at all enjoying the module indicated expecting the educator to provide more guidance, instruction, feedback, and theory. Because all these factors have been theorised to relate to confidence, these results suggest that the students in the control group were not task-ready for the self-steering approach to EE and therefore struggled. These findings seem to confirm that a one-size-fits-all model that assumes equal task readiness across entire student populations risks ineffectiveness. It also confirms the diversity of students' perceived task-readiness. For many students, stepping out of their comfort zone to learn in an existential, experiential setting that is radically different than

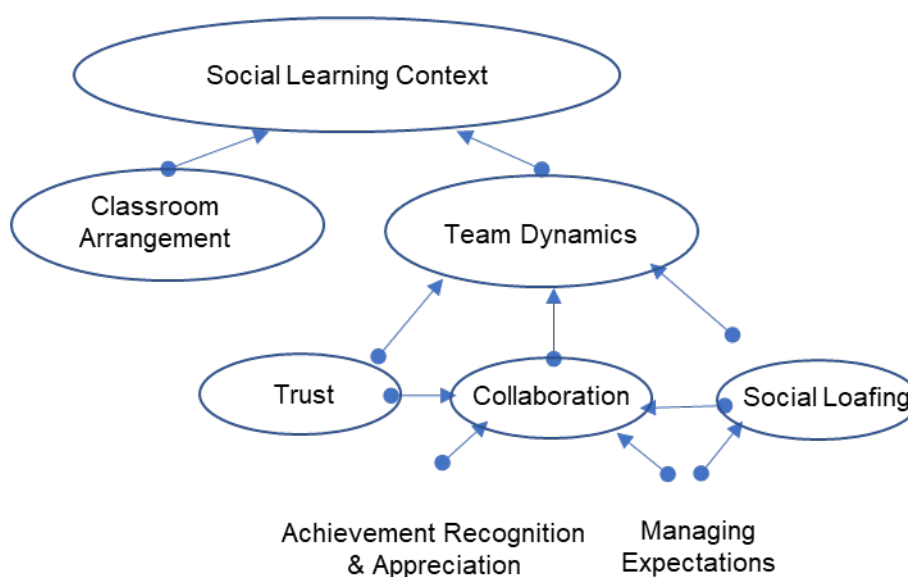
² Frequency count is number of students indicating how much they enjoyed the module, which totals to 100%; motivators and demotivators mentioned in the responses often included multiple issues, hence the percentages not counting to 100%

they are familiar with is more likely to have a negative effect on their willingness to approach challenging learning tasks if not supported by a role of the educator that matches the students' perception of being ready for the learning task.

5.3 The impact of the Social Learning Context

Whilst this research is focussed on the individual learner as the unit of analysis, learning, educational discourse highlights that learning is a process that is influenced by many factors beyond the scope of the educational system and the individual learner. One of these factors is that of the social environment in which the learning takes place. For pragmatic reasons the personal social environment of the studied population has been left out of the research scope. The focus of this research was on social elements in the learning context that lie within the influence scope of the institution; a-priori coded with i) classroom arrangement, and ii) team dynamics. Whilst the teacher/coach and assistant coach are important element in such a social context, these have been discussed in the previous section, as the role of the educator is part of the teaching/learning process and of the social learning context.

Figure 30 Social Learning Context Coding



The quantitative analysis in chapter 4 found that the modules had strongly enhanced the predictive value of autonomy, self-efficacy, and motivation for self-directed learning, yet that this relationship not always led to enhanced levels of

autonomy, self-efficacy, or motivation. This subchapter seeks to find explanations for these findings by considering the questions:

- 1) what in the social learning context influenced the students' self-efficacy and autonomous motivation for self-directed learning?
- 2) how and why did this influence the effectiveness of EE to motivate students for self-directed learning?

Table 40 Response count to motivation influencing elements Main Sample related to Social Context³

Critical Motivation affecting elements		
highly motivated (score 10-8)	Positive	Team, team work & discussions
	FREQ 128	62%
	Negative	Unbalanced team effort
	FREQ 24	38%
Moderately motivated (score 7-5)	Positive	Team, team work & discussions
	FREQ 119	47%
	Negative	Unbalanced teamwork
	FREQ 33	41%
Unmotivated (score 4-1)	Positive	Team, team work & discussions
	FREQ 3	100%
	Negative	Team work & discussions
	FREQ 9	100%

Table 40 illustrates challenges the students experienced with working in teams. During the period of this research, that challenge was increased due to the SARS-Cov-2 enforced school closing. Having started their undergraduate programme during the lockdown, the students in the VCP CCE module had not met their classmates in person on campus. Being part of an international programme meant studying with international students, most of whom had stayed in their home country, which made meeting off campus a non-option for most of the teams. All the teamwork therefore had to be conducted online. The a-priori code Classroom Arrangement was therefore replaced with SARS-Cov-2 Lockdown enforced online-setting.

³ Frequency count is number of students indicating how much they enjoyed the module, which totals to 100%; motivators and demotivators mentioned in the responses often included multiple issues, hence the percentages not counting to 100%

5.3.1 The impact of the SARS-Cov-2 Lockdown enforced online-setting

The physical context in which the intended learning is to take place proposedly determines the learner's expectations of expected behaviour. Classroom environments in which students are placed in symmetrical rows facing a teacher suggests passive learning in which knowledge is transferred from teacher to student. Classroom settings in which round tables are scattered through the room and in which various whiteboards and other physical means of collaborative creation are present suggest interaction between students and teacher (Pilling-Cormick, 1997). Education institutions specialised in providing online education try to mimic such physical settings with discussion fora, a variety of collaboration tools. Some popular collaboration tools online are for example Monday®, Miro® and Strategyzer®. For traditional higher education institutions, the focus of the teaching/learning is on campus though. For EE this is increasingly happening in dedicated start-up labs or factories; physical spaces that stimulate entrepreneurial collaboration through open space, the availability of tools and materials supporting the creative process, low barrier access to resources and staff and separate rooms for meetings.

The results of the quantitative data analysis of the influence that working online in the lockdown had on the participants' perceived level of self-efficacy and motivation for self-directed learning showed that it had significantly affected predictability of the variables as well as correlation between them. The more students struggled with the situation, the lower their perceived levels of autonomy, self-efficacy, and motivation for the learning challenges.

Due to the SARS-Cov-2 enforced school closing, the classroom consisted of MS Teams sessions. Each session was introduced by the teacher/coach with instructions for the week and followed with the student teams work collaboratively on their ideas, concepts and in the later stage their businesses in break out rooms. Collaborative creation, such as is desired in the EE modules, especially in the start-up phase when opportunities are to be sought and business concepts to be created, requires students to feel at ease. To feel free to speak their mind openly and to express their ideas and thoughts, students need to feel 'safe'. Such safety is normally provided by the buzz of the classroom, where students work in small groups within the same room and can speak freely with one or some of their team members without getting the attention of the entire class. Within the online setting, having multiple speakers at the same time was not possible, which resulted in the not so confident or outspoken students, like Henry in the prologue, to remain in the background.

Reaching out to stakeholders, one of the difficulties mentioned in the free response items of the mid- and end term surveys, was complicated by not being able to walk up to people who seemed to fit the profile of potential customers and informally chat with them. That students and teachers encountered difficulty with the online situation is illustrated with the following extracts from the two focus group discussions:

“We struggled with being online in this course, because running a company, especially as you need to do A to Z, is really difficult. It would be easier if you can have people there [physically present] that you can bounce ideas off, doing it quickly and spontaneously, instead of having to schedule a zoom or MS Teams meeting or putting it out in a Whatsapp group. So especially with this course I am struggling with the online-bit pretty badly”. (SFGP3)

“I have struggled with creating an entrepreneurial vibe in the digital classroom. Getting the students to proactively take part in discussions felt like pulling a horde of dead horses from the water”. (TFG TZW)

This section seems to confirm the importance of a learning context that are comfortable, attractive and conducive to the learning activity, for sharing insights, collaborative creation and relaxing (Hammond and Collins, 2990; Pilling-Cormick, 1997). When shifting to online learning settings, these findings confirm the need for ease of use, accessibility, and particularly the proper facilitation of collaboration (Kop and Fournier, 2010; Conradie, 2014).

5.3.2 Team Dynamics

The second a-priori code in the social learning context is that of team dynamics. At the end of the first block in the VCP CCE Module, as explained in section 3.2, only 2 or 3 of the 6 or 7 business concepts proceed to actual venture start-up. This means that 4 or 5 business concepts are discarded, and their team members reallocated. Analysis of the qualitative data shows that this situation puts extra challenge on team dynamics. The discussion transcripts and the free response items related to team dynamics produced 5 lower-order codes; i) trust, ii) collaboration, iii) social loafing, iv) achievement recognition and appreciation, and v) managing expectations.

5.3.2.1 Trust & Collaboration

For teams to collaborate effectively, the discourse identified trust as being fundamental. To stimulate team engagement and performance of individual students in the learning activities, some of the participants in the focus group discussion explained how they experienced the importance of having open discussions about needs and expectations. In the discussion, the students explain how they had approached

apparently unmotivated and/or non-performing students with a genuine interest in what these individuals might be struggling with and showing understanding that what was going in their personal life might affect their participation in the project. Responses from the open question surveys illustrate the struggle that students had and how being able to share these with their teams helped them progress:

"I feared stepping outside my comfort zone and this really held me back from my full potential. I talked about it with my team and the motivated me to step outside of it. I believe that talking about it is the best thing you could do, so I did good" (FRI 12).

"What I enjoy most is the understanding in our team. We listen to each other and when there is a problem no one acts immaturity. If something needs to be said, we say it and we can be truthful with each other."(FRI 16)

In the student focus group, they shared experiencing that student would change their behaviour once they felt recognition for their personal circumstances and/or when they were given the freedom to work on tasks that they preferred instead of being told what to do. To get people to speak freely about what negatively affected them, reflecting on the learning tasks and activities, their own levels of knowledge and performance, to reach out if they needed support, focus group participants confirmed the essence of trust. Creating a culture of trust facilitates openness to discuss personal learning challenges, which, as discussed in the discourse, requires students to be confronted with an individual learning need and then being given the freedom to pursue learning goals to close the learning gap. To acknowledge a learning need, which may differ from that of others in the team, requires a climate in which there is appreciation for difference and tolerance of failure (Long, 2000; Caffarella, 1993). Extracts from the students' discussion explain what they did to increase levels of engagement and initiative from team members:

"Getting to know the people in the team and giving them a non-threatening environment to share their experiences, ideas, opinions and frustrations" (SFGP1).

"Not judging immediately but being empathic and showing genuine care" (SFGP2).

"knowing one's (own and each other's) strengths and weaknesses, and goals and objectives" (SFGP7).

Realising that working in the online situation was demanding, more so for some than for others, some of the participants discussed how they themselves set the example by showing their own vulnerability, creating space for others to feel comfortable sharing their griefs.

These shared experiences confirm the importance of creating a culture of trust and openness for students to feel free to express themselves and collaborate. It also emphasises the importance of a team culture that is supportive, in which there is tolerance for failure and recognition of difference. Collaboration, as the discourse predicted, requires a 'safe' environment, that is appreciative and understanding of students' discomforts, in which learning needs can be shared, and learning goals can be realised in collaboration with others. The team members become each other's role models. How much so is illustrated in the following extract from the teacher's focus group discussion:

"In one of my teams, two of the male students were experienced with conducting subscription sales. The two girls in the team were quite anxious about reaching out to companies. The two guys who were already very experienced with sales took a coaching role over the girls. They managed to bring out the best in each other and they managed to turn this project into a huge success. It was such a great experience to see how this team trusted each other and was willing to help each other and with such degree of 'safety' within the team that the girls could express their anxiety and share their discouragement when they experienced rejection or counter arguments to which they had no answer." (TFG IDB).

Without trust and openness in the team, the above illustrated situation could have seen the two girls avoiding the learning task of reaching out to external stakeholders to validate the assumptions made in the creation of the business concept and in the realisation of the business, fearing failure. Without a climate in which such concerns can be shared, students tend to either focus on what they do feel ready to achieve or procrastinate on the task at hand, which may be experienced as social loafing by the other team members.

5.3.2.2 Social Loafing & Collaboration

Social loafing, or free riding, is the perceived unwillingness of some to put in the necessary effort for the team to succeed, usually the result of either lack of motivation or lack of self-efficacy. Reading through the free response items of the end-term surveys, this is one of the most frequently mentioned factors. It is also the topic of a heated discussion in the student focus group discussion, which reveals how unbalanced team efforts tend to pull down the motivation of students. Teachers and students report having negative experiences with students who were not motivated, some of whom dropped out of the IB programme later in the semester. Many negative comments complain about the lack of effort or quality work provided by team members, which is illustrated by responses such as:

“I did not like anything in the project, because it was not possible to do it individually” (FRI 134)

“The teamwork is really upsetting sometimes and because we are bound to the same team for an entire semester, this does take away some of the enjoyability of the course for me” (FRI 131).

Social loafing has different causes though. Most people tend to label it as unwillingness to participate in the team efforts, whilst its causes are often overlooked. Motivation theory explains that for students to thrive in challenging learning settings, they need to feel supported to make their own choices regarding activities and goals, feel effective and capable to achieve their goals, and feel closely related to others in the learning environment (Reeve, 2002) When one of these criteria is not met, students may withdraw from the learning activity, losing their achievement motivation (Deci and Ryan, 2000). Reading through the responses of the students, it becomes evident that there is a variation in what students expect of one another and how this affects others, which is illustrated in the following extracts:

“I am someone who tries really hard with things I like, and I put a lot of effort in it. That is some of the most common feedback I get as something the team finds difficult. When they try to do something, they are always wondering if it is good enough.” (SFG P1)

“what I did was never good enough, [...] would always rewrite my parts” (FRI147)

A difference between effective and non-effective teams may be explained by the way that student teams take responsibility for overall performance and how they manage each other. Some student-team captains reported to struggle with motivating fellow students. The different tactics they had tried to stimulate student engagement were discussed. Tactics varied from highly directive, such as threatening to dismiss non-performing students from the project, to highly autonomous, such as giving people full freedom to do what they wanted. The best practices shared in the focus group sessions about team motivation resulted in a better understanding of how managing team dynamics can optimise engagement and enthusiasm, as will be discussed in the following section.

5.3.2.3 Team management style

What seems to make the difference between the samples in this regard is that the VCP CCE operates as a real-life company in which real-life consequences of (non-)performance are experienced and real-life rules apply. Operating in a real-world context brings the learning project to life, as was discussed in section 5.2. Within this

real-life context, the appointed student-venture management team takes on the responsibility for engaging the student team. This decreases the teacher-student hierarchy and seems to be effective for enhancing the team dynamics.

How the teams are managed by the participants appeared to have had a noticeably different impact on how students acted and performed, which corresponds with what is theorised about motivation in the self-determination and self-directed learning theory. Teams that managed to develop a team spirit of shared enthusiasm for what they were trying to accomplish, in which the team believed in the value they were creating with their company, and those who had experienced success, reported to have fewer issues with free-riding behaviour. In teams where that shared team spirit is absent there is much more friction between students. Participants in the focus group session who reported to have managed their teams in a more traditional, transactional style, dividing the tasks and determining what the other students in the teams were supposed to do, had trouble motivating the team members, whereas those that applied a more transformational leading style, avoiding directiveness, experienced higher levels of engagement and enthusiasm. This theme is illustrated by the following extracts from the focus group discussion among the students:

“the more I tried to manage the team, the harder I tried to get my people to do what I wanted them to do, the less they did.” (SFGP2)

“what helped was discussing with the team what the objective was for the week and then letting the team decide what they wanted to do to achieve the goals.” (SFGP5)

“when I gave people more responsibility, they got more engaged and felt more motivated.” (SFGP6)

5.3.2.4 Managing expectations

The above results illustrate that trust requires management of expectations and that poorly managed expectations tend to lead to demotivation and social loafing, hindering effective collaboration. Variation in team effectiveness may be explained by the manner that expectations are being managed, with acceptance or acknowledgement of differences in study ambitions and achievement capabilities between students. Teams that managed expectations from the start, seemed to have used the diversity to their advantage instead of letting it negatively affect them. By discussing together what their expectations were, what they were aiming from and how they could support each other in achieving those goals seemed to encounter less difficulty. This theme is clearly illustrated with the following two extracts from the focus group discussion:

“How well we want to do with our companies, with our ambitions for this course, is different with other people, and that causes a gap” (SFGP1).

“How someone measures success is a big indicator of how well you will work with them. For some people getting a passing grade, is a huge success, whereas there are other people who would settle for nothing less than an honours award. When you work with such a mixture of people, who measure success differently, I think it is important to find the balance where that success translates to everybody and not just caters to one person’s needs because it is a group scenario, it is not an individual project. And then finding a way to deal with for example someone who is falling far below the group’s definition of agreed success, try to find a way to get them to meet that level consistently I think is very key to success in this [entrepreneurial] environment” (SFGP4).

Some students, the participants agreed, need clear and specific instruction than others. Understanding that people are motivated differently and catering for that difference is what seems to have made the difference for them in achieving enhanced student engagement, as illustrated in the following extract:

“I dislike it very strongly if I am being told what to do and how to do it exactly. I like to know where I need to get to and I want to figure it out myself. For some people in my company, it is the complete opposite, so my coach encouraged me to sit down with some of them. That felt very contrary to what I normally do, but I sat down with them and discussed with them “so what needs to be done” and if that is what you want to do, then this is how you should get there, and give them clear instructions. That’s when we started working with Clockify®, so that people could clock their hours, because that is what they liked, to be held accountable. And that is super contrary to how I like to operate.” (SFGP1)

The main lessons learned from the students’ experiences in how to stimulate students to engage in challenging the team efforts is to create a culture of trust, that recognises and appreciates differences amongst learners, and which is supportive for the students to express their learning needs and explore ways to achieve their and the team’s learning goals.

5.3.2.5 Achievement recognition

Besides trust and openness for sharing of needs and desires, the element of achievement recognition and appreciation is mentioned as a success factor in enhancing engagement and collaboration in the participants’ teams. Like the situation sketched in the prologue of this thesis, when students experience dominance of one or some students who seem to be relatively more confident and/or knowledgeable, they might withdraw. This does not mean that they are less motivated or enthusiastic about the project, but they do not express it in the meetings that are dominated by the outspokenness of the significant other(s). The following extract illustrates this:

“To get everyone in the team to feel equally appreciated, we picked one person at a time and they would receive a compliment, based off of either his/her personality

or something we have learned from them since we've started the company, and it was maximised at 3 comments, which kept it nice and short" (SFGP1).

Receiving personal feedback and compliments from peers, based on something they have worked on was described as motivating, stimulating, empowering and encouraging, which corresponds with the discourse that claims that verbal persuasion is one of the four key sources of self-efficacy (Bandura, 1977). That this does not work for everyone, especially for performance-oriented students whose motivation is not related to the success of the company but to the credits (or grades) to be obtained, is illustrated in the examples given by the participants in the focus group discussion:

"It is my experience that people who are not really motivated tend to do just the bare minimum and when they receive a compliment for that work done, they feel it is indeed sufficient." (SFGP3)

5.4 Summary

This chapter presented the findings from the qualitative data analysis, providing explanatory insights in how entrepreneurship education contributes to preparing students for self-directed (lifelong) learning readiness. It provided insight in which elements in the teaching learning process and the social learning environment affected the students' process of learning transformation. The chapter identified key explanations for the significantly moderating influence of EE on the strengthened relation between the learner characteristics and self-directed learning readiness. Within the teaching-learning process, being tasked to perform learning tasks in the authentic context of starting and running, or advising a business in a real-world setting, seems to explain the enhanced levels of autonomous motivation by means of sensing ownership and responsibility for the performance level of the learning tasks. Experiencing success or failure in achieving learning tasks, through the immediate feedback gained from stakeholders in the authentic setting, seems to explain the substantial predictive value of self-efficacy for self-directed learning readiness. The findings also seem to confirm the important role of the educator in the teaching-learning process, by gradually building self-perceived task-readiness through the application of a hierarchical competence development process.

Within the social learning context, the findings indicate the importance of collaborative team dynamics, emphasising the essence of trust, openness, balanced expectations and a team management style that honours such values.

In the following chapter these findings are integrated and interpreted in a more abstract discussion, to gain the sought after understanding of how students experience learning in EE, how this influences their willingness to pursue learning opportunities, and what that means for the design and evaluation of EE.

6 Discussion

Introduction

In this chapter the results of the quantitative and the qualitative data analyses are triangulated more accurately to explain the relation between autonomy, self-efficacy, motivation for self-directed learning and the influences from the teaching-learning process and the social learning context on that relationship. The chapter starts with a summary of the research, from intention through the literature review to the research choices made, data collected and analysed (6.1). In section 6.2 the results are further interpreted to answer the question 'how did students experience learning in the studied EE modules? And 'how did this affect their willingness to pursue learning opportunities. Section 6.3 discusses why the results vary between students, and what this means for the design and evaluation of EE learning activities.

6.1 Summary of the research

Looking back at the start of this research process, it originated from my concern about experiencing increased risk-avoidance amongst students and about the growing gap between the skills that (business) graduates obtain from their study and those that are demanded in the dynamic labour market. A trend that was found to be the effect of the rapidly decreasing half-life of knowledge (Siemens, 2005; Downes, 2009) and skill (LaPrade *et al.*, 2019) as the emergence of knowledge proliferates thanks to the digitisation of the knowledge economy. My concern that we do not sufficiently prepare our graduates to be flexible, self-directed, and able and willing to continuously invest in their own professional development was found to be broadly shared by academia and education practitioners (AACSB, 2018, Chamorro-Premuzic and Frankiewicz, 2019; Mulcahy, 2019; OECD, 2020). Discovering that entrepreneurship, my own field of expertise, is promoted vigorously around the world, and increasingly as a 21st century employability skill (Wilson, 2008; European Commission, 2021, 2018, EU, 2019), and that it is rapidly gaining presence in school curricula without really understanding how it is or can be made effective (Fayolle, Verzat and Wapshott, 2016; Mwasalwiba, 2010) for the different purposes for which it intends to educate (Kamovich and Foss, 2017), triggered me to embark on this doctoral research journey.

To generate a deeper understanding of the potential effectiveness of entrepreneurship education for preparing students for the dynamic labour market, I chose to approach it from an educational science perspective, specifically focusing on its effect on learning skills that would benefit graduates to adapt to the fast and frequent

changes in skill and knowledge demands they are so likely to encounter. The theoretical framework that presented the most logical fit for studying the relation between education and learning skills, and between learning skills and adaptability and flexibility for future employability was that of self-directed learning. Self-directed learning is defined as: *“a process in which individuals take the initiative, with or without the help of others, to diagnose their learning needs, formulate learning goals, identify resources for learning, select and implement learning strategies, and evaluate learning outcomes”* (Knowles, 1975, p.18).

An abundance of knowledge was found to be available about learning skills and characteristics of self-directed learners (Guglielmino, 1977; Kasworm, 1983, Oddi, 1986, Brockett & Hiemstra, 1991; Stockdale and Brockett, 2011) and about how and why elements in a teaching-learning process (Spear and Mocker, 1984, Candy, 1991, Brookfields 1986, Garrison, 1997, Hase and Kenyon, 2000) and the social learning context (Merriam, Caffarella and Baumgartner, 2007; Condradie, 2014; Morris and König, 2020; Hiemstra, 2009; Hammond and Collins, 1990, Pilling-Cormick, 1997) would affect maturation of self-directed learning skills and characteristics.

From this abundance of knowledge about self-directed learning, I developed a conceptual framework for understanding i) how to recognise student behaviours that indicate self-directed learning readiness, ii) what educational practices can cultivate self-directed learning skills, and iii) how learning behaviour and self-directed learning readiness are affected by the social environment in which the learning takes place. The conceptual framework served as my theoretical guide through the research process as I evaluated the entrepreneurship education modules taught at my university.

This process aided my recognition and understanding of good practices in entrepreneurship education in relation to enhancing self-directed learning readiness. The result of such deeper understanding is that it will benefit the practice of developing and evaluating EE that aims to prepare its students for self-directed lifelong learning, such as advocated by the European Commission in its COSME 2020-2023 funding scheme (European Commission, 2021). Taking this deductive research approach that is grounded in a well-established educational theory also enabled me to contribute to the entrepreneurship education literature, by providing deeper embedment of the evaluation of EE efficacy in educational science.

Because the purpose of the research was two-fold, i) to verify the research proposition that EE positively influences SDLR, and ii) to understand its dynamics, a mixed methods approach was necessary. Within the extant body of knowledge, no

confirmation of this relationship was found, which implicated that quantitative research was needed to answer the question if and to what degree entrepreneurship education enhances self-directed learning readiness. A void was discovered in the EE literature that indicated a need for more fine-grained understanding of how students experience learning in EE and how that influences their willingness to pursue learning opportunities. This void, or problem, in the EE literature aligned seamlessly with the objective of this research and implicated the need for adding explanatory qualitative research.

Because the research converges EE with educational theory and SDL theory, the available assessment frameworks used within these separate fields of science were only partly applicable. I therefore developed a unique assessment tool that drew elements from the most common frameworks within each field. From the field of SDLR, I used elements reflective of learner characteristics from the Self-Directed Learning Readiness Scale (SDLRS) (Guglielmino, 2021), which tends to focus predominantly on adult learning. From the Personal Responsibility Orientation-Self-Directed Learning Scale (PRO-SDLS) (Stockdale and Brockett, 2011) elements were borrowed that reflect learner behaviour within the context of formal education and how these reveal various maturity levels of self-directed learning readiness. These SDL factors were combined with behavioural indicators of entrepreneurial competence drawn from the EntreComp Framework (Bacigalupo *et al.*, 2016), as these behaviours could be verified in the EE modules. The resulting 22-question 5-point Guttman scale questionnaire allowed me to profile student's self-perceived levels of autonomy, self-efficacy, and motivation and how this was reflected in self-directed learning readiness.

The main question this research sought to answer was "How can entrepreneurship education contribute to preparing students for self-directed (lifelong) learning readiness?" The conceptual framework led to three hypotheses, for which it sought explanation:

- H1 autonomy and self-efficacy predict motivation for learning
- H2 autonomy, self-efficacy and motivation predict self-directed learning readiness,
- H3 entrepreneurship education pedagogies moderate the predictive value of autonomy, self-efficacy, motivation for self-directed learning readiness with varying degrees, favouring the stage-wise, mixed pedagogical approach.

Using the self-assessment survey questionnaire to measure students' perceived levels of autonomy, self-efficacy and motivation and the predictive value of these variables for self-directed learning characteristics before and after their

involvement in the EE module allowed for comparison to establish occurrence of and the degree of predictive value of these variables and how these varied between the two sequences. Using the template analysis that addressed the same concepts as the survey allowed for deriving explanations for the results and variations found.

The findings for each of these hypotheses are discussed in the following subsections, integrating the quantitative and the qualitative results to gain an enhanced understanding of the phenomena found.

6.2 Integration and Discussion of the Findings

How does entrepreneurship education contribute to preparing students for self-directed (lifelong) learning readiness?

H1+H2 examined the degree to which the independent variables predicted motivation for learning and self-directed learning readiness respectively, controlling for the propositions that were derived from the literature. H3 examined the moderating effect of entrepreneurship education pedagogies on the identified relationship between autonomy, self-efficacy, motivation, and self-directed learning readiness. In this subsection the results are discussed per hypothesis.

6.2.1 Evaluation of relationship between the independent variables

H1 evaluated the predictive value of autonomy and self-efficacy for the participants' motivation to engage in challenging new learning situations. Among higher education students, an overall decrease of risk propensity and tolerance for ambiguity has been observed among students, which has been ascribed to the educational system lagging in adopting more constructivist learning approaches (Giddings, 2015; Conradie, 2014). Education, some scholars argue, is geared more towards preparing learners for passing exams than towards enhancing independent, self-directed lifelong learning (Morris, 2019; Levy, 2018; Giddings, 2015; Rideout and Gray, 2013; Boyer *et al*, 2014, Guglielmino, 2013).

Having been motivated predominantly by the external pressure of grades, in other words being educated to be performance-based learners (Eccles, 2005; Wigfield *et al*, 2006; Wigfield & Eccles, 2002), it is no surprise that students, when they enrol in undergraduate education, might experience tension or anxiety to start and run a (student) company as part of their obligatory study programme. The review of the EE

literature revealed that a divide exists between students thriving and students struggling in experiential learning programmes such as those applied in the contemporary VCPs (Oosterbeek and Van Praag, 2010), especially when such study programmes are a substantial part of an obligatory study programme. It explained the experienced increase of students' dependency on instruction and guidance, especially in the entrepreneurship modules that apply a radically different approach to teaching and learning than what students are familiar with.

The proposition of this research, that learning programmes should accommodate students to feel self-efficacious to be autonomously motivated, was supported by the findings in the educational literature. Theory of motivation explains how learners' perceived level of task-related self-confidence and autonomy, combined with a matching level of experienced support from others (Deci & Ryan, 2000; Deci *et al*, 1991) predict type and level of motivation to approach challenging learning goals. For students to act autonomously in challenging learning situations, this body of knowledge contends, they need to perceive themselves to be situationally competent. The degree of perceived situational competence, or task-readiness, relates to students' attitude towards entering a learning task (Bandura and Cervone, 1986). The theory states that lower levels of perceived task-readiness predict failure-avoidant behaviour. This suggests that students will avoid what they perceive to be high-risk learning situations, motivated to do what needs to be done by the external pressure of obtaining a passing grade (Ryan and Deci, 1991). Lower levels of perceived self-efficacy relate to higher instructor dependent behaviour (Pintrich and Schunk, 2002), such as students asking how to perform a learning task to obtain a certain grade. On the other hand, higher levels of perceived task-readiness would lead to students pursuing more challenging goals (Eccles, 2005; Wigfield *et al*, 2006; Wigfield & Eccles, 2002). The literature indicated that students' motivation to work hard, persevere when things don't go as planned, deal with ambiguity and setbacks, and pursue challenging goals, is grounded in the students' degree of self-efficacy. The results of the quantitative as well as those of the qualitative surveys confirm this. Self-efficacy proved to be a statistically significant predictor of motivation at $p < .001$ with an effect size $> 30\%$ ($\beta .303$). Because the relationship between self-efficacy and motivation strengthened from not significant pre-intervention ($\beta .004$) to statistically significant post-intervention ($\beta .303$), explanation for this relationship is sought and found in the students' experience of learning in the EE modules.

The observation that participation in EE contributed to students' self-efficacy and that this enhanced their motivation for engaging in its learning activities is

supported by the findings that the number of students indicating a more approaching goal-achievement orientation increased from 53% prior to participation in EE to 70% upon its completion. Of the 32% of the respondents could be categorised as “uncertain” about their goal-achievement orientation (neither approaching, nor avoiding), >50% seemed to have taken a more “approaching orientation” towards the learning challenge upon completion of the module, against 19% indicating to be more “task avoidant”, and 28% remain in the category “uncertain”. The research found a strong increase in the number of respondents who could be categorised as “tolerant of failure” (from 27% of the respondents prior to participating in the EE module, to 69% upon its completion). Where 42% of respondents were ‘sitting on the fence’ at the start of the EE intervention only 13% remained uncertain upon its completion, And of the 31% respondents having indicated to “not be tolerant of failure”, only 13% remained in this category upon completion.

Strong enhancements have been found in students’ confidence to speak freely (from 53% passive against 33% proactive pre-intervention, to 18% passive and 66% proactively sharing opinions and ideas post-intervention) and to reach out to stakeholders (from 13% confident to talk to strangers at the start of the EE modules to 41% upon its completion). Self-efficacy was found to correlate strongly ($r = .602$, $p < .001$) with their enthusiasm for the module and with their independence and motivation for the learning tasks ($r = .586$, $p < .001$). Explanation for the indicated enhancement of confidence and motivation, from the perspective of the learning experience in the EE modules is discussed in subsection 6.2.3.

6.2.2 Evaluation of relationship between the independent variables and SDLR

H2 controlled for the proposition brought forward by the SDL literature review that self-directed learning readiness is determined by students’ maturity levels of self-efficacy, autonomy, and motivation. The research hypothesised that maturity levels of autonomy, self-efficacy and motivation for learning would predict students’ ability and willingness to take control independently and proactively over their learning tasks, initiate, plan, and manage whatever is needed to achieve their learning goals. Self-perceived levels of task-related autonomy, self-efficacy and motivation to approach challenging new learning tasks was theorised to predict self-directed learning readiness. The results of the multiple and the simple linear regression analyses have confirmed this. Statistically significant relationships were found between autonomy and SDLR ($\beta .294^{***}$), self-efficacy and SDLR ($\beta .294^{***}$), and motivation and SDLR

(β .406***), and between the combination of these independent variables and SDLR ($R^2 = .610$, F 62,67***). These results illustrate that maturity levels of the learner characteristics predicted the participants' learning behaviour, reflective of self-directed learning readiness.

Studies discussing characteristics of self-directed learners mention task orientation, clear goal setting, and the planning, management, and monitoring of personal learning processes to achieve the formulated learning goals (Grow, 1991; Garrison, 1997). Self-directed learners are also described as learners who can cope with ambiguity (Stockdale & Brockett, 2011), who are willing and able to motivate and activate themselves, to search for and evaluate new approaches, and to work autonomously (Guglielmino, 1997; Long & Agyekum, 1983; Oddi, 1986; Brockett & Hiemstra, 1991; Garisson, 1997; Gibbons, 2002).

The survey used in this research to assess students' self-directed learning readiness used the above-mentioned behavioural indicators of self-directed learning readiness and their predictive learning characteristics. It distinguished between five levels of maturity that reflect degree of self-perceived autonomy, self-efficacy, and motivation for engaging in the learning activities, and five maturity levels of the behaviours that reflect self-directed learning readiness. The results of the bivariate Pearson Correlation tests between the variables and the individual learner behaviours confirmed that self-directed learning readiness strongly ($r > .70$) correlates with i) identifying learning needs ($r = .719$, $p < .001$), ii) dealing with ambiguity ($r = .722$, $p < .001$), and iii) autonomous motivation to initiate and manage new learning challenges ($r = .828$, $p < .001$). The results confirmed that self-efficacy strongly relates to students' willingness to approach high risk learning tasks ($r = .719$, $p < .001$) and their (intrinsic) motivation to exploit new learning challenges ($r = .510$, $p < .001$). Autonomy proved to correlate moderately strongly with students' resourcefulness to obtain and manage resources needed to succeed in learning ($r = .644$, $p < .001$). Overall, the findings of the research confirm the hypothesis that the learner characteristics identified in the conceptual framework are predictive for students' ability and willingness to self-direct their learning. The findings provide evidence that the behaviours identified in the SDL literature can be applied in the context of undergraduate business education besides that of adult education.

6.2.3 Impact of the EE Teaching-Learning Process

H3 examines the key propositions that underly this doctoral research, which was to determine if and to what degree various pedagogical approaches to EE enhance self-directed learning readiness. The key assumption underlying this hypothesis was that most lessons about preparing undergraduate students for self-directed learning readiness could be learned from a stage-wise, mixed pedagogical approach to learning in EE (taking students at their own pace through the stages of 1) familiarisation with entrepreneurial knowledge and skill, through 2) recognition of how the acquired knowledge is applied in real life situation, and 3) practicing with knowledge and skills required to achieve entrepreneurial results within the safe environment of the classroom, to 4) the transformational learning experience of applying the newly acquired knowledge and skills in the authentic setting of the venture creation process).

The literature review revealed such a diversity of studies evaluating effectiveness of EE courses, that no reliable answer can be provided to these propositions, nor to the question how to teach EE for the purpose of enhancing self-direction. In response to the concerns raised about how the myriad of pedagogical forms applied in EE has affected the generalisability of its efficacy evaluation (Fayolle, Verzat and Wapshott, 2016), and about the lack of academic rigour (Longva and Foss, 2018; Piperopoulos and Dimov, 2015; Jensen and Calvert, 2014; Mwasalwiba, 2010), I chose to focus this research on a case study that represents the Junior Achievement's Young Enterprise Student Venture Creation Project, which is acknowledged as the most broadly taught entrepreneurship education programme in the world (Lackéus and Blenker, 2021).

Based on the analysis of the projects' documentation, the various learning tasks were categorised, applying the teaching model framework introduced by Fayolle and Gailly (2008) and in alignment with Aadland and Aaboen's (2018) proposed typologies of teaching-learning: passive, participative and self-driven. The pedagogical approaches were further defined with the theoretical alignment propositions of Robinson *et al.* (2016), Macht and Ball (2016) and Bell and Bell (2020). Integrating these elements to answer the question 'how to teach EE?', the proposed approach to organising teaching practices in EE might then be as shown in table 41 (on the next page). Each of these categories individually represent benefits and risks for the development of self-directed learning readiness when considered as separate approaches within a module, as discussed in chapter 2.3, and studied in this research.

Table 41 Proposed Operationalisation of Teaching Model Framework for a stage-wise, iterative approach to learning to be(come) Self-Directed Learning Ready

Undergraduate students in formal (business) higher education					
Self-Directed Lifelong Learning Competence development in International Business					
Who for: Audience	For which results: ILOs	What: Content	How: Pedagogical Methods	Why: Learning Objectives	Teacher Role
					Assessment
Stage 1 - Familiarisation: Passive Learning (About) Entrepreneurship (Teacher-directed learning)		Classroom based generation of theoretical understanding of theme, topic, method and tool	Lectures, Direct instruction, Modelling (Guest lectures)	Scaffolding knowledge to frame what is to be learned Developing cognitive framework to understand what and how knowledge about entrepreneurial topics, methods and tools are applied in real-life settings	Oral or Written test; Explanation
Stage 2 - Recognition: Participative Learning (About) Entrepreneurship (Teacher Moderated, Peer-directed learning)		Classroom based recognition of theoretical application in authentic settings	Tutorials,, Case studies, company visits, feasibility studies and research projects	Recognition of application in authentic settings, Learning how knowledge is applied Build Self-efficacy	Debate, Presentation, Business Plan competition, Feasibility study, Research paper
Stage 3 - Practicing Application: Participative Learning (In & For) Entrepreneurship (Peer-directed learning)		Classroom based application of topics, methods and tools	Workshops, role play, simulations, competitions	Progressive skill development to enhance autonomous motivation	Organiser, Coach, Facilitator, Resource consultant Plan of approach to application, pitch
Stage 4 - Experiencing Application: Existential Self-Driven Learning (Through) Entrepreneurship (Peer- and Self-directed learning)		Real-world experience with application of topics, methods and tools and Reflection	Authentic venture and/or value creation project tasks, Student based consulting programmes	Learning from experiencing consequences of actions and choices. Collaborative creation of value in confrontation with and application of required knowledge and skills. Discovery and pursuit of personal learning needs and goals.	Supervisor, Facilitator, Resource consultant, Participant Reflection, Portfolio

Comparison of the two time-sequenced data sets from 2021 resulted in confirmation of the proposed relationship between the variables, as predicted by the SDL literature and the educational science literature. The results suggest that the observed variation could indeed be explained as being the moderating effect of the respective EE modules followed by the participants.

Entrepreneurship education, the EE literature explains, gradually shifted from passive learning *about* entrepreneurship towards more learner-centred pedagogy (Hagg and Gabrielsson, 2019), in which existential, contextualised learning approaches take an increasingly dominant role “*to provide the opportunity for students to participate in real-life situations and activities outside the program*” (Kauffman Foundation, 2015, p.36). How students experience learning in EE and how this might encourage them to pursue personal learning opportunities is still a question though, suggesting that the pedagogical development may be the results of pioneering instead of thoroughly considered educational grounding. This was confirmed by Béchard and Grégoire (2005), Fayolle and Gailly (2008), and Robinson *et al* (2016). The latter proposed a sequential, stage-wise approach to learning that starts with behaviourist knowledge transfer and moves through social and situated learning towards existential learning. More recently Bell and Bell (2020) applied this concept in their proposed framework for experiential learning, emphasising the need for teaching foundational knowledge prior to its application in an authentic situation.

The SDL literature conceptualises contextual learning as the purposeful organisation of circumstances within the learning context (Spear and Mocker, 1984) that provide an attractive yet challenging new situation to students, that triggers recognition of a development need and a desire or sense of urgency to fulfil the learning requirements (Moore, 1980; Brookfield, 1985, Gibbons, 2002). It contends that learning in contextualised settings in which subject matter content is related to real-world situations, motivates students to make connections between knowledge and its application in such real-world settings (Candy, 1991; Danis, 1992) and stimulates active participation in a learning activity when students find the activity relevant and engaging (Briner, 1999).

Macht and Ball's (2016) suggestion to emphasise the importance of the authenticity of the teaching-learning setting aligns with this view, for which Robinson *et al*. (2016) propose the introduction of radically different approach to learning. Learning settings, these scholars propose, should accommodate existential, transformational learning to transform learners into entrepreneurial, self-directed lifelong learners. Such

existential learning situations should represent the authentic professional field for which the students are educated and should facilitate authentic experience of the consequences of choices made in conducting the learning activities. It is in these environments, the theory indicated, that students become aware of their learning needs and are stimulated to act upon these.

Confirmation is found in the results that the contextualised approach as applied in the two EE modules studied indeed stimulated higher levels of engagement (approx. 72% of motivation enhancing responses categorised with contextualised learning) and students taking a more leading and proactive role in their learning process. The enhancement of motivation is theorised and confirmed in the research findings as being the result of feeling ownership and responsibility for the learning activities as they take place in the context of real-world entrepreneurship and is very strongly related to self-efficacy. Because the venture creation programme is not a simulated, hypothetical exercise but challenges students to bring the knowledge and skills gained inside the classroom into real-world settings, they tend to feel more responsible for the results of their learning activities, as these have tangible effects.

Comparison of the pre-intervention survey results with the post-intervention survey results confirms that the existential, contextualised approach to EE not only affected motivation but had a highly significant impact on the relation between the variables, seeing the combined predictive value of autonomy, self-efficacy and motivation for self-directed learning readiness increase from 21% (R^2 .210, F 16.97) to more than 60% (R^2 .610***, F 62.67). The results of the quantitative analysis showed that this substantive increase was mainly the effect of the strengthening of the self-efficacy – self-directed learning relation (from β .196***, R^2 .04, F 15.52*** pre- to β .694***, R^2 .48, F 227.32*** post-intervention). The relationship between autonomy and self-directed learning readiness had gained strength (from β .087, R^2 .005, F 2.98 to β .294***, R^2 .08, F 23.18***) as a result of the EE intervention. Reinforcement for these findings was found in the focus group discussions and the responses to the open question surveys, where students emphasised the impact of experiencing success or lack thereof on their willingness to conduct learning activities within and beyond the scope of the modules' learning objectives.

Against these results, motivation had stayed relatively behind (from β .396***, R^2 .155, F 72.39*** pre- to β .406***, R^2 .161, F 48.35*** post-intervention), which was reason for an additional question to be addressed: What influenced motivation that was not accounted for in the original research questions? The results showed the strong

influence that the SARS-Cov-2 lockdown enforced online learning situation has had on students experience of the EE modules.

6.2.4 Impact of the SARS-Cov-2 Lockdown

The free response items in the open-question surveys showed frequent mention of the forced online classroom as a negative experience. The timing of the data collection coincided with the SARS-Cov-2 imposed lockdown of society and the consequential closing of schools and businesses. This reinforced the quantitative findings where multiple linear regression analyses and bivariate correlation tests that assessed if and to what degree the lockdown had affected students' motivation. The results of these illustrated that how students dealt with the lockdown situation was a statistically significant predictor for self-directed learning readiness ($\beta.393, p < .001$) and self-efficacy ($\beta.613, p < .001$), and was strongly correlated with motivation ($r=.385, p = .001$). These findings confirm that motivation was affected by the students' emotional state as a result of the Covid situation. Explanations given for the negative pressure of the lockdown on students' motivation includes difficulties they encountered in getting in contact with relevant stakeholders for their student venture.

Relationships with potential customers and suppliers were hard to establish, businesses were closed, and contact persons could not be reached as they were not in the office, suppliers within and outside the country faced delivery problems, hindering the student venture's start-up process as the obligatory liquidation date approached. Students struggled with collecting valuable first-hand information from stakeholders, for which, under normal circumstances, informal chats would be initiated. Having to work from home and unable to meet people spontaneously meant that students had to resort to formally scheduled talks instead, taking away the informality and pushing up boundaries. Students also struggled with the lack of personal contact with peers and teachers, with speaking up in an online class-gathering and with motivating themselves to switch into an 'entrepreneur modus' while locked at home or a student dorm shared with multiple others.

The remarkable enhancement of self-efficacy and its relation to self-directed learning readiness seems to also be affected by the lockdown situation. The strong correlation between dealing with the lockdown and self-efficacy ($r = .61, p < .001$) indicates that students become more self-directed as they feel more confident, but it also indicates the opposite, that students become less self-directed as they feel less confident. This is confirmed with its nearly standard normal distribution ($M = -.11, SD$

1.07). The data from the focus group discussions and the responses in the open question surveys explains that the enhanced impact on self-efficacy could be related to the experience of success with what were now perceived to be extra challenging learning tasks. Responses and remarks from students and teachers indicate that seeing the company or project come together or fall apart, getting in touch with or failing to contact relevant stakeholders, succeeding or failing in obtaining the necessary information, receiving valuable feedback or rejection from relevant others (other than teachers and peers), gaining access to companies or failing to do so, and experiencing the consequences of right and wrong decisions, were experiences that had influenced the students' perception of task-related self-efficacy in EE, and that this had been complicated by the SARS-Cov-2 lockdown. These explanations correspond with the SDL literature, which postulates that to cultivate learner confidence, or task-related self-efficacy, one requires a sense of authentic mastery, experienced by a perceived degree of stretch as they strive beyond their acknowledged competence level (Bandura, 1997).

6.2.5 Impact of the Social Learning Context

Constructivist education literature emphasises the importance of collaboration with others for learning (Rogoff, 1994; Bandura, 1977, Lave and Wenger, 1990). An optimal collaborative learning environment, the literature proposes, has learners work together in asymmetrical and varying roles, in a shared domain of interest, with a community of people who interact and learn together to develop a shared repertoire for their practice (Lave and Wenger, 1990; Rogoff, 1994). In contextualised EE this is applied in the formation of diverse student (venture) teams that are coached or supervised by a teacher and that require collaboration with stakeholders from within and outside the classroom context. The shared domain of interest is that of the international business programme and entrepreneurship, in which they share the repertoire of planning (and execution) of a venture start-up.

The SDL and constructivist education literatures agree that for learners to initiate and/or engage in challenging learning situations, the learning environment needs to be safe, where there is tolerance of failure and recognition of difference in knowledge and skill (Merriam *et al*, 2007; Schunk and Pajares, 2002, Politis, 2005). The results of the template analysis confirmed the essence of these elements in the social learning environment and how these had influenced the enhancement of the relationship between the variables. Well-functioning teams were found to spend time to get to know each other, create a personal connection, create a social bond, in which its

members could feel free to share their fears and frustrations. Well-functioning teams voiced appreciation for its individual members and accomplishments realised, and shared personal strengths and weaknesses to facilitate collaborative learning. Discussing together what success meant for each individual and agreeing upon a joint definition of and objective of success was shown to be good practice for avoiding friction and for providing support to each other. One of the strongest influences within the social learning environment on self-efficacy and motivation for self-directed learning that was identified to be the team dynamics. Students categorized in the end-term surveys as “Highly Motivated (score 8-10)” rated team-collaboration as a strong motivator (62%), whilst 38% of this group of respondents made mention of unbalanced team efforts having had a negative influence on their motivation. Of the students in the category “Moderately Motivated” (score 5-7) 47% mentioned team collaboration as a motivator against 41% mentioning unbalanced teamwork as a demotivator. Within this theme, student responses confirm the essence of having a learning environment that is tolerant of failure, providing a feeling of trust and openness, and in which there is recognition for and appreciation of difference.

6.2.6 Impact of a stage-wise, mixed pedagogical approach to EE

The research examined the variation in impact that the different pedagogical approaches to EE studied have on the relationship between autonomy, self-efficacy, motivation, and self-directed learning readiness. The research evaluated the effectiveness of the proposed stage-wise, mixed pedagogical approach to EE, as applied in AMSIB’s single semester VCP Co-Creative Entrepreneurship, with is rooted in the Young Enterprise Venture Creation Programme.

The assumption that a teaching-learning approach that applies a stage-wise competence development process throughout the module might result in more enhanced levels of self-directed learning readiness than a single pedagogical approach, is rooted in the educational literature. It holds that students require a degree of familiarity with the knowledge and skillset needed for a learning task to feel self-efficacious (Bandura, 1993; Candy, 1991), and that only when they perceive themselves to be sufficiently competent, they will engage in collaborative, contextualised learning experiences (Eccles, 2005; Wigfield *et al.*, 2006; Pintrich and Schunk, 2002), particularly those that are radically different than students are used to (Bell and Bell, 2020), such as those of starting and running a student company.

The SDL literature assigns a critical role to educators in giving meaning to abstract knowledge, acquainting students with how knowledge learned inside the classroom can be applied in real life situations (Guglielmino 2013, Merriam and Caffarella, 1999; Grow, 1991). The educational literature proposes a hierarchical approach to competence development, positioning the target (maturity level) of competence at the top of the hierarchy and gradually identifying prerequisite skills, continuing down until one arrives at the maturity level at which learners can perform now (Dick and Carey, 1985; Schunk, 2009). Gradual development of knowledge and skill, matching teacher role to student needs, the SDL literature predicted, would lead to higher levels of students' willingness to be self-directed (Grow, 1991).

The quantitative data analysis confirmed this assumption for the students' self-reported levels of self-directed learning readiness. Variation between the samples with regard to enhanced SDLR was found to be statistically significant ($t = 2.03$; $p = .045$) with a higher level of self-directed learning readiness realised in the stage-wise, mixed pedagogical approach to EE than the single, self-steered approach to EE. Motivation and self-efficacy were found to be affected similarly between the samples. Students' autonomy was found to have gained more benefit from the self-steering approach to EE as applied in the control group. The variation between the samples was found to be statistically significant ($t = -3.36$; $p < .001$), indicating a significantly lower impact on autonomy perceived by the students in the stage-wise, mixed pedagogical approach.

The enhanced levels of self-directed learning readiness were explained in the responses of the mid-term evaluation survey as students having experienced substantial benefits from combining learning about entrepreneurship related topics, methods, and tools in formal lectures⁴ with practicing with it in class prior to its application in the real-world context⁵. The benefits are predominantly related to students feeling more confident after practicing in the safe setting of a classroom, which is supported with arguments such as working with peers and getting feedback from peers and teachers, to approach the learning tasks independently. These observations confirm the proposition brought forward in the educational theory that students tend to approach learning challenges more proactively when they feel sufficiently confident for the task. These findings may also be translated as evidence that a pedagogical

⁴ 58% of the respondents indicated that "engagement in the lectures" contributed to feeling "much" to "very much" in control (autonomy) over learning process; and 59% feeling "much" to "very much" empowered (self-efficacy) to conduct the learning challenges.

⁵ 57% of the respondents indicated that "participation in the in-class workshops" contributed to feeling "much" to "very much" in control (autonomy); and 63% feeling "much" to "very much" empowered (self-efficacy); and 57% feeling "much" to "very much" motivated to engage in the learning task.

approach focused on building task-related self-efficacy reaps higher benefits for students' motivation to participate in existential, transformative learning.

Responses to the open question surveys highlighted the positive impact of practicing with the newly gained knowledge and necessary skills in a simulated setting prior to approaching the learning activity in the 'real-world' on students' perceived levels of task-readiness. Participation in the workshops, in which the students were tasked to practice with the knowledge and skills required for the learning task prior to executing this in its authentic setting, was identified as empowering (53% much to very much against 35% average and 8% below average) and motivating (57% much to very much, against 37% average and 6% below average). This enhanced empowerment is explained with the increased correlations with feeling better prepared for taking on the learning challenges, feeling more comfortable after discussing approaches with teammates, and having been able to practice before going into the real world, as discussed in section 6.2.2. Having a teacher available in differing roles, switching from instructor to supervisor and to coach depending on what the team or student needs, was found to be an important factor for student satisfaction, autonomous motivation, and perceived self-efficacy.

The importance of matching instruction and guidance with students' individual needs, whether to help students find and validate information, to provide more clear instruction or to give constructive feedback, was confirmed. Not only the positive responses from the participants in the VCP CCE's stage-wise, mixed pedagogical approach to EE also confirmed this. Its importance was emphasised in the negative responses from the participants in the self-steering single pedagogy approach as applied in the control group. Lack of instruction, lack of guidance, minimal feedback on content and the highly limited contact time with the teacher was indicated as a source of demotivation and reduced self-efficacy.

The findings also confirmed the essence of including an element of existential, experiential learning in an authentic contextual setting. Students' autonomous motivation for self-directed learning was found to be positively influenced by their experienced sense of ownership and responsibility over their learning tasks, and the consequences of their decisions and actions taken within them.

6.3 Conclusion

Lessons learned from this research about how students learn in EE include that, upon starting their undergraduate (international business) study, they may be so used to being instructed and guided to achieve study results that they tend to feel insecure about approaching existential learning activities, especially as these require them to step outside the boundaries of the educational context and into those of the real (professional) world. Insecurity or lack of self-efficacy negatively affects motivation to pursue learning opportunities, so students, in this state of insecurity, will avoid learning tasks that they feel not ready for. Student empowerment, by means of enhanced self-efficacy, triggers motivation for self-directed learning, which is the result of the right mix of instruction, guidance, freedom to experiment, and challenge.

Participating in entrepreneurship education proved to contribute to transforming teacher dependent, consumptive learning behaviour towards independent, constructive learning behaviour. It was found that the continuous cyclical process of entrepreneurial competence development, such as applied in programmes grounded in the approach of the Junior Achievement's Young Enterprise, enhances students' self-efficacy and motivation for self-directed learning. The unique stage-wise combination of pedagogical approaches (from familiarisation with theory, through recognition of its application in practice and practice with its application themselves, prior to experiencing its application in the authentic, real-world context) was found to effectively enhance students' confidence in their ability to self-direct their learning. In this process team-based learning and the provision of supervision and guidance from teaching staff and role models from the field were found to play an important role in the learner transformation process.

Monitoring the effects of different approaches to teaching-learning applied in entrepreneurship education taught us the impact that experiencing real-world consequences of learning activities has on students, and how this can enhance, but also obstruct, autonomous motivation. It also taught us that to feel task-ready for and to thrive in such authentic, real-world, experiential contexts, students need to feel competent, safe, and supported. The guided pedagogical approach to entrepreneurship education, that combines passive learning about entrepreneurship related topics, tools, and methods, with interactive, in-class workshops in which students get to practice with the application of the newly gained knowledge of such entrepreneurship related topics, tools, and methods, proved to empower students to take on the challenge of experiencing the effects of the learning activities in the real-world.

The study also showed us the importance of team dynamics and how these are determined by openness, by genuine interest in the person beyond the performance of the task, and by how expectations are managed. The presence and dynamic role of the educator in the learning process, switching between lecturer, organiser, and moderator in the workshops, as coach to help students bridge knowledge gained inside the classroom to its application in the real-world, and as supervisor of the experiential learning activities was identified as another key success factor to aid the learner transformation towards self-directed learning readiness.

7 Contributions of the Research

7.1 Implications for Practice

The findings from the study contribute to practice by providing a conceptual framework for understanding the elements that lead to or affect students' self-directed learning readiness, and by proposing a practical teaching-learning framework for the organisation and evaluation of EE learning activities that aim to enhance self-directed learning readiness, both of which were evaluated with this research.

The proposed teaching-learning framework, grounded in the SDL theory and mirroring the approach to teaching-learning that is common in the Junior Achievement Young Enterprise Programme, may be used for the design of curricula that intend to prepare students for self-directed lifelong learning, that target broad learner audiences, with diverse learning styles and varied maturity levels of knowledge and skill. Its key thought is that the application of a stage-wise, iterative approach to teaching-learning, using multiple pedagogies may accomplish higher levels of self-directed learning readiness. The findings of this research confirm the propositions made in the SDL literature that for effective learner transformation, learners benefit from being taken through various stages of knowledge and skill development, such as in the proposed framework. The contribution of this research to practice is therefore that the proposition to apply a stage-wise, approach to learning that combines various pedagogical approaches and allows for students to continuously iterate between them, in each phase of the students' competence development, throughout a learning module, instead of in subsequent modules or academic years (Figure 31, p.197). The proposed stages to build competence are:

- i) Familiarising: a passive learning component should precede experiential learning tasks to provide foundational cognitive understanding of subject matter, familiarising students with what is to be known. The role of the educator in this phase is that of expert / lecturer.
- ii) Recognising: Familiarising with theory, methods, models, tools should be followed up immediately with interactive, participative in class peer-learning sessions to recognise how the newly gained knowledge is applied in authentic settings (e.g., through case study discussion, debates, presentation of applied

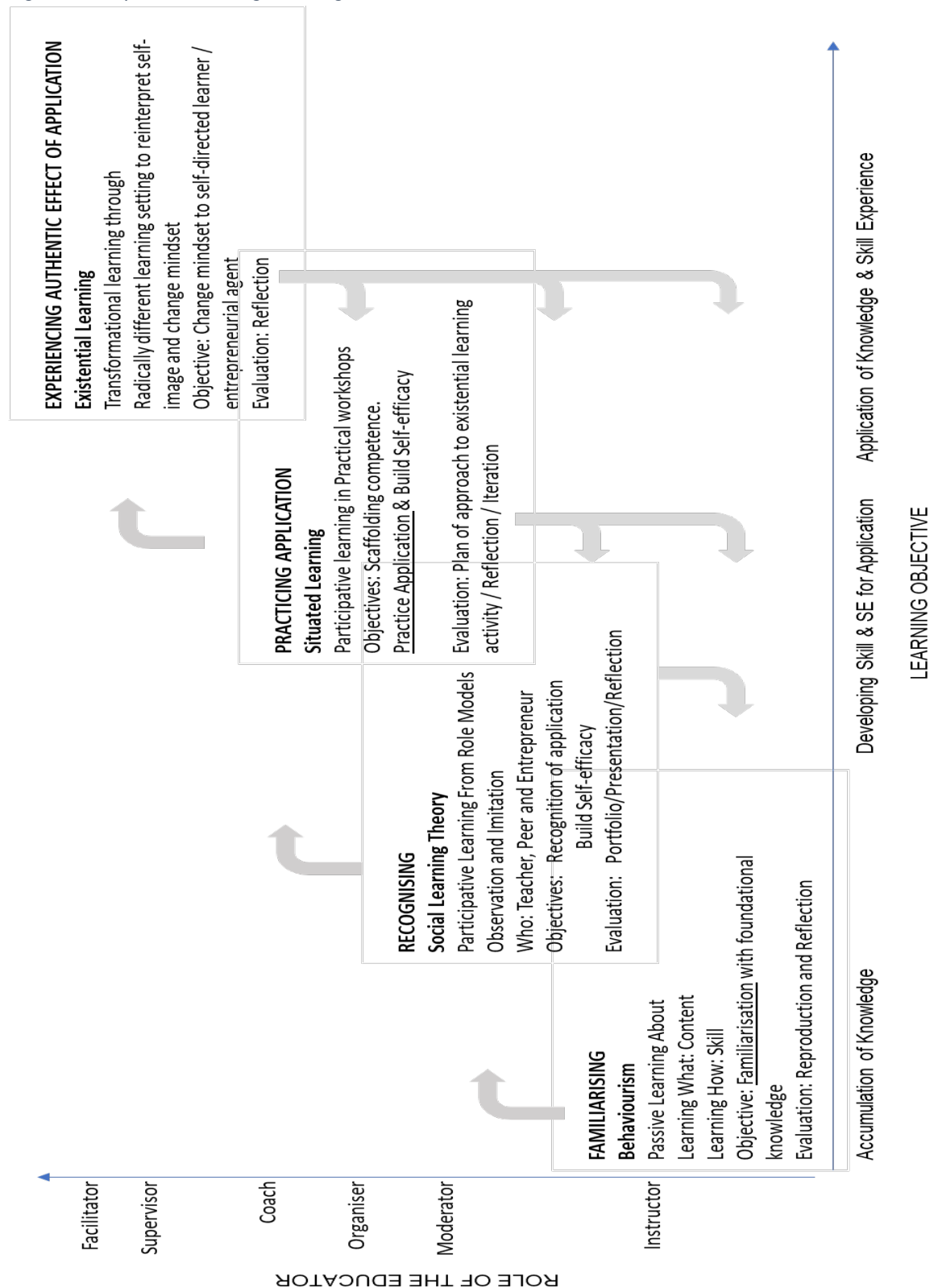
research findings). The role of the educator changes in that of moderator, role models in this phase are examples in the case studies and peer learners.

- iii) Practicing application: To prepare the students for the existential learning activity, they should be given the opportunity to practice with the newly gained knowledge and skill within the safe environment to the classroom, to become confidently task ready. In this phase, which follows the previous two (familiarising and recognising) students prepare themselves for the existential learning task in a practical workshop. The role of the educator in this phase is that of organiser and coach. The students become role models for each other, within their own teams, and when tasked to briefly pitch their plan of approach before executing the existential learning task, their other classmates serve as additional role models. The organising task of the educator is that of creating a learning environment where controlled 'safe' experimentation of the various steps in the learning process is made possible and guided learning occurs. The concept of trial-and-error learning, which is central to experiential learning and entrepreneurship more generally, should be incorporated inside the classroom so that students become more comfortable with the ambiguity and uncertainty inherent in contextualised experiential learning activities that take place in real-world contexts.
- iv) Experiencing application: existential learning activities should be integrated in the entire learning cycle and be incorporated in genuine authentic settings in which the students experience the consequences of their actions and choices in the real-world. The emphasis in the recommendation is that these existential learning activities are an integrative part throughout the learning module instead of in subsequent modules or study years. The role of the educator in this stage is that of supervisor and facilitator. The role models for the students are the representatives of the authentic, real-world setting in which the learning tasks are accomplished.

Considering how participating in such a stage-wise, mixed-pedagogy approach to EE, as applied in the case study of this research, seems to have positively affected the students' perceived levels of self-efficacy and motivation for self-directed learning and entrepreneurial agency, I recommend applying all four stages of learning throughout the educational module. With the research indicating the importance of openness about (learning) needs and expectations of individuals for positive team dynamics, and of recognition and appreciation of diversity, students it is recommended to stimulate students to continuously reflect on their achievements and discuss these

with their peers. Because deep learning and enhanced self-efficacy are said to be achieved through the application of and reflection on the acquired knowledge and skill, especially when openly discussed in peer-groups, it would be advised to facilitate students to iterate between the various learning stages at their own pace and level.

Figure 31 Proposed Teaching-Learning Framework for SDLR



Experiential learning programmes may benefit from including a flexible role of the educator, balancing instruction with self-direction, providing guidance and feedback, at both team and individual levels, so that learners' self-confidence may not be negatively impacted by the results of experiential learning experiences.

Figure 31 illustrates the proposed teaching-learning framework for the stage-wise, iterative approach to enhance self-directed learning readiness, which is grounded in the belief, and confirmed in the findings, that self-directed learning readiness is predicted by the level of perceived self-efficacy. Table 41 (p.184) proposes practical operationalisation of (according to the 2014 National Survey of Entrepreneurship Education, commonly used) EE activities for the proposed learning stages, aligning learning approaches, activities, pedagogy, objectives, teacher roles and assessment formats with Fayolle and Gailly's (2008) Teaching Model Framework.

Besides the teaching-learning process, the following may be taken into consideration to establish a learning climate that supports enhancement of self-efficacy:

- i) The learning climate is tolerant of failure and appreciative of varying qualifications
- ii) The learning climate encourages students to discuss their personal learning preferences and learning needs
- iii) The learning climate challenges students to identify and exploit personal learning goals
- iv) The involvement of the teacher is matched with individual student needs
- v) Teacher involvement is balanced between instruction and freedom, and between self-direction and guidance
- vi) Constructive feedback is provided for content-related and process-related aspects
- vii) Students are encouraged to learn from and support each other.

Implementing these recommendations to educating for self-directed learning readiness may have consequences for the organisation of education. It broadens the role of the educator from that of either a lecturer, a mentor, a coach, or a supervisor, to being all of these. This requires teachers to be comfortable to switch from process dominator to process facilitator and from taking control to giving control.

7.2 Contribution to extant literature

The entrepreneurship education literature proved to be divided about the efficacy of EE, stating that more fine-grained understanding is needed about how students experience learning in EE and how their experiences affect their motivation to pursue learning opportunities. With this research I set out to contribute to these voids in the literature, aiming to gain a deeper understanding of the efficacy of entrepreneurship education, focusing on entrepreneurial behaviour towards (lifelong) learning, a theme only recently gaining attention in the EE literature. In response to the concerns about weak experimental design, I decided to use a quasi-experimental research design for the collection and analysis of quantitative data and complement it with explanatory qualitative research. In response to the concern about fragmentation due to the myriad of different pedagogies and case studies that make up the qualitative EE research domain, I decided to focus my research on the broadly applied Junior Achievement Young Enterprise Programme's pedagogy as the main intervention studied. Through the application of the quasi-experimental, mixed-methods design and its focus on such a representative case for EE practice, the outcomes of this research contribute to the extant EE literature, providing a more fine-grained understanding of what works, why and how in EE.

It is among the few studies in the EE literature that use an academic development outcome as a dependent variable. To this end, it makes novel contributions to the literature on EE by introducing a practical teaching-learning framework for EE that links EE learning activities with teacher-roles, in alignment with established educational theory (Fayolle and Gailly, 2013; Bechard and Gregoire, 2005). The proposed teaching-learning framework builds upon the proposed integrated learning approach of teacher-led and student-centred (Robinson *et al.*, 2016) and aligns with Macht & Ball's (2016) authentic alignment framework and Bell & Bell's (2020) proposed approach to experiential learning. It adds to these frameworks that all the stages of the learning cycle should be implemented within each phase of competence development, within an EE module. The research contributes to the efforts made for embedding of EE in educational science, aligning the various teaching-learning activities to relevant educational theories in the proposed teaching-learning framework and explaining their effects on students.

This research unpacks EE pedagogy and provides an important contribution about the effects of compulsory venture creation programmes for bachelor level business students and a deeper understanding of what causes those effects. It has scant knowledge about the impact of compulsory, instead of voluntary, venture creation

programmes. This is of considerable interest given the EU's objective that "all young people should benefit from entrepreneurship education, including at least one practical entrepreneurial experience before leaving education" (European Commission, 2013, p3). Most venture creation programmes are voluntary components of bachelor and master level programmes which leads to a self-selection bias towards entrepreneurial intention, aptitude, or attitude. Studies that draw on data from voluntary VCPs may be overstating the impact of the programme when generalizing to a larger population of students. By avoiding a self-selection bias in our study, the study contributes to a greater and deeper understanding of the benefits of pedagogical approaches in VCPs not only for entrepreneurship outcomes but also for academic development outcomes.

The second contribution to the EE literature highlights the moderating effect of EE pedagogical approaches. Given the context of this study – a compulsory experiential entrepreneurship VCP that consisted of passive, participative and active pedagogy – it was able to parse two distinct approaches: 'learning through' entrepreneurship (self-steering pedagogy) and a stage-wise, iterative approach to 'learning about, for, in and through' entrepreneurship (passive, participative and active pedagogy to meet the need of the students). Matching pedagogical approaches and guidance within existential learning activities in experiential entrepreneurship programmes with learners' maturity levels of learner characteristics may have a significantly moderating effect on the VCP's impact. Towards understanding how students transform into entrepreneurial agents (Jones, 2019) this research emphasises the importance of developing students' self-efficacy for learning in EE. It adds to Macht and Ball's (2016) proposed pre-during-after experiential learning that students with high levels of self-efficacy, and who are intrinsically motivated to thrive in an active experiential learning approach, are likely to perform well in VCPs. On that same page, students who have lower self-efficacy and whose motivation is more geared towards obtaining study results, who prefer a more teacher directed, guided approach to entrepreneurship learning may experience lower or decreased levels of motivation, confidence, and autonomy in VCPs, as predicted by the theory of self-directed learning (Grow, 1991; Candy, 1991), especially if these are refrained from instructional guidance.

The research makes a strong empirical contribution to the literature on self-directed learning readiness through the introduction of a novel conceptual framework for understanding and evaluating self-directed learning readiness in undergraduate business education. This research adds to this body of literature with an empirical contribution of the predictors of self-directed learning readiness among business

students and provides statistically significant evidence that greater levels of autonomy, self-efficacy, and motivation lead to increased self-directed learning readiness.

7.3 Research Limitations

In chapter 3 I discussed my relativist ontological stance on truth, how I believe that no single truth exists, but that truth is a construction of agreed concepts and subjective experiences of reality and that truth and reality therefore differ between individuals. From this stance on truth, the results of this research, evaluating human behaviour, more specifically assumed predictability and sustainability of change in human behaviour through an educational intervention, should not be generalised across learners or programmes. I explained that even within programmes, students create different truths about what works for them, how and why in developing skills and competences, and how the concept of perceived competence is subject to situation, context and likely even the emotional state of the student when they take the self-assessment survey. The results of the research therefore reflect only the collective experiences of this specific group of participants, as they reported on their experiences within the unique setting of participation in the EE modules at one university, even though the case study does represent a very broadly applied version EE and are therefore not generalisable. Repetition of the research is recommended with similar student groups in similar EE modules at different universities and different educational levels to deepen and broaden our understanding of the EE-SDLR relationship.

Another important limitation of this research is that it was conducted during the unique situation of the SARS-Cov-2 imposed lockdown of society, which, as the results have shown, has had a significant impact on how students experienced the learning activities. Repetition of the research with the same population under the 'normal' circumstances of campus-based teaching may well result in different outcomes. The fact that this research relies on the self-reported measures of learner characteristics and self-directed learning readiness might prove to limit its reliability and generalisability due to possible respondent bias. To reduce bias in these measurements, I asked several questions to proxy the same concept and used factor analysis to make indexed measurements and drew on scales that were validated in prior studies to reduce bias.

Finally, this research was conducted for the provision of a professional doctorate degree and therefore a single-person research project. The consequence of which is

that important elements are likely to have been overlooked that would contribute to our enhanced understanding of the EE-SDLR relationship.

7.4 Future Research

It is recommended that the proposed frameworks are applied and evaluated in a broader setting, at other faculties and higher education institutions, both within and outside of The Netherlands. Future research might explore similar relationships and the moderation of EE pedagogy over longer periods of time to better explain the academic and entrepreneurial development of business students. Additionally, studies based on longitudinal designs conducted over set temporal periods may be able to further isolate exogenous environmental factors that affect results from cross-sectional designs.

7.4.1 Current developments resulting from this research

At the request of the Dean of the Amsterdam School of International Business, the proposed teaching learning framework for enhancing self-directed learning readiness through entrepreneurship education was introduced to its entire faculty in May 2022 during a train-the-trainer workshop. Following this workshop, two additional training workshops have been organised, at the Faculty of Business and Economics and at the Faculty of Technology.

I have been approached to introduce and evaluate the proposed teaching / learning framework as part of an Erasmus+ programme project “train the trainer evidence-based entrepreneurship curriculum” in a consortium of EU higher education institutions from Norway, Finland, Estonia, Belgium and The Netherlands. During this Erasmus+ project, the survey tool will be evaluated and implemented in the modules involved at these institutions.

The abstract of this thesis was submitted to, and accepted, by the European University Network on Entrepreneurship (ESU) in response to a call for book chapters for a 2023 publication “Stimulating Entrepreneurial Activity in a European Context: Reflections on Programs, Courses and Cases”, to be integrated in the European Research in Entrepreneurship series, edited by S. Costa, A. Groen , F. Liñan and A. Fayolle.

The research is currently repeated with the 2022 cohort of students participating in the modules studied for this thesis with the aim of determining the validity of the results against the background of the SARS-Cov-2 situation.

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Appendix 1 Pre-Intervention 2021 Survey Questionnaire

Assessment tool Behavioural Indicators autonomy, self-efficacy, and motivation for entrepreneurial learning (Pre-Test)



Entrepreneurship for Self-directed Learning

Thank you for taking the time to complete this survey.

This questionnaire is part of a doctoral study to evaluate the efficacy of the entrepreneurial project module(s) taught at AMSIB.

You are asked to take the survey at the start and upon completion of each block with an entrepreneurial project. The results will be presented to you in a personal dashboard to help you identify how elements in project-based learning influence your attitude and behaviour. Taking this assessment gives you insight in your own development and is to be used for reflection purposes. The results (pre- and post-project assessment) can also be used in the peer assessment, when sharing and discussing results with your team.

The assessment consists of 10 personal and situational questions and 22 specific (multiple choice) questions. In the multiple-choice questions, you are asked to select the behaviour that best describes what you do in the current situation. It will take approx. 15-20 minutes to complete the survey. Please take your time to read them carefully before answering to allow you to get the best insight in your performance and development. The results will NOT be shared with anyone to guarantee your anonymity and stimulate your complete honesty.

Your decision whether or not to participate in this study is voluntary and will not affect your relationship with AMSIB. If you choose to participate in this study, you can withdraw your consent and discontinue participation at any time without prejudice. If you have any questions, please contact Ms A.N. Timmermans at (31)06 21157326 or a.n.timmermans@hva.nl.

The information collected may be used for research purposes by AMSIB to monitor and continuously improve our education. The overall results will be used for a doctoral study on the impact of entrepreneurial education on student development. All collected data will be handled confidentially, stored securely and anonymized for the purpose of analysis. If data from the results is to be used in publications, conference presentations, workshops or in other public channels, only aggregated and anonymized data will be made available, and for research purposes conducted by AMSIB researcher staff only.

Research information will be kept in locked files at all times. Only research personnel will have access to the files. After the study is completed (at the latest by July 2022, all collected data will be destroyed).

By ticking the box below, you indicate that you have decided to participate in the study after reading all the information above and you understand the information in this form.

☐ I HAVE READ AND ACCEPTED THE PRIVACY STATEMENT

Personal and Contextual questions:

Your first name?

Your last name?

What is your email address?

Which programme are you in?

International Business Fast Track

International Business

International Business Fast Track

AMSIB Minor

Exchange

Other

M/F

Please Choose

My main study ambition at AMSIB is

Please Choose

1. prepare for a master

2. optimize my employability

3. prepare for a management position

4. prepare for starting/running my own business

My current work experience is

Please Choose

no job

Part time work MBO level

Part time work HBO level

Family business

Own business

I wish to share my experiences in the qualitative part of the study

Please Choose

YES

NO

BACK

NEXT

Assessment tool Behavioural Indicators autonomy, self-efficacy, and motivation for entrepreneurial learning

Q1. Having to work on this entrepreneurship project from home instead of school, I expect

- A** more guidance from teachers
- B** more clearly defined tasks
- C** stronger collaboration with peers
- D** more freedom to do things our own way
- E** to put more effort in inspiring the team

Q2. When instructions for assignments are very specific, I

- A** feel most certain I can succeed
- B** follow most of them step by step
- C** use them as guidelines to make the right choices
- D** use them as guidelines to explore alternative approaches
- E** determine the objectives and try different approaches

Q3. To start a student company in the current Covid-19 situation, I think is

- A** Absurd, why not compensate this module?
- B** risky, as I risk missing credits I need
- C** challenging, but I'll make the most of it
- D** a good way to expand my capabilities
- E** the best opportunity to learn new things

Q4. To come up with a potential business idea, I

- A** will join someone who has an idea
- B** identify things that would improve in my own life
- C** study how entrepreneurs deal with growth/survival
- D** explore options with entrepreneurs in my network
- E** explore and test various ideas with stakeholders

Q5. In the current online learning situation, I

- A** struggle
- B** sometimes feel uncertain
- C** cope
- D** feel quite comfortable
- E** thrive

Q6. When I feel I have a good (business) idea, I

- A** usually keep it to myself
- B** research similar ideas to evaluate potential
- C** ask others what they think of it
- D** ask others how to improve it
- E** test it to discover its potential

Q7. When my idea is rejected, I

- A** feel hurt and withdraw from the conversation
- B** feel disappointed but continue discussing others' ideas
- C** come up with stronger arguments to get it accepted
- D** ask why and how to improve it
- E** come up with new ideas

Q8. To decide what resources are needed for a task, I

- A** ask (instructor) for advice
- B** check the instructions
- C** discuss with the team what we think
- D** list requirements and ask others for input
- E** list and evaluate various alternatives

Q9. To make sure we as team succeed in this project, I

- A** do my tasks as agreed
- B** involve team member(s) in my tasks
- C** offer my support to team members
- D** Inspire team for optimal collaboration
- E** collaborate with all relevant stakeholders

Q10. 2 days before a deadline my work is usually

- A** <25% done
- B** 50% done
- C** 75% done
- D** >75% done
- E** done and submitted

Q11. When I have trouble obtaining resources needed for a project, I

- A** lose motivation or deprioritize
- B** ask for help
- C** continue to push ahead
- D** evaluate & discuss with the team how to proceed
- E** try alternatives or a different approach

Q12. To collect and validate project information, I

- A** use Google as a main source
- B** Study various case studies
- C** Use professional sources and try a survey
- D** interview experienced professionals
- E** use various sources and talk to professionals

Q13. To get input from professional people, I

- A** send them emails and await reply
- B** ask people I know for help
- C** use LinkedIn to connect
- D** have a phone conversation with them
- E** organize a discussion session with them on zoom

Q14. The Belbin team role that fits me best is

- A** monitor, observer
- B** completer, finisher; analyst
- C** team worker, implementer
- D** shaper, coordinator
- E** plant, resource investigator, specialist

Q15. To determine my tasks and objectives, I

- A** wait for instructions
- B** ask the team what they want me to do
- C** negotiate a task division with the team
- D** determine and divide tasks
- E** inspire the team to initiate activities

Q16. When tasks and goals are unclear, I

- A** ask for clarity from teacher/instructor
- B** ask others what they do
- C** explore the course materials for clarity
- D** find examples in relevant other resources
- E** determine & execute a strategy with the team

Q17. I consider the activities in the project to be

- A** not motivating or too demanding
- B** demanding for the credits they are worth
- C** valuable for understanding business practices
- D** essential for building a successful business
- E** unique opportunities to develop myself

Q18. To make the most of the project tasks, I

- A** do what my team asks me to do
- B** follow the instructions in Brightspace
- C** participate in the organized activities
- D** organise activities with my team
- E** organise activities with relevant stakeholders

Q19. My Grade point average is (approx)

- A** <5
- B** 5-6
- C** 6-7
- D** 7-8
- E** >8

Q20. To put in practice what we learn, I

- A** deepen my understanding theoretically first
- B** inform myself about others' experiences first
participate in the workshop and then study
- C** theory
- D** plan with team how we go about it
- E** experiment with different approaches (trial-error)

Q21. In suddenly changing situations, I

- A** feel I lose control
- B** seek help from teammates
- C** discuss with the team how to respond
- D** take time to reconsider the next step
- E** rely on my skill to adapt

Q22. To maximize my potential, I

- A** focus on my assignments
- B** perfect my own work
- C** improve the work of others
- D** constantly reflect on and improve my abilities
- E** purposefully do things beyond my abilities

Questions 1, 2 (opportunity recognition/creation), 8, 9, 10 (resource management) are related to autonomous behaviour,

Questions 3, 4 (opportunity recognition/creation), 11, 12 (resource management) and 19 (into action) are related to motivation for the learning tasks

Questions 5-7 (opportunity recognition/creation), 13, 14 (resource management) are related to self-efficacy to undertake entrepreneurial activities.

Questions 15, 16, 17, 18, 20, 21 and 22 (into action) reflect behaviours indicative for self-directed learning readiness.

Appendix 2 Post-Intervention 2021 Survey Questionnaire

Assessment tool Behavioural Indicators autonomy, self-efficacy, and motivation for entrepreneurial learning

- Q1. I want instructions for assignments to be
1. very detailed (formats/templates/examples)
 2. detailed with objectives
 3. more like guidelines
 4. somewhat open for own interpretation
 5. open for my own interpretation
- Q2. I experienced the assignments in the module free for my own interpretation
1. not at all true
 2. not true
 3. enough
 4. true
 5. very true
- Q3. I enjoyed this module
1. not at all true
 2. not true
 3. somewhat true
 4. true
 5. very true
- Q4. Due to the Covid lockdown situation,
1. I experienced extreme motivation problems
 2. I felt disengaged from classmates
 3. I put more effort in team work
 4. I put more effort in contributing to the creation process
 5. it was a uniquely challenging learning opportunity
- Q5. Whenever we needed to brainstorm on issues, I
1. was mostly quiet, learning from others
 2. joined and supported others
 3. brought insights (ideas) gained from my own experience
 4. brought insights gained from stakeholders
 5. led and inspired the discussion
- Q6. I felt comfortable proactively speaking my mind in class/team
1. not at all true
 2. not true
 3. somewhat true
 4. true
 5. very true
- Q7. What helped me most in building my entrepreneurial confidence was
1. nothing, the module made me feel less confident
 2. learning about the various topics in the lectures (theory)
 3. practicing with tools and topics in the workshops (interactive workshops)
 4. the combination of theory, workshops and the actual startup experience
 5. the process of starting and running the company / consultancy

- Q8. Throughout the startup process I
1. stayed in the background
 2. asked what the team wanted me to do
 3. proactively did my part
 4. sometimes took a leading role
 5. took the lead in the team (CEO)
- Q9. To gather the knowledge and resourced we needed to succeed, I
1. asked (instructor) for advice
 2. checked the instructions
 3. divided the tasks in the team
 4. listed requirements and asked others for input
 5. consulted (re)sources beyond the scope of the project
- Q10. The key success factor in our team I think is
1. none, I feel we failed
 2. support from coach or team leader
 3. task division and planning
 4. team collaboration on tasks
 5. collaboration with relevant stakeholders
- Q11. My contribution to the team effort was
1. far below the average
 2. below team average
 3. on team average
 4. above team average
 5. far above team average
- Q12. My source of motivation came from
1. having to pass the module
 2. the inspiration from teacher/coach/assistant coach
 3. collaboration with my team mates
 4. the freedom to determine own goals and approach
 5. the experience of learning in the real-life setting
- Q13. This entrepreneurial experience inspired me to continue with something similar later
1. I strongly disaree
 2. I disagree
 3. I somewhat agree
 4. I agree
 5. I strongly agree
- Q14. Getting input from external stakeholders, I
1. failed miserably
 2. experienced difficulty, but managed to get a few
 3. tried/opted for a survey when interviews failed
 4. succeeded with some interviews
 5. persisted until I had what we needed
- Q15. The team role that describes me best is
1. quiet observer
 2. completer, finisher, analyst
 3. team worker, implementer
 4. shaper, coordinator
 5. team leader, inspirator

- Q16. The module sparked my awareness of what I need(ed) to learn
1. completely disagree (too unspecific)
 2. disagree
 3. somewhat agree
 4. agree
 5. completely agree (freedom to discover)
- Q17. I have exploited new learning objectives beyond the scope of the project
1. not at all true (follow module instructions only)
 2. not true
 3. somewhat true (in addition to course instructions)
 4. true
 5. very true (module instructions are just the foundation)
- Q18. Participating in this project motivated me to explore more (high)risk learning opportunities
1. Not at all true
 2. within the boundaries of the study
 3. somewhat
 4. true
 5. very true
- Q19. To actively engage with my team members online instead of on campus affected me
1. very negatively (felt less engaged)
 2. negatively
 3. no effect
 4. positively (eg discovered new comfort)
 5. very positively (enabled more engagement)
- Q20. To deal with set-backs, I
1. ask(ed) for help from teacher/coach
 2. ask(ed) for help from team mates
 3. discuss(ed) with the team how to proceed
 4. propose(d) different ways to proceed
 5. took the lead in proceeding
- Q21. What contributed to my confidence to explore (high) risk (learning) situations was
1. not much, still feel rather insecure about stepping in the unknown
 2. supervision and guidance
 3. the theoretical and practical preparation
 4. working in a team
 5. freedom to experiment
- Q22. I feel more confident to explore new (high) risk learning challenges
1. Not at all true
 2. Not true
 3. somewhat true
 4. True
 5. Very True

Questions 1, 2 (opportunity recognition/creation), 8, 10, 12 (resource management) are related to autonomous behaviour,

Questions 3, 7 (opportunity recognition/creation), 9, 11 (resource management) and 19 (into action) and are related to motivation for learning and self-modification,

Questions 4-6 (opportunity recognition/creation), 14, 15 (resource management) are related to self-efficacy to undertake entrepreneurial activities.

Questions 13, 16, 17, 18, 20, 21 and 22 (into action) reflect behaviours indicative for self-directed learning readiness.

Appendix 3 Questionnaire (Pilot) ex-POST CCE Survey 2020



Introduction

1.1. Dear respondent,

This questionnaire is part of a study to identify how various elements in the venture creation project (CCE) facilitate a deeper sense of self awareness and how this influences motivation for self-planning and self-management in a learning process. Our aim is to investigate how an experience of being an entrepreneur in a project affects entrepreneurial, self-directed behaviour in learning processes, preparing for, or supporting changes such as those currently caused by the Covid-19 situation.

This is a research project from the Amsterdam University of Applied Sciences (AUAS) and is related to a doctoral research on entrepreneurship education. All data collected will be handled confidentially, stored securely, and used for the purpose of analysis for this study and the doctoral research. Data used in publications, conference presentations, workshops or in other public channels will be aggregated and anonymized.

We greatly appreciate your time in filling in the questionnaire. If you would like to receive the findings of the study, and or wish to participate in the qualitative data collection phase, please leave your name and email address at the end of the survey.

Kind regards,

Anoesjka Timmermans, Lecturer Researcher
Entrepreneurship & Entrepreneurship Education

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General Information

2.1 My Study motivation to choose for AMSIB

- Didn't know what study to choose
- Getting a degree with broad career opportunities
- Learn for business and management
- Learn for entrepreneurship

2.2 My Career ambition

- Research
- Employment at MNC
- Employment at SME
- Self-employment / Entrepreneurship

2.3. Gender

- Male
- Female
- Prefer not to answer

2.4 My work experience prior to joining AMSIB

None
 Part time job MBO level
 Part time job HBO level
 Family business
 Self-Employment

3.2.1 SD IND (recoded to 1=5; 2=4) - It is (NOT) the duty of the school to determine what I need to know and learn

3.2.2 I feel in control over my life and especially my school life

3.2.3 I don't like unexpected changes (recoded 1=5; 2=4)

3.2.4 I know what I want and need and do what it takes to achieve it

3.2.5 I avoid situations with a high risk for failure (recoded 1=5; 2=4)

3.3.1 I set high standards for myself

3.3.2 I enjoy being challenged

3.3.3 I know what I want and go for it

3.3.4 I want my achievements to be recognized

3.3.5 I need a team or group to undertake action and perform (recoded 1=5 2=4)

3.4_SD MOT_SE_EC2.1 I want to outperform my peers

3.4_SD SE CONF_EC2.2_3.3 I stay calm and focused when things don't go as planned

3.4_SD SE CONF_EC2.2_3.3 I enjoy change and surprise

3.4_SD AUT_EC1.3 I set clear goals for myself

3.4_SD_(Self)Planning and Mngt_EC3.2 I plan ahead and stick to my plan

3.4_SD SE CONF_EC2.5_3.4 I enjoy talking to strangers to achieve my goals

4.1 What was your main task in CCE1:

Creator / Initiator
 Researcher / Analyst
 Questioner / Debater
 Spokesperson

4.2 Please rank (from 1 most to 7 least) the various elements listed below on how much these added to your drive to perform in CCE1:

4.2 Learning ABOUT Lectures

4.2_VCP Vision (1.3) CCE1 - Vagueness of learning goals (AUT)

4.2_VCP_Learning through experience (3.5) CCE1 - Learning in a real experiment

4.2 VCP_Coping with ambiguity (3.3) CCE1 Learning from failure

4.2 VCP_Coping with ambiguity (3.3)	CCE1 - Dealing with uncertainty
4.2 VCP Creativity (1.2)	VCP Ideation - Creating something new
4.2 VCP Working with others (3.4)	CCE1- Learning with experienced entrepreneurs
4.2 VCP Validation (1.5)	CCE1 - Validating (my) concepts and ideas with strangers
4.3.1_MOT_ENT	Impact CCE1 on drive to Motivate yourself
4.3.2_IND_AUT	Impact CCE1 on drive to Activate yourself to undertake learning activities
4.3.3_SE_CONF	Impact CCE1 on drive to Motivate your team
4.3.4_AUT_MOT	Impact CCE1 on drive to Initiate new learning challenges
4.4 What was your role in CCE2?	
CEO / Team leader	
Department manager	
Co-worker – Team member	
Not applicable	
4.5 Please rank (from 1 most to 8 least) the various elements of actually running the business on how they added to your drive to perform in CCE2:	
4.5.1_SE_ENT	Dealing with stakeholders
4.5.2_AUT_ENT	Generating sales
4.5.3_MOT_ENT	Developing social media content
4.5.4_MOT_ENT	Actual running of the business, without rules, just guidelines
4.5.6_SDLR_ENT	Risk of failure and losing money and face
4.5.7_SE_ENT	Managing the team / company
4.5.8_SDLR_ENT	Motivating myself to do what needed to be done
4.6.1_MOT_ENT	Impact CCE2 on drive to Motivate yourself
4.6.2_IND_AUT	Impact CCE2 on drive to Activate yourself to undertake learning activities
4.6.3_SE_CONF	Impact CCE2 on drive to Motivate your team
4.6.4_AUT_MOT	Impact CCE2 on drive to Initiate new learning challenges

4.7 Please indicate if and how (1 negatively to 5 very positive) participating in CCE has affected your:

4.7.1_SDLR	Ability to motivate yourself
4.7.2_SDLR	Ability to identify your own learning needs
4.7.3_SDLR	Willingness to develop new knowledge and skills
4.7.4_SDLR	Ability to plan your own learning activities
4.7.5_SDLR	Awareness of your personal strengths and desires
4.7.6_SDLR	Confidence in your study abilities
4.7.7_SDLR	Confidence to you achieve your goals in life

4.8 Room for remarks

4.9 How did the Covid-19 situation and having to study and work from home, affect (0-decreased, 1-no change, 2-increased) your:

4.9.1_SDLR2_MOT	Self-Motivation
4.9.2_SDLR2_AUT	Self Esteem
4.9.3_SDLR2_AUT	Self-Activation
4.9.4_SDLR2_SE	Confidence in myself
4.9.5_SDLR2_SE	Sense of Competence
4.9.6_SDLR2_SE	Leadership
4.9.7_SDLR2_AUT	Sense of control over my life
4.9.8_SDLR2_AUT	Dependency on instruction
4.9.9_SDLR2_MOT	Ability to maintain / regain a study routine
4.9.10_SDLR_MOT	Desire to invest in my own development

5. Please provide your name and email address if you are willing to be contacted for a short interview or would like to receive the findings of the study.

You will be automatically entered into a draw for a EUR 250 cash reward for participating in this research.

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Appendix 4 Reliability Tests

Case Processing Summary			
		N	%
Cases	Valid	317	49.6
	Excluded ^a	322	50.4
	Total	639	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics

Cronbach's Alpha	N of Items
.723	15

Cronbach's Alpha score Post-Intervention Survey IV related Questions

Case Processing Summary			
		N	%
Cases	Valid	66	30.7
	Excluded ^a	149	69.3
	Total	215	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics

Cronbach's Alpha	N of Items
.682	15

Cronbach's Alpha score Pre-Intervention Survey IV related Questions

Case Processing Summary			
		N	%
Cases	Valid	185	58,9
	Excluded ^a	129	41,1
	Total	314	100,0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics

Cronbach's Alpha	N of Items
.727	7

Cronbach's Alpha score Post-Intervention Survey DV related Questions

Case Processing Summary			
		N	%
Cases	Valid	66	30.7
	Excluded ^a	149	69.3
	Total	215	100.0
a. Listwise deletion based on all variables in the procedure.			

Reliability Statistics

Cronbach's Alpha	N of Items
.823	7

Cronbach's Alpha score Pre-Intervention Survey DV related Questions

Cronbach's Alpha score Post-Intervention Survey DV related Questions

*Cronbach's Alpha score recoded
Survey 2020 DV related questions*

[illegible]

Appendix 5 SDLR Observation Framework

Framework for observing self-directed learning readiness among full-time business students			
SDLR Characteristic	Behavioural indicator Self-Directed Learner	Please put a cross on the line identifying behaviour shown by student	Behavioural Indicators Dependent Learner
Self Planning	Identifies, determines and articulates own learning goals	-----	Depends on teacher/instructors for determination of learning goals
	identifies learning tasks to achieve the goal	-----	Requests learning tasks to achieve the learning goals
	Charts the learning process	-----	Unaware of own learning process
	Sets standards for the achievement of his/her learning goal	-----	Follows instructor standards for achievement of learning goal
Confidence	Student knows what he/she wants	-----	Students does not know what he/she wants
	has a calm and focusses approach to the learning task	-----	Has a reluctant and/or insecure approach to learning tasks and ole in CoL/CoP
	Takes a proactive/leading role in CoL/CoP	-----	Takes a passive role in CoL/CoP
	Has a positive mindset towards challenges	-----	Has a negative mindset
	Shows flexibility in behaviour according to circumstances	-----	Shows reluctance to change
	shows high energy levels	-----	shows low energy levels
	Does not mind and deals with uncertainty,	-----	Fears or avoids uncertainty
Self-efficacy	Reflects on own needs, aspirations and wishes	-----	Unable or unwilling to reflect on own needs/aspirations and wishes
	Identifies and assesses individual and group strengths and weaknesses	-----	Unable or unwilling to assess individual and group strengths and weaknesses
	Believes in own ability to be successful in different situations	-----	Considers him/herself incapable to cope with different situations
	Handles setbacks and temporary failures as positive learning experiences	-----	Experiences setback and temporary failure as personal failures
Initiative	Initiates processes that create value	-----	Awaits instruction from others
	Takes up challenges,	-----	Avoids challenges, follows instruction instead
	Acts and works independently to achieve goals	-----	Acts and performs best following clear instructions to achieve specified goals
	Sticks to intentions and carries out planned tasks proactively	-----	Needs group pressure to undertake action and perform
Curiosity and desire to learn	Shows the tendency to recognize and seek out novel and challenging information and experiences	-----	Learning interest is limited to mandatory data or less

Framework for observing self-directed learning readiness among full-time business students			
SDLR Characteristic	Behavioural indicator Self-Directed Learner	Please put a cross on the line identifying behaviour shown by student	Behavioural Indicators Dependent Learner
Self Management	Formulates a question and generates relevant inquiries	-----	Depends on others to generate relevant inquiries
	Explores a range of possibilities and makes sound decision	-----	Follows direction and decision provided by others
	Self-plans and self-manages time	-----	Relies on others for planning, misses deadlines
	Critically reflects on own learning	-----	Does not reflect on own learning
	Initiates gathering of feedback from teachers and peers to achieve learning goal	-----	Avoids criticism; takes feedback as criticism
Independence / Autonomy	Makes clear learning choices independently	-----	Student depends on others to make learning choices
	Explores alternative learning strategies and learning resources	-----	Follows instructed learning strategies and learning resources provided
	Evaluates the outcomes of own learning	-----	Lets the outcomes of own learning be assessed by others
Perseverance	Satisfies own needs to achieve	-----	Shows no need to achieve, passive, backwards leaning
	Is prepared to be patient and keeps trying to achieve long-term individual or group aims	-----	Is impatient and gives up easily in trying to achieve long-term individual or group aims
	Is resilient under pressure, adversity, and temporary failure	-----	Gives up / stresses / panics under pressure, adversity and temporary failure
Task orientation	Focus on performance, here and now	-----	Focus on ; getting the job done
	Focus on getting the job done	-----	Tends to ride along with the team
Patience	Waits calmly in the face of frustration or adversity	-----	Gets frustrated when things don't go fast enough or according to own standards
	Is calm, stable, and steady	-----	is hurried, restless, unstable, chaotic
	Is unhurried in his/her work, and content to perform routine tasks over a long period of time	-----	Is hurried in own work and avoids routine tasks
	Is most comfortable with the familiar and accepting things exactly as they are	-----	Is constantly seeking new situations

Framework for observing self-directed learning readiness among full-time business students			
SDLR Characteristic	Behavioural indicator Self-Directed Learner	Please put a cross on the line identifying behaviour shown by student	Behavioural Indicators Dependent Learner
Self Modification	Applies what is learned in new contexts	-----	Is unaware of lessons learned, or how to apply what is learned to other contexts
	Utilises the skills that have been acquired to learn beyond the curriculum contents	-----	Does not utilise skills acquired, remains within curriculum contents only
Critical (self) reflection	Questions own assumptions, presuppositions and meaning perspectives	-----	Convinced of own assumptions, presuppositions and meaning perspectives; not open for reflection
Critical Thinking	Presents a specific personal position to a clearly formulated problem,	-----	Accepts general or first probable positions to a formulated problem
	Relates this position to alternative theories or perspectives within or outside the discipline	-----	Accepts this position as the best or only solution to the problem
	Justifies the position with evidence	-----	Accepts the position without further investigation
	Acknowledges the assumptions and limitations of the chosen position	-----	Trusts the assumptions despite or unaware of the limitations of the chosen position
Dealing with ambiguity	Makes a decisions when the result of that decision is uncertain, when the information available is partial or ambiguous, or when there is a risk of unintended outcomes	-----	Continues to seek for certainty prior to making a decision, Avoids risk of failure, Shows inactivity / steps back in fast-moving, uncertain situations
	Tests ideas, concepts and opinions frequently to reduce risks of failing	-----	Avoids risk of failure; avoids situations outside of comfort zone
Creativity	Develops several ideas and opportunities to	-----	Seeks examples of proven concepts to solve
	Explores and experiments with innovative approaches	-----	Prefers to rely on conventional (proven) concepts
	Combines knowledge and resources to achieve valuable effects	-----	Searches for best practices of valuable effects
Digital Literacy	Applies cognitive and technical skills to use information and communication technologies to find, evaluate, create, and communicate information	-----	Struggles with information and communication technologies to find, evaluate, create and communicate information

Criteria derived from: Guglielmino 1977; Long & Agyekum, 1983; Oddi, 1986; Brockett & Hiemstra, 1991; Grow, 1991; Garrison, 1997; Stockdale, 2003; Bouchard, 2009; Stockdale & Brockett, 2011; Doolan 2013; Harasim, 2017)