

AM I AN ENTREPRENEUR? STUDENTS' CREATIVE DISPOSITIONS  
AND ENTREPRENEURIAL INTENTIONS EXAMINED USING THE  
THEORY OF PLANNED BEHAVIOUR

by

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## ABSTRACT

This study has two major objectives. The first objective is measuring the impact of entrepreneurship education courses (EECs) on creative role identity (CRID) and creative self-efficacy (CSE), in addition to attitudes (ATTs) toward entrepreneurship, desires toward entrepreneurship, and entrepreneurial intentions (EIs/INT). The second objective is addressing some of the limitations of the theory of planned behavior (TPB) by incorporating new constructs into the traditional model to better theorize the process and testing a new 2\*2 model that is based in TPB. Using a pretest posttest quasi-experimental design, data were collected from a sample of 375 students at time 1 in comparison to 295 students at time 2 (both graduate and undergraduate) university-level students enrolled in entrepreneurship and non-entrepreneurship courses at three universities in eastern Canada. Two courses-derived benefits were examined, perceptions of formal learning (FL) and perceptions of creativity learning (CL). Results of a paired sample t-test showed that there were significant differences in the means of ATTs among the 115 students who attended the entrepreneurship courses at both time 1 and time 2, but in the opposite direction, and no significant differences in the means of other study variables. However, when conducting a univariate analysis, the results of the experimental group, in comparison to the control group, showed a significant increase in all the variables, except for ATTs and CSEs. Moreover, a FL had a significant influence on students' EIs. To test the second objective, I conducted structural equation model (SEM). It revealed that that while attitudes and desires had strong positive relations with EIs, CSE had a significant positive relationship with entrepreneurial desires. ATTs were significantly related to FL. Then, I proceeded to develop a unique model capturing the

cross-classification of attitudes and CSE on EIs. Findings showed significant differences between the outcomes of at least two profiles with students reporting high CSE and high attitudes showing highest in EIs. However, contrary to my prediction, attitudes proved to be the stronger predictor of entrepreneurial intentions in comparison to CSE. The study findings contribute to the development of TPB, the emerging field of integrated entrepreneurial intention models, and entrepreneurship education.

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# TABLE OF CONTENTS

ABSTRACT.....	ii
ACKNOWLEDGEMENTS .....	iv
TABLE OF CONTENTS.....	vi
LIST OF TABLES .....	ix
LIST OF FIGURES .....	x
GLOSSARY OF ABBREVIATIONS AND TERMS .....	xi
CHAPTER 1: INTRODUCTION.....	1
1.1 Setting the Scene and Organization of the Thesis.....	1
1.2 Background.....	2
1.2.1 The Growth of Entrepreneurship Education .....	2
1.2.2 The Challenges Facing Entrepreneurship Education .....	3
1.3 Research Goals and Objectives.....	7
1.4 Research Questions.....	11
1.5 Research Contributions.....	12
1.6 Chapter Summary .....	17
CHAPTER 2: LITERATURE REVIEW AND HYPOTHESES.....	18
2.1 Evaluating the Impact of Entrepreneurship Education .....	18
2.1.1 Formal Learning (FL) and Creative Learning (CL).....	20
2.2 Overview of The Theory of Planned Behaviour (TPB).....	22
2.2.1 TPB and Entrepreneurship Education.....	22
2.2.2 TPB and its Traditional Constructs .....	23
2.2.3 Limitations of TPB .....	29
2.2.4 Opportunities for Theory Expansion and Development .....	31
2.2.5 Addressing the Limitations of TPB .....	32
2.3 Entrepreneurial Desires.....	32
2.4 Entrepreneurship and Creativity .....	35
2.4.1 Creative Self-efficacy .....	36
2.4.2 Creative Role Identity .....	39
2.4.3 Self-Views of Past Creative Behavior .....	41
2.5 Research Hypotheses .....	42
2.6 Chapter Summary .....	59
CHAPTER 3: METHODS.....	60

3.1 Research Methods and Data Collection.....	60
3.1.1 Participants and Procedures .....	61
3.1.2 Statistical Analysis and Hypotheses Testing.....	64
3.2 Measures .....	69
3.2.1 Control Variables .....	69
3.2.2 Attitudes Toward Entrepreneurship (ATTs).....	71
3.2.3 Creative Self-Efficacy (CSE).....	72
3.2.4 Creative Role Identity (CRID).....	73
3.2.5 Self-Views of Past Creative Behavior (SVPCB) .....	73
3.2.6 Entrepreneurial Intentions (EIs/INT):.....	74
3.2.7 Entrepreneurial Desires (DES).....	74
3.2.8 Formal Learning (FL) .....	74
3.2.9 Creative Learning (CL).....	75
3.3 Chapter Summary .....	75
CHAPTER 4: RESULTS.....	76
4.1 Sample, Descriptive Statistics, and Model Fit.....	76
4.1.1. Sample.....	76
4.1.2 Descriptive Statistics of the Entire Repeated Sample .....	76
4.1.3 Descriptive Statistics of the Repeated Sample by Group.....	79
4.1.4 Descriptive Statistics of the Whole Sample .....	79
4.1.5 The Model's Validity and Reliability .....	90
4.1.6 The Model Fit Summary .....	99
4.2 Study Results .....	103
4.3 Chapter Summary .....	142
CHAPTER 5: DISCUSSION.....	143
5.1 Discussion of Goals (Revisiting Goals).....	143
5.2 Discussion of H1-H2B Outcomes and Contribution.....	144
5.3 Discussion of H3-H12D (The Hypothetical Model) Outcomes and Contribution.....	148
5.4 Discussion of H13-H13D (2*2 Model) Outcomes and Contributions.....	154
5.5 Overall Contribution and Theoretical Implications .....	156
5.6 Practical Implications.....	159
5.7 Study Limitations.....	162
5.8 Implications for Future Research.....	164
5.9 Concluding Remarks.....	167

REFERENCES .....	168
APPENDIX A.....	201
APPENDIX B .....	203
APPENDIX C .....	206
APPENDIX D.....	208
APPENDIX E .....	218
CURRICULUM VITAE	

## LIST OF TABLES

Table 1: Descriptive Statistics PRE/T1 (Repeated Sample).....	77
Table 2: Descriptive Statistics POST/T2 (Repeated Sample).....	78
Table 3: Correlations Among Primary Study Variables PRE/T1 (Repeated Sample).....	78
Table 4: Correlations Among Primary Study Variables POST/T2 (Repeated Sample)....	79
Table 5: Descriptive Statistics by GROUP PRE/T1 (Repeated Sample) .....	81
Table 6: Descriptive Statistics by GROUP POST/T2 (Repeated Sample).....	81
Table 7: Correlations Among Primary Study Variables by GROUP PRE/T1 (Repeated Sample) .....	82
Table 8: Correlations Among Primary Study Variables by GROUP POST/T2 (Repeated Sample).....	84
Table 9: Descriptive Statistics by GROUP * Prior (Repeated Sample) .....	86
Table 10: Descriptive Statistics by GROUP * OWN (Repeated Sample).....	86
Table 11: Descriptive Statistics by GROUP * PAR (Repeated Sample).....	86
Table 12: Descriptive Statistics by GROUP * ANY (Repeated Sample).....	87
Table 13: Descriptive Statistics by GROUP * Gender (Repeated Sample).....	87
Tables 14-22: Descriptive Statistics (Whole Sample) .....	88
Table 23: Standardized Factor Loadings-PRE/T1 .....	91
Tables 24A-I: Reliability Analyses-PRE/T2 .....	92
Table 25: Standardized Factor Loadings-POST/T2.....	95
Tables 26A-J: Reliability Analyses-POST/T2.....	96
Table 27: Model Fit Summary (PRE/T1) .....	100
Table 28: Model Fit Summary (POST/T2) .....	102
Table 29: Paired Sample Statistics .....	104
Table 30: Paired Sample Correlation .....	105
Table 31: Paired Sample T-Test .....	106
Tables 32A-E: Univariate Analysis of Variance .....	108
Tables 33A-D: Multiple Regression (Ind: CL & FL, Dep: INT) POST/EXP GROUP ..	112
Table 34: Regression Weights/ EXP POST.....	116
Table 35: Total Effects/ EXP POST .....	117
Table 36: Direct Effects/ EXP POST .....	119
Table 37: Indirect Effects/ EXP POST .....	120
Table 37A: Squared Multiple Correlations .....	121
Table 38: Tests of Mediation (ATT, DESIRE, INT).....	123
Table 39: Tests of Mediation (CSE, DESIRE, INT) .....	126
Tables 40A-L: Interaction Effects .....	130
Tables 41A-G Two Way Anova .....	135
Table 42: Hypotheses and Results .....	140

## LIST OF FIGURES

Figure 1: The Traditional Model of the Theory of Planned Behaviour .....	7
Figure 2: The Proposed Model of the Theory of Planned Behaviour .....	10
Figure 3: The Proposed 2*2 Model .....	10
Figure 4: The Hypothetical Model.....	53
Figure 5: Pre CFA Factor Loadings.....	65
Figure 6: Post CFA Factor Loadings .....	66
Figure 7: Post Model SEM-EXP.....	68
Figure 8: The Hypothetical Model Showing SEM Results .....	114
Figure 9: The 2*2 Model Post Results .....	135

## GLOSSARY OF ABBREVIATIONS AND TERMS

This glossary provides a brief overview of common abbreviations and terms used within this dissertation

<b>ABBREVIATION</b>	<b>TERM</b>
EE	Entrepreneurship Education
TPB	Theory of Planned Behaviour
CSE	Creative Self-Efficacy
ATT/ATTs	Attitude/Attitudes
EM	Entrepreneurial Mindset
PBC	Perceived Behavioural Control
EEC	Entrepreneurship Education Courses
CRID	Creative Role Identity
EI/INT	Entrepreneurial Intentions
SVPCB	Self-Views of Past Creative Behaviour
DES/DESs	Desire/Desires
FL	Formal Learning
CL	Creativity Learning
T1	Time 1
T2	Time 2
EEM	Entrepreneurial Event Model
SE	Self-efficacy
EEP	Entrepreneurship Education Programs

EXP	Experimental group of students
CTRL	Control group of students
OWN	A previous experience in owning or managing a business
PAR	Having a parent entrepreneur
PRIOR	A previous experience in attending an entrepreneurship course
IV	Independent Variable
DV	Dependent Variable
H	High
L	Low
SEM	Structural Equation Model
CMV	Common Method Variance
CFA	Confirmatory Factor Analysis

# **CHAPTER 1: INTRODUCTION**

## **1.1 Setting the Scene and Organization of the Thesis**

The influence of entrepreneurial activity on the economy of both industrialized and developing countries has been well documented (Aidis, 2005) in many streams of research, specifically in management literature (Zollo et al., 2017). Findings point to the role played by entrepreneurship in creating job opportunities, generating income, and fostering innovation (Heinonen & Poikkijoki, 2006; Miller et al., 2009). Consequently, entrepreneurship education (EE) is growing rapidly in universities and colleges globally and is expected to support a range of potential entrepreneurial outcomes (Nabi & Liñán, 2011). Commensurate with this growth, considerable research has been conducted to understand the processes that can lead to entrepreneurial behaviours (McNally et al., 2016). However, there is still a lack of consistent evidence demonstrating that EE helps to create more or better entrepreneurs, and conflicting results of both positive and negative outcomes (Martin et al., 2013). Debates still surround whether entrepreneurship can be taught and learned in universities (Henry et al., 2004). In addition to the dynamic, unique nature of entrepreneurship, methodological weaknesses in the entrepreneurship literature have contributed to these contradictory results (Rideout & Gray, 2013). Moreover, insufficient research has been conducted to provide a more developed version of the theory of planned behaviour (TPB; Ajzen, 1991), one of the most widely employed theories in studying entrepreneurial intentions and behaviours, as well as addressing its limitations (Audet, 2004). Shook et al. (2003), in their literature review, concluded that the field was fragmented and needed theoretical clarity and empirical precision. Within this context, my dissertation aims to address some of the limitations in the

entrepreneurship literature which have hampered scholars' abilities to conduct and interpret research with high levels of rigor.

This thesis is organized into five chapters. The first chapter provides the background, research questions, research objectives, the study's contribution to the literature, and a proposed model of the outcomes of the cross classification of creative self-efficacy (CSE) and attitudes (ATTs) toward entrepreneurship. Chapter 2 provides an in-depth literature review and the theoretical foundation of the hypotheses. Chapter 3 presents the research methods and statistical analyses. Results are presented in Chapter 4. Chapter 5 starts with stating my study goals and objectives. Then, results are discussed in detail with theoretical and practical implications in addition to the concluding remarks.

## **1.2 Background**

### *1.2.1 The Growth of Entrepreneurship Education*

The entrepreneurship education (EE) field has witnessed explosive growth over the last three decades (Fiet, 2001) since the delivery of the first entrepreneurship course at Harvard Business School in 1947 (Solomon, 2007). Several initiatives are designed to increase the numbers of university students taking entrepreneurship modules (Neck & Greene, 2011). Honig (2004) stated that almost every Association for the Advancement of Collegiate Schools of Business (AACSB) accredited institution, over 1400 postsecondary schools, teach EE as do 1600 higher education institutions in the USA. Governments worldwide seek to introduce a variety of programs to support entrepreneurship in higher education directly and through funding major investments (Martin et al., 2013). This growth reflects an increasing awareness that EE programs can support a range of potential entrepreneurial outcomes, such as enhanced student venture

creation skills, knowledge, attitudes, and graduate business start-ups as well as employment (Rideout & Gray, 2013).

### *1.2.2 The Challenges Facing Entrepreneurship Education*

Preparing students for a career in entrepreneurship is challenging (Boni et al., 2009). Major challenges facing EE relate to what constitutes entrepreneurship (Shane & Venkataraman, 2000). Welsh and Krueger (2009) emphasized that it took many years for the term “entrepreneurship” to be well conceived, which confirms the distinctive nature of entrepreneurship. Entrepreneurship is a multistage process that can be defined as “an activity that involves the discovery, evaluation and exploitation of opportunities to introduce new goods and services, ways of organizing markets, processes, and raw materials through organizing efforts that had previously not existed” (Venkataraman, 1997, p.7). The functions of the entrepreneur have evolved over time, from managerial tasks conducted by the owners of capital to innovation directed by non-owners (Śledzik, 2013). Theoretical perspectives have been modified accordingly. However, the common theme about the different perspectives of entrepreneurship is that it depends on an important condition, which is the decision by a person to respond to an opportunity. Therefore, educators are responsible for developing the discovery, reasoning, and implementation skills of students so that they can operate in uncertain environments and identify the right opportunity at the right time (Neck & Greene, 2011). Also, there are still disagreements about the best approach to teach entrepreneurship (Neck & Greene, 2011). Indeed, the use of different teaching philosophies and pedagogies is identified as one of the factors leading to the inconsistent results in impact studies on EE (Nabi et al., 2017). Fortunately, there is consensus, at least in theory, that entrepreneurship courses

should be taught in a different way from the traditional management courses (Neck & Greene, 2011).

The challenges facing EE provide promising future research opportunities, especially when research evaluating entrepreneurship education in general is still limited (Kailer, 2007). Despite the general positive assessment of EE (Pittaway & Cope, 2007) and spread of entrepreneurship courses and programs in universities, questions continue to arise in regard to the effectiveness of formal entrepreneurship education (Solomon et al., 2002). In addition, the standards of EE (Katz et al., 2016) and its legitimacy (Katz, 2003) as a research field have been frequently questioned in the literature. There are conflicting results in regard to EE impact (Piperopoulos & Dimov, 2015), as well as unclear evidence of its influence on students' entrepreneurial intentions (Nabi, Liñán, Fayolle, Krueger, & Walmsley, 2017). Literature reviews suggest that the contradictory findings of EE impact studies can be partly due to methodological or statistical artifacts such as cross-sectional survey methodology and lack of control groups and also the nature and context of pedagogical interventions as well as contextual factors (Bae et al., 2014). These results warrant a closer look at the mechanism through which EE influences students' attitudes and intentions toward entrepreneurship (Fayolle & Gailly, 2013).

The growing number of entrepreneurship studies has generally failed to highlight whether the skills and assets acquired in EE courses and programs actually promote the intention of students to become an entrepreneur (termed an “entrepreneurial mindset”, Oosterbeek et al., 2010). Some previous research focused on outcomes, such as nascent behaviors (Souitaris, Zerbinati, & Al-Laham, 2007), and start-ups (Fitzsimmons & Douglas, 2011). However, understanding entrepreneurship requires deep learning about

cognitive structures that drive attitudes and intentions (Ericsson & Charness, 1994).

Ireland, Hitt, and Sirmon (2003) highlighted the important role played by the entrepreneurial mindset (EM) in making sense of opportunities in the context of changing goals and a changing business environment. Entrepreneurial mindsets are also assumed to drive innovation in existing firms (Solesvik et al., 2013). Additional studies are required to examine whether university level EE encourages students to become entrepreneurs (Martin et al., 2013; Walter et al., 2013).

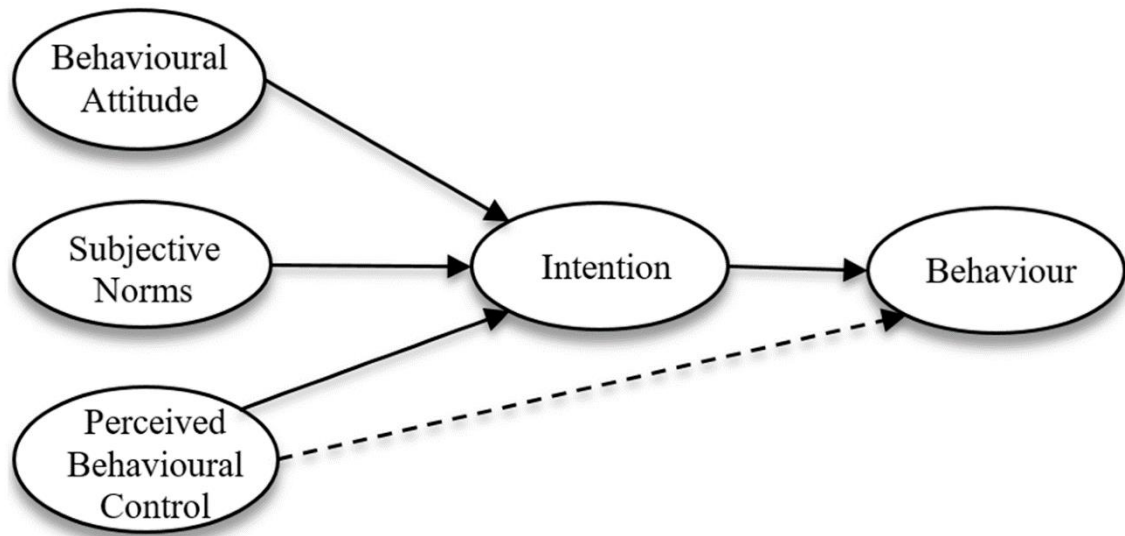
### *1.2.3 Entrepreneurship as an Intentional Behaviour*

Research into the effects of EE has mainly focused on entrepreneurial intent (Nabi et al., 2017) in relation to the theory of planned behavior (TPB; Lortie & Castogiovanni, 2015). This has offered a useful framework that can explain how EE might influence the entrepreneurial behavior of its participants (Fayolle, Gailly, & Lassas-Clerc, 2006). Intentions are defined as the temporal and causal cognitive state preceding an action (Krueger et al., 2000) and they lie close to the surface of our thinking. Entrepreneurial activities result from intentionally planned behaviour, thus justifying the wide employment of TPB to better investigate the antecedents of entrepreneurship behavior (Zollo et al., 2017). TPB was originally validated by Ajzen and Fishbein (1980). The theory states that an individual's actual behavior can be determined by his/her intention to carry out this behavior, and in turn this intention can be predicted by attitudes, including attitudes toward the behavior, subjective norms, and perceived behavioral control (PBC). PBC, which stems from the notion of self-efficacy, refers to one's degree of perceived control over the behaviour and its expected outcome in a particular situation (Zollo et al., 2017). While subjective norms refer to the individual's perceptions of social pressure to accomplish that behavior, personal attitudes refer to

individuals' beliefs about starting one's own business and evaluation of those outcome (Schlaegel & Koenig, 2014)

Although TPB (see figure 1) has long been considered one of the most influential theories in examining the outcomes of EE and studying entrepreneurship behavior, still some of the relationships between its constructs are hidden in a “black box” and pathways to intent are under-explored (Kickul & Krueger, 2005). There is still a need for further systematic research that helps to explain the role of cognition in the entrepreneur's development of his or her own perceptions of intentionality. Theoretical ambiguities remain due to the mixed support for these relationships in the entrepreneurship domain (McNally et al., 2016) as well as the inconsistency and lack of clarity of findings across many empirical studies (Mullen et al., 2009). However, one of the opportunities of the TPB model is that it remains open to the influence of exogenous variables that may affect the development of beliefs and attitudes (Schlaegel and Koenig, 2014).

**Figure 1: The Traditional Model of the Theory of Planned Behaviour (Ajzen, 1991)**



### **1.3 Research Goals and Objectives**

To fill the existing gaps in EE research, my first goal in my thesis is to evaluate the impact of entrepreneurship education courses (EECs), employing TPB, on students' creative role identities (CRIDs), creative self-efficacies (CSEs), attitudes (ATTs), entrepreneurial desires, and entrepreneurial intentions (EIs). This is because the real objective of education is to help learners structure their knowledge differently and thus develop how they view their self-efficacies and attitudes (Krueger, 2017). In particular, I measured how entrepreneurship students' cognitive states directed their desires, which "integrate a series of emotional, cognitive, self-perception, and social appraisals of the decision maker prior to intention formation" (Bagozzi et al., 2003, p. 276) and intentions toward forming a business venture. Previous studies assumed that the greater the strength of intention, the higher the probability of entrepreneurial activities (Botsaris & Vamvaka, 2016). According to Farmer et al. (2003), "a role identity reflects an internalized set of role expectations, with the importance of the identity being a function

of commitment to the relevant role” (p. 620). Creative self-efficacy refers to one’s belief in his/her ability to produce creative outcomes (Tierney & Farmer, 2002). Since the nature of the entrepreneurship process is dynamic, creative, and original (Kuratko, 2005), creativity related constructs are relevant to the discussion. The first goal of evaluating the impact of EE is broken down into three related objectives, which are highlighted in the literature as gaps for further inquiry in the EE field. The first objective is to address the call of Martin, McNally, and Kay (2013) to conduct future entrepreneurship research using pre- and post- EE interventions as well as treatment and control groups to improve the accuracy of assessing the impact of EE on entrepreneurship related outcomes. The confusion regarding the impact of EE may be the consequence of methodological weaknesses (Nabi et al., 2017). The second objective is to respond to the calls of several scholars (Nabi et al., 2017; Smith, Mitchell, & Mitchell, 2009; Solesvik et al., 2013) to drill down deeply to examine entrepreneurial thinking, which is currently very much in vogue (Krueger, 2017). Scholars in the EE field have turned their attention to entrepreneurial cognition (Krueger & Day, 2010) which sheds light on cognitive dimensions of entrepreneurship illuminating why some individuals are capable of exploiting opportunities (Solesvik, Westhead, Matlay, & Parsyak, 2013) and are more likely than others to engage in entrepreneurship. Examining cognitive processes, such as investigating one's beliefs of self-views of past creative behavior (SVPCB), CSE and CRID, illuminates the decision-making process to become or not to become an entrepreneur (Markman et al., 2002). The mental models underlying the cognitive approach provide promising opportunities for new means to address challenges EE faces by building competencies and increased confidence in students (Krueger, 2007). Also, creativity is a domain where scholars can see the impact

of brain-based science (Hansen et al., 2011). The third objective is to respond to Nabi et al. (2017) who called for the exploration of different pedagogical methods which are partially responsible for the contradicting findings regarding the impact of EE. Two course related benefits were examined in this study: perceptions of creativity learning (CL) supported in the course and formal learning (FL) regarding typical areas of entrepreneurship, such as opportunity recognition and evaluation, corporate entrepreneurship, and starting a business (Zhao et al., 2005).

The second goal is to provide a more developed version of the TPB and address its limitations. To achieve this goal, I first incorporated novel constructs, SVPCB, CRID, and CSE in the traditional model that could influence desires, also not included in the traditional model and intentions toward entrepreneurship. Figure 2 illustrates my proposed model of the theory of planned behaviour. The hypotheses are presented in detail in chapter 2. Then, I proceeded to develop a unique 2\*2 model (see Figure 3 ). In the 2\*2 model, I examined a cross-classification of CSEs and attitudes, arguing that together they define the different stages of EIs. The relatedness of the TPB and expectancy frameworks suggests that interaction effects might be expected in the context of entrepreneurial intentions. Steel and König (2006) proposed that expectancy theory can be integrated into the TPB framework (Ajzen, 1991) due to the similarity between behavioral intentions models and expectancy-valence models. Krueger (2017) suggested investigating the possibility of exploring intentional phase changes associated with changes in desirability and feasibility.

**Figure 2: The Proposed Model of the Theory of Planned Behaviour**

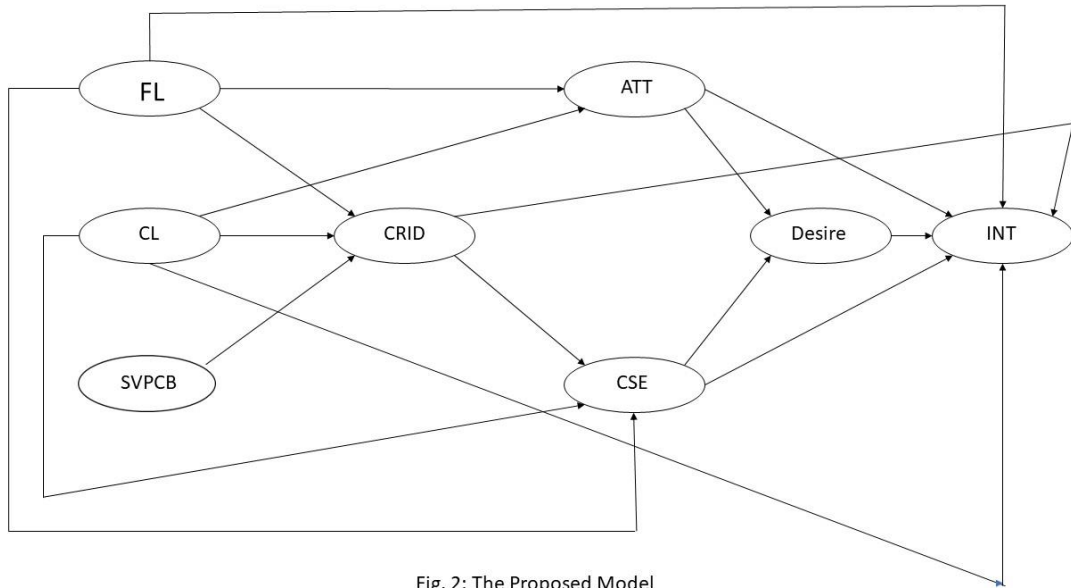


Fig. 2: The Proposed Model

**Figure 3: The Proposed 2\*2 Model**

	Low CSE	High CSE
Low ATT	4 Lowest INT	2 Second highest INT
High ATT	3 Third Highest INT	1 Highest INT

Fig. 3: The Proposed 2\*2 Model

## 1.4 Research Questions

My study main research questions are as follows:

- At the end of entrepreneurship courses (time 2/ t2), do perceptions of formal learning (FL) and creativity learning (CL) supported in the entrepreneurship education courses affect students' entrepreneurial intentions?
- Do students belonging to the experimental group develop higher levels of positive attitudes toward entrepreneurship, creative role identities, creative self-efficacies, entrepreneurial desires, and intentions at the end of the courses in comparison to the beginning of the courses?
- At time 2, do students belonging to the experimental group develop higher levels of positive attitudes toward entrepreneurship, creative role identities, creative self-efficacies, entrepreneurial desires, and intentions in comparison to students in the control group?
- At time 2 (see figure 2 for the proposed paths of relationships), do students belonging to the experimental group develop positive direct relationships within the context of the following:
  - FL & ATT, FL & CRID, FL & CSE, FL& desires, FL & INT/EI.
  - CL & ATT, CL & CRID, CL & CSE, CL & desires, CL & INT/EI.
  - SVPCB & CRID
  - CRID & CSE, CRID & EI/INT
  - ATT& desires, ATT& INT/EI
  - CSE & desires, CSE & INT/EI
  - Desires & EI/INT

## **1.5 Research Contributions**

Given that the education offered by universities can function as a motivational factor that transforms students' aspirations and attitudes into self-employment (Wang & Wong, 2004), investigating their entrepreneurial intentions gives important insights into how to nurture students' entrepreneurial thinking. Extensive work that attempted to examine the effectiveness of formal entrepreneurship education has been inconclusive (Cox et al., 2002) and the impact of EE programs remains largely unexplored (Karimi et al., 2016). The first goal of this study aligns with the need to further explore cognitive perspectives to better evaluate the efficacy of entrepreneurship education. Answers to the following questions are still scarce: Do entrepreneurship education courses (EECs) influence students' CRID, ATTs, CSEs, and consequently desires and EIs? Do perceptions of formal learning (FL) acquired from the course have a stronger effect on ATTs, CSEs, entrepreneurial desires, and EIs in comparison to perceptions of creative learning (CL) supported in the course? My research attempts to reduce these theoretical and methodological gaps regarding evaluating the impact of EE by adopting the following steps. First, I focused on studying the impact of EE using a relatively large-scale compulsory and elective entrepreneurship courses at three different universities to provide external validity. Then, I used a quasi-experimental pretest plus pretest/posttest methodology in addition to a control group. Other studies that include matched control groups (e.g. Ohland, Frillman, Zhang, & Miller III, 2004; Thursby, Fuller, & Thursby, 2009) are considered to rank the strongest studies evaluating the impact of entrepreneurship education programs. Employing quasi-experimental controls coupled with careful descriptions of the programs and the research samples would lead to a

substantial progress in the field (Rideout & Gray, 2013). In addition, my thesis addresses cognitive perspectives by focusing on creativity since it is central to entrepreneurship (Rauch et al., 2009). There are only a few studies that have adopted intervention designs in studying CSE (Robbins & Kegley, 2010). Possessing a sense of confidence in one's capability for creative work is a key to being creatively motivated (Kelley & Kelley, 2013). It is worth examining whether teaching and training interventions can gradually alter learners' beliefs, such as their beliefs in their own abilities (i.e., CSE) to be creative and who they are (i.e., CRID) in addition to their relationships with entrepreneurial desires and EIs. Also, CRID and CSE are malleable (flexible) and therefore should be amenable to different forms of training and intervention (Tierney & Farmer, 2011). Amabile (1998) emphasized that individuals can be trained to recognize opportunities and think creatively. Finally, my study examined the impact of two pedagogical models, formal learning versus creative learning, on EE outcomes, a recommendation proposed by Nabi et al. (2017) in their review of 159 published articles from 2004-2016.

By addressing the limitations of TPB and aiming to better theorize the process, my research answers the “What’s new?” question in theory building (Whetten, 1989). Previous studies proposed various enhancements to the TPB in other contexts such as weight loss (Perugini & Conner, 2000), eating at restaurants (Bagozzi & Lee, 2002), and blood donation (Armitage & Conner, 2001). The use of self-views of past creative behaviour, creative role identity, creative self-efficacy, and entrepreneurial desires contributes to the EE literature by examining novel impact indicators related to the entrepreneurship mindset, thus responding to the recent call of scholars in the field (Nabi et al., 2017). Schlaegel and Koenig (2014) emphasized that the literature mainly focused on direct relationships between EI and its determinants. Therefore, more research is

required to explore how beliefs, attitudes, and perceptions influence each other and cause individuals to hold more positive intentions toward starting a business (Schlaegel & Koenig, 2014). My contribution is to propose and test a coherent and integrated framework that can provide insights and help explain the different relations between the constructs involved. I examined for the first time CSE and CRID as new constructs of the EM that can positively influence entrepreneurial desires and EIs/INTs. To the best of my knowledge, this conjecture within this context has not yet been tested empirically. Studies found that individuals who viewed creativity as part of their individual identity profile reported a stronger sense of confidence in their creative capacity (Tierney & Farmer, 2011). I view the inclusion of creativity-related constructs as an important contribution to the literature on entrepreneurship intentions as well as entrepreneurship education assessment. Creativity is a factor that previously has not been well considered in intention-based models (Gundry, Ofstein, & Kickul, 2014; Hamidi, Wennberg, & Berglund, 2008). Also, integrating the self-identity construct, CRID, into the TPB-entrepreneurship research may indicate novel implications regarding how to foster entrepreneurial motivations more effectively. Moreover, several scholars called to examine these constructs in future research. For example, Farmer and Tierney (2017) and Zhang and Bartol (2010) called to consider different outcomes of CSE. Also, Obschonka, Silbereisen, Cantner, and Goethner (2015) identified the need to explore the role of identity in the motivation processes leading to entrepreneurial intentions and behaviors. As for self-views of past creative behaviour (SVPCB), Ouellette and Wood (1998) found robust evidence for the impact of frequency of past behavior on both intentions and future behaviors and called for more research to confirm their results.

Most intentions models just considered attitudes, subjective norms, and self-efficacy as the best predictors of entrepreneurial intentions (Yar Hamidi et al., 2008).

Another contribution of my research is considering the relationship between attitudes, desires, and intentionality. The classification into desires and intentions has been voiced in the entrepreneurship literature (Armitage & Conner, 2001; Bagozzi et al., 2003; Liñán & Chen, 2009). Desires seem to be related to the missing motivational link in the attitude-intention relationship (Bagozzi, 1992). I tested empirically how intentions that undergraduate and post graduate students hold toward entrepreneurial activities/ decisions go from implementation desires to behavioral intentions associated with cognitive differences (Krueger & Day, 2010). Some previous studies examined perceived desirability, attitudes, and intentions drawing on other theories than the TPB (e.g., Esfandiar, Sharifi-Tehrani, Pratt, & Altinay, 2019). This analysis contributes to the literature by examining a step wise process and a more relatively comprehensive and robust EI model than other studies on the topic.

As for the statistical analytical tools, I used structural equation model (SEM), a powerful statistical tool, to analyze the students' SVPCB, attitudes towards entrepreneurship, CRIDs, CSEs, DESIREs, EIs. SEM has started to gain popularity in the behavioral sciences (Shook et al., 2004). Even apart from evaluating the impact of EECs, SEM has the advantage of showing both the latent and observed relationships and paths among the different variables of the study.

My overall approach in applying TPB across the different hypotheses in my study is unique. I am not aware of any entrepreneurship/ EE research which examined interaction effects between CSE and attitudes within the context of TPB and EE. I developed a cross classification of CSE and attitudes (a 2x2 model) to explore their

combined impact on EIs (see Figure 3). The 2x2 model offers a different perception, rather than the traditional one of the antecedents of entrepreneurial intentions. In so doing, I challenge TPB's traditional treatment of its main constructs. The interaction effect between attitudes toward entrepreneurship and CSE within the context of TPB and entrepreneurship has not been studied so far. To this point, with the exception of very few studies, such as the study conducted by Fitzsimmons and Douglas (2011), only main effects are studied within the entrepreneurship, with no consideration given to interaction effects. In regard to new venture formation, Li (2011) found that the interaction between hope and regret accounted for 58% of the variation in the subjective value of forming a new venture. The resulting four profiles of intentions offer the following insights. First, they highlight differences between "would-be and perhaps sometimes later entrepreneurs, and entrepreneurial abstainers" (Holienka, Gál, & Kovačičová, 2017, p.1935), thus suggesting a novel typology of nascent entrepreneurs. The model highlights the importance of studying differences among different types of entrepreneurs, rather than merely emphasizing the differences between entrepreneurs and non-entrepreneurs (Amit & Muller, 1995). Second, the four profiles propose a dynamic model by which intentions may evolve and go through different stages as attitudes and creative self-efficacy beliefs go through different phases. Krueger (2017) called to investigate the possibility to explore intentional phase changes associated with changes in desirability and feasibility. Third, the model may have implications for EE as each of the resulting four profiles represent a cognitive phase which can be further nurtured by the influence of entrepreneurship education courses.

## **1.6 Chapter Summary**

This chapter discussed the rapid global growth of entrepreneurship education as well as the challenges facing it. The rationale for regarding entrepreneurship as an intentional behavior within the context of the theory of planned behavior was explored. Then, I presented an overview of my research goals and objectives, given the current challenges and research gaps in the field. The chapter concluded with an overview of research contributions.

## **CHAPTER 2: LITERATURE REVIEW AND HYPOTHESES**

Since one of my research goals is examining the outcomes of EE drawing on the model of TPB, I start the following subsections with a discussion of the approaches of assessing the impact of EE, including an explanation of two course related benefits, formal learning and creative learning. Then, I present an overview of TPB and elaborate on its validity for use within the context of university students and entrepreneurial behavior. Because I aim to address the limitations of TPB as another research goal, I discuss limitations of the theory which also provide potential opportunities for theory development. I explain how I plan to address the limitations and opportunities of the model by building a 2\*2 model and including novel creativity related constructs justified by the strong relationship between entrepreneurship and creativity. Within this context, I define the new variables that I proposed to include in the model, desires toward entrepreneurship, CSE, CRID, and SVPCB. Finally, I conclude this section with my research hypotheses.

### **2.1 Evaluating the Impact of Entrepreneurship Education**

There are different types of entrepreneurship education targeted toward particular stages of development and specific audiences (Liñán, 2004) ). EE consists of “any pedagogical [program] or process of education for entrepreneurial attitudes and skills” (Fayolle, Gailly, & Lassas-Clerc, 2006, p. 702). Most university-level entrepreneurship education programs are targeted toward students who have no prior entrepreneurial experience with the purpose of increasing entrepreneurial awareness and preparing aspiring entrepreneurs with the required skills (Bae et al., 2014). One critical implication is that learning processes can alter deep mental models in the direction of better

entrepreneurial thinking whether in terms of learning to see more/better opportunities or to perceive oneself as an entrepreneur (Nabi et al., 2018). Educational theory has demonstrated that there are two fundamental models of how humans learn, offering different prescriptions for teaching and training (Nabi et al., 2018). While the traditional model is behavioral in nature and focuses on acquiring information (facts), the constructivist approach to human learning enables students how to “connect the dots” and change their deep cognitive structures they need to make to become more experts (Dehler, 2009). EE has long owed its success to implicitly following the constructivist model. Monroy et al. (1995) were among the first to articulate that traditional classroom methods were less effective in comparison to other constructivist and experiential approaches which replicate the uncertainties and uncontrollable circumstances an entrepreneur faces in the real business world (de Castro Krakauer et al., 2017). Ward (2004) explains that depending on how knowledge is processed (cognition), knowledge will either provide a bridge to a new opportunity or construct a barrier that will prevent its path.

However, despite the spread of entrepreneurship courses and programs in universities worldwide over the past few years (Nowiński et al., 2019; Solomon et al., 2002), there are still doubts about the effectiveness of formal entrepreneurship education. In addition, the impact of these programs has remained largely unexplored (von Graevenitz et al., 2010). The results of previous studies are inconsistent (Karimi et al., 2016). While some studies indicated a positive outcome of EECs and entrepreneurship education programs (EEPs; Souitaris et al., 2007), others found a statistically insignificant or even negative influence (Oosterbeek et al., 2010). For example, Fayolle, Gailly, & Lassas-Clerc (2006) found that while entrepreneurship

programs had a positive influence on students with no prior entrepreneurship exposure, they had counter effects on students with a prior entrepreneurship experience. Similarly, Martin et al. (2013) concluded from their meta-analysis review that there was a small but positive relationship, which was a weighted correlation of 0.14.

There are different approaches to studying the impact of EE. One approach is to evaluate the efficacy of the EECs in terms of fulfilling their objectives (Bechard & Toulouse, 1998). Measuring the efficacy of training programs, from various perspectives, is regarded as one of the most widely studied evaluation issues (Fayolle & Gailly, 2013). Kirkpatrick (1959) evaluated training based on four interlinked levels, each level leading to the next. The evaluative model is the reference framework employed in the EE literature (Fayolle & Gailly, 2013). The first level is called “reactions” and measures the general feeling of the participants about various aspects of the training program. It is concerned with measuring the overall satisfaction levels of students. The second level, “learning”, assesses the skills and techniques acquired as well as changes in attitudes. While the third level assesses the changes in behaviour, the fourth level focuses on the results and consequences of the changes in behaviour (Kirkpatrick, 1996; Ostroff, 1991). My study focused on the second level of Kirkpatrick’s evaluation by studying the changes in attitudes, CRIDs, CSEs, desires and EIs/INT of the participating students. As for the entrepreneurship courses related benefits, I tested two relatively malleable factors, perceptions of formal learning (FL) and perceptions of creative learning (CL) which are defined in the following paragraphs.

*2.1.1 Formal Learning (FL) and Creative Learning (CL)*

Various pedagogical practices in entrepreneurship education courses can be related to mechanisms of self-efficacy, role identity, and entrepreneurship related

constructs development. To stimulate self-efficacy development, Stumpf, Dunbar, & Mullen (1991) stated that formal learning (FL) in entrepreneurship education courses and programs foster enactive mastery experiences through best business case competitions, simulated business exercises, and provision of venture capital to entrepreneurship students. In addition, entrepreneurship courses promote vicarious learning by offering the opportunity to observe successful role models and local entrepreneurs who can be invited to present lectures and remarkable case studies to students and can also work with students in their course projects (Zhao et al., 2005).

As for perceptions of creativity learning (CL) supported in universities and courses, creativity researchers emphasized that educational environments can affect young people's creativity (Amabile, 1996). Creative learning aims at encouraging students to think creatively where students develop new business ideas or come up with creative solutions (Gundry et al., 2014). In some cases, students can actually start new ventures during the educational program (Yar Hamidi et al., 2008). Discouraging students' ideas and being too critical may impede creativity among students (Chambers et al., 1977). Learning activities may include assigning course readings and lectures on topics related to idea generation and concept development, engaging students with creative role models, and providing training modules on creative thinking (Martinsuo, 2009). Since I applied an intention model, grounded in the theory of planned behaviour, to assess the impact of entrepreneurship education courses, the following sections provide an overview of the theory.

## **2.2 Overview of The Theory of Planned Behaviour (TPB)**

### *2.2.1 TPB and Entrepreneurship Education*

I drew on a novel view of Ajzen's (1991) theory of planned behaviour (TPB) by examining students' attitudes, self-views of past creative behavior, creative self-efficacies, creative role identities, desires, and entrepreneurial intentions, adopting a pretest-posttest control group design. The TPB model is widely examined in the entrepreneurial world (Schlaegel & Koenig, 2014) and prior empirical studies confirmed its validity for use with university students (Karimi et al., 2016). Specifically, previous research illustrated that the theory of planned behavior could be used to predict employment status choice intention as can be seen in Figure 1 (Kolvereid, 1996). Thus the evaluation, comparison, or generalization of the outcomes of educational interventions in this field are now possible (Rauch & Hulsink, 2015). Krueger and Carsrud (1993) were the first to apply the TPB in the specific context of entrepreneurship education. The six main models developed in this field were the Entrepreneurial Event Model (Shapero & Sokol, 1982), The Theory of Planned Behavior (Ajzen, 1991), Entrepreneurial Attitude Orientation (Robinson et al., 1991), Intentional Basic Model (Krueger & Carsrud, 1993), Entrepreneurial Potential Model (Krueger & Brazeal, 1994) and Davidsson's Model (Davidsson, 1991). Among these models, TPB (Ajzen, 1991) and the entrepreneurial event model (EEM; Shapero & Sokol, 1982) are the two most extensively tested competing theories that have been used to explain entrepreneurial intentions (Solesvik et al., 2012). However, in comparison to the entrepreneurial event model (EEM) as well as other models, TPB is the most commonly used model in explaining entrepreneurial behavior (Schlaegel & Koenig, 2014). Entrepreneurship is a deliberate behavior since it involves careful planning and thinking

(Bird, 1988) and consequently is applicable for intention models (Krueger, 1993). The availability of multiple theoretical and empirical works based on TPB encouraged me to choose it as a framework for my study. Therefore grounded in TPB (Ajzen, 1991), my research provides a theoretical explanation for the influence of a number of individual-level antecedents on the desire and intention to become an entrepreneur. The entrepreneurial intention represents the presence, more or less, of antecedents or predisposition to entrepreneurship (Miralles et al., 2016).

### *2.2.2 TPB and its Traditional Constructs*

TPB (Ajzen, 1991) is itself an extension of the theory of reasoned action (Ajzen & Fishbein, 1980). However, as Ajzen himself conceded, the theory of reasoned action would predict a narrow range of behaviours, purely volitional in nature. According to TPB, intention is the cognitive representation of one's apparent will to pursue a given behavior, and it is considered as an immediate antecedent of behavior (Alain & Gailly, 2013). As can be seen in Figure 1 (above), TPB states that an individual's actual behavior can be determined by his/her intention to carry out this behavior, and in turn this intention can be predicted by attitudes, seen as the weighted sum of perceived consequences and the likelihood of different outcomes of the behavior, including intrinsic rewards, subjective norms, and perceived behavioral control (Ajzen, 2002). The following paragraphs discuss the main traditional components of the TPB: intentions, attitudes, subjective norms, and perceived behavioral control (PBC).

#### *2.2.2.1 Entrepreneurial Intentions*

Due to the potential time-lag and self-reported response biases in longitudinal studies (Kautonen et al., 2015), I opted to use entrepreneurial intention (EIs/INT) as the proxy for actual behavior. Intention refers to aiming to start a business, which is a

planned behavior (Krueger et al., 2000). It can be simply perceived as another attitude, just more visible (Krueger & Day, 2010). Consistent with longitudinal studies conducted by Lee, Wong, Der Foo, and Leung (2011), entrepreneurial intentions are regarded as the most powerful predictors of how much effort one is planning to commit in order to carry out entrepreneurial behavior (Krueger et al., 2000). In comparison with personal and situational variables, they have proven to be the most effective predictors of planned behaviour (Krueger et al., 2000) because they direct future actions and affect individuals' choices (Krueger & Carsrud, 1993). Entrepreneurial intention (EI/INT) is defined as “the conscious state of mind that precedes action and directs attention toward entrepreneurial behaviors such as starting a new business and becoming an entrepreneur” (Morian, Gorgievski, Laguna, Stephan, & Zarafshani, 2012, p.165). It refers to the intention of an individual to start a new business, a previous and determinant element towards performing entrepreneurial behavior (Krueger, 2017). EI is crucial to understanding entrepreneurship as it is the first step in the process of discovering, creating, and exploiting opportunities (Gartner et al., 1994). Therefore, to ensure a steady supply of entrepreneurs, practitioners and academics need to explore how early-stage entrepreneurial intentions originate (Esfandiar et al., 2019). However, it has to be noted that although intentions are considered strong predictors of actual behavior, the strength of this predictive ability may be different between individuals, in that some people are more likely to go about actually fulfilling their intentions while some are not (Yar Hamidi et al., 2008). Personal and environmental factors, including those related to EE and entrepreneurship training, influence EIs (Lee, Lim, & Pathak, 2011).

#### 2.2.2.2 *Attitudes*

Attitude toward the behavior is the degree to which the behavior is positively or negatively perceived (Ajzen, 1991). According to Eagly and Chaiken (1993), attitude is a psychological tendency that is expressed by evaluating a certain entity with some levels of favor or disfavor. Whenever a behaviour is evaluated, individuals tap into their memory to retrieve the appropriate beliefs. Fishbein and Ajzen (1977) suggested that the change in attitude depended on how one evaluated something based on the attributes associated with it. They emphasized that information formed the basis for attitudes which could be changed through active participation and convincing communication. Thus, the role of EE is in equipping learners with tools and skills that enable them to evaluate the costs and benefits associated with a certain behaviour as well as the affections towards that behaviour (De Jong, 2013). There is some evidence that university courses can affect critical attitudes (Neergaard, 2012). These insights are parallel to other research results like those studied by Souitaris et al. (2007) as well as Peterman and Kennedy (2003) but obtained with a very different approach. In comparison to EIs, fewer studies exist examining the relationship between EE and level 1 and 2 variables, such as attitudes (Chang et al., 2014). While most studies indicated a positive relationship between the entrepreneurship education program and level 1 and 2 variables, other research suggested that relationships were not significant or even negative (Nabi, Liñán, Fayolle, Krueger, & Walmsley, 2017). For example, Lanero, Vázquez, Gutiérrez, and García (2011) indicated the absence of a significant link between EE and entrepreneurial attitudes among Spanish students. Other studies, such as the one conducted by Mentoor and Friedrich (2007) reported a negative link between EE and attitudes toward entrepreneurship among South African students. These

contradicting results call for further research examining the context specificity of EE influence (Nabi et al., 2017). Several authors studied the effect that an individual's attitude may have on his or her intentions to carry out a certain conduct (Lechuga Sancho et al., 2018). For example, Arshad, Farooq, Sultana, & Farooq (2016) looked at the differentiated effects of entrepreneurial self-efficacy and social norms on individuals' business intentions through the mediation of entrepreneurship attitude, integrating the framework of gender scheme theory with planned behavior theory. Previously, Jan, Lu, & Chou (2012) studied the impact of coercive, normative and mimetic pressure on individual intentions to adopt e-learning systems through the mediation of attitudes towards e-learning systems. Bang, Ellinger, Hadjimarcou, & Traichal (2000) explored the impact of belief on the consequences of renewable energy on an individual's behavioral intent through the mediation of attitude towards action. However, most main effects of attitudes were studied on several occasions from a mediation point of view.

#### *2.2.2.3 Subjective Norms*

Subjective norms (SN) are defined as “perceived social pressure to perform or not to perform the behavior” (Ajzen, 1991, p. 188). Examining subjective norms is outside the scope of this study. Zhang et al. (2014) stated that this factor is difficult to capture for subjects with a highly internal locus of control or a strong orientation toward taking. Regarding the pattern of relationships in the model, the role of subjective norm in TPB is generally weak and specifically unclear in the area of entrepreneurship (Esfandiar et al., 2019). While some studies omitted subjective norm (Veciana et al., 2005), others found it to be non-significant (Autio, H. Keeley, Klofsten, GC Parker, & Hay, 2001; Krueger, Reilly, & Carsrud, 2000). In the field of entrepreneurship research,

Liñán and Chen (2009) mentioned that only 7 out of the 16 studies included SNs in the analysis. Two studies out of the five studies performing regression analysis found SN to be non-significant (Krueger et al., 2000). The existence of interactions and indirect effects of SN on intention could be explaining these results (Zhang et al., 2014)

#### *2.2.2.4 Perceived Behavioral Control*

Perceived behavioural control (PBC) was suggested as a second determinant of behaviour to the extent that it should directly influence behaviour based on the perceptions of actual control (Armitage & Conner, 1999). This concept was introduced into TPB to reflect the non-volitional elements inherent in entrepreneurial behavior (Ajzen, 2002). Overall, PBC refers to an individual's beliefs about ease or difficulty of performing a behaviour (Ajzen, 1991) based on the possession of required resources as well as abilities (de Jong, 2013) and attributing the causes of successes or failures to either internal factors or external factors (Rotter, 1990). PBC entails components that reflect both self-efficacy (SE) and controllability which are measured by means of different indicators (Ajzen, 2002). However, this similitude of controllability has been questioned (Rodgers et al., 2008) and is beyond the scope of this study. Perceived self-efficacy refers to “people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives” (Bandura, 1991, p. 257).

According to the social–cognitive theory, self-efficacy represents a central mechanism of personal agency which influences not only one's level of effort and persistence, but also one's choice of activities and behavioral settings (Bandura, 1986). Self-efficacy, in general, is relevant to the model as it impacts our courses of action and how long we persevere in the face of obstacles (Bandura et al., 1999). High self-efficacy expectations regarding performance in a specific behavioral settings encourage people to

approach that setting, whereas low self-efficacy expectations encourage people to avoid that setting (Wood & Bandura, 1989). According to Bandura and Locke (2003), the strongest factors that serve as motivators are “rooted in the core belief that one has the power to produce desired effects, otherwise one has little incentive to act or to persevere in the face of difficulties” (p. 87). Self-efficacy varies in important ways from the concept of “locus of control.” Locus of control refers to individuals’ general beliefs in the power of their own actions across different situations, while self-efficacy refers to an individual’s self-confidence in certain tasks and situations (Boyd & Vozikis, 1994). While perceived self-efficacy accounts for significant variance in intentions, beyond attitudes and subjective norms, and in behavior, over and above intentions, controllability adds further to the prediction of behavior but not to the prediction of intentions (Ajzen, 2002).

The focus on self-efficacy related measures is well justified in my study as most educators are aware that students need to internalize a corresponding level of SE beliefs in order to deploy new knowledge and especially new behaviors (Kickul & Krueger, 2005). The common theme among the different perspectives on entrepreneurship is that it depends on an important condition, which is the decision by a person to respond to an opportunity and overcome the social and psychological barriers (Shane, 2003). In addition, the concept of self-efficacy is extensively used in the career theory literature to explain career options, career preferences, and career-oriented behaviors (Betz & Hackett, 1981). The self-efficacy construct is suitable for the study of entrepreneurship in particular because of its nature as a task-specific construct that includes an evaluation one undergoes in regard to internal factors and external aspects in the surrounding environment in addition to being close to action and action intentionality (Boyd &

Vozikis, 1994). Finally, since I examined entrepreneurship intentions and not behavior, I focused only on measurements of self-efficacy, particularly creative self-efficacy, CSE, which is defined as “the belief one has the ability to produce creative outcomes” (Tierney & Farmer, 2002, p. 1138). The challenging nature of entrepreneurship necessitates creativity and discretion in terms of addressing problems when they arise. Therefore, creative self-efficacy is a promising potential candidate to examine as there is a growing empirical evidence of direct and reciprocal links between efficacy beliefs and creativity-related outcomes including initiation of and participation in independent projects, creative thinking and challenge seeking (Nabi et al., 2018a).

### *2.2.3 Limitations of TPB*

Although TPB allows us to test how various EE courses, with different pedagogical approaches, can influence one or several antecedents of intention and help in its evolution (Fayolle, Gailly, & Lassas-Clerc, 2006), there is a broader need for ongoing development and testing of methods and measures (McNally et al., 2016). These perspectives agree with the perception of Whetten (1989), "Most organizational scholars are not going to generate a new theory from scratch" (p. 493); instead scholars would rather develop a theory by challenging and extending the current state of knowledge. There are many questions in regard to assigning the same level of importance to all the elements in Ajzen's (1991) theory when assessing the impact of EE (Fayolle, Gailly, & Lassas-Clerc, 2006). While several meta-analyses show that attitudes, subjective norms, and PBC predict intentions (Armitage & Conner, 2001), the variance in intentional ranges differs from 28% to 40%, which is far from perfect (Rise et al., 2010). Some of the criticisms refer to the inability of its exogenous variables to explain entrepreneurial intention as strongly as the exogenous variables in Shapero's

model of the entrepreneurial event (Shapero & Sokol, 1982). Also, some studies question and undermine the expectation that intentions will predict entrepreneurial behaviour (Nabi et al., 2018). Scholars frequently criticize TPB for insufficiently considering other possible emotional, affective, and cognitive processes (Ajzen, 2011). For example, past behaviour and self-identity are not incorporated in the model. In opposition to other empirical work, Ajzen (1991) criticized the use of past behaviour stating that it did not add an explanatory content. He argued that including PBC in the model should eliminate the need for past behaviour, since PBC was expected to mediate any residual effects of past behavior. Also, TPB does not differentiate between desires and intentions but proposes that intentions result directly from the joint impact of attitudes, subjective norms, and perceived behavioural control. Similarly, the predictors included in Shapero's entrepreneurial event model (EEM) ignore the motivational component of intention, a critique that has been voiced recently in the context of entrepreneurship (Van Gelderen et al., 2015). Attitudes, subjective norms, and PBC provide reasons for acting, but do not include enough motivational content to induce an intention to act. Bagozzi (1992) argued that the TPB did not explicitly incorporate a motivational component that described the motivational process causing the three predictors to form intentions, thus failing to consider how intentions become energized. Furthermore, Bagozzi proposed that an individual's desire to perform a behavior might mediate the relationship between attitudes and intention. Finally, applying TPB to study a heterogeneous group of individuals such as students may be tricky as the theory is initially designed for the study of individuals (Fayolle & Gailly, 2015).

#### *2.2.4 Opportunities for Theory Development*

The TPB model may be affected, mediated or moderated by other variables or situational factors that influence the relationship between its traditional predictors and intention (Mathur, 1998). In response, scholars proposed extending TPB through the inclusion of different constructs, taking into account the theoretical models of entrepreneurial intention, to help explain how the current predictors influence intentions (Ajzen, 2011). For example, Schlaegel and Koenig (2014) called for future research to identify different determinants that explain differences in EI beyond that accounted for by the TPB and EEM antecedents. Bagozzi (1992) and Krueger and Day (2010) called for an investigation of the cognitive differences associated with intentional phases starting with implementation desire to behavioral intentions (Armitage & Conner, 2001). Krueger and Day (2010) suggested that intentions toward entrepreneurship could follow a similar pattern just as entrepreneurial ventures moved from ideation to nascency to launch. Accordingly, many intentions studies suggested that future research grounded in TPB should examine how intentions change, as only a handful have done so (Brannback et al., 2007).

In addition to the recommendation of adding new constructs to the theory, other scholars hypothesized an interaction between attitude and subjective norms to address some of the limitations of TPB (Grube & Morgan, 1990). Such an approach makes sense. Some of the leading theories of attitude maintain that both attitudes are not sufficient determinants of intentions as the attitude-intention link is expected to depend on conative processes and on particular coping responses targeted at the emotional significance of evaluative appraisals (Bagozzi, 1992). Armitage & Conner (2001)

identified 19 studies that looked at the intention\*perceived control interaction effects with respect to the consumption of drugs. Fitzsimmons and Douglas (2011) examined the interaction between perceptions of desirability and feasibility among a sample of 414 MBA students taking an entrepreneurship course in Australia, China, India, or Thailand. They called to explore potential avenues for further research to replicate their study in other national contexts and across more widely representative samples.

### *2.2.5 Addressing the Limitations of TPB*

My study addresses TPB research gaps and limitations by testing a new 2\*2 (see figure 3) model and by adding new variables to the traditional TPB model above. Drawing on TPB as an entrepreneurial model with a cognitive basis (Mitchell et al., 2002), I examined FL, CL, SVPCB, CSEs, and CRIDs in addition to attitudes and EI. Since intentions can evolve, giving the possibility for intentional phase changes across the process of learning especially for complex behaviors (Krueger & Day, 2010), I looked at desires as well. The following paragraphs conceptualize the following study variables: SVPCB, CSEs, CRIDs, desires, FL, and CL, highlighting the importance of desires and creativity related constructs in the intentions' models of entrepreneurship.

## **2.3 Entrepreneurial Desires**

A considerable body of work and research in attribution theory suggests that desires are necessary antecedents to intentions in models of goal-directed behavior. Similarly, in the theory of self-regulation, desires are hypothesized as proximal causes of intentions (Madden et al., 1992). A desire implies a motivational commitment to do something and it has long been regarded as the central impetus for intention formation (Mele, 1995) which serves to integrate a series of emotional, cognitive, self-perception, and social appraisals before intention formation (Bagozzi et al., 2003). Perugini and

Bagozzi (2001) stated that implementation desires were goal oriented and they mediated and transformed the effects of reasons and motives for acting and affected implementation intentions. Bagozzi et al. (2003) examined the impact of the decision-making process on subsequent goal striving and decision enactment among undergraduate students in two phases (across a period of almost two weeks). Previous entrepreneurial intent research used this argument to integrate the TPB and the entrepreneurial event model (Tkachev & Kolvereid, 1999). Iakovleva and Kolvereid (2009) integrated some parts of the two models, TPB and EEM. Similarly, Schlaegel and Koenig (2014) focused on the role of desire as a mediating variable for the influence of the original TPB antecedents of EI.

Brand (1984) clearly differentiated between intentions and desires stating that intending was more closely connected to action than desiring since intentions did not fully represent the preceding motivational process energizing a course of action (Bagozzi et al., 2003). While Fishbein and Stasson (1990) argued that desires could be perceived as a proxy of intention, Bagozzi, (1992) stated that intention implied desire, but that desire did not necessarily imply intention. This perspective was supported by Brand (1984) who stated the possibility of having opposite desires but not opposite intentions since intentions were more closely connected to action than desires. There are theoretical reasons for distinguishing between desires and intentions based on the following criteria: perceived performability, action-connectedness, and temporal framing differentiating the two constructs (Perugini & Bagozzi, 2004). I examined the following measures: desires (“I want to . . .”), and behavioral implementation intention (“I intend to . . .”).

Desires are goal-related and can be defined as a mental state in which individuals' reasons to perform a behavior are transformed into their motivation to perform the behavior (Perugini & Bagozzi, 2004). According to Mellers and Chang (1994), desires are psychological states that reflect what one wants or wishes, whereas intentions are what one plans to do. The antecedents in the TPB provide rational reasons for acting, may be significantly correlated with intentions, but do not incorporate explicit motivational content needed to induce an intention to act (Bagozzi & Dholakia, 2006). Although early studies attempted to account for this omission and included the concept of perceived desirability and propensity to act (Krueger et al., 2000), they failed to distinguish desirability as an attitude from desires as a motivation. Attitudes towards a behavior in the TPB, or the 'perceived desirability' construct in the entrepreneurial even model, are evaluative appraisals of an action which need to be accompanied by a desire to act to induce intention (Perugini & Bagozzi, 2001). Bagozzi (1992) suggested that attitudes may first be translated into desires since personal motivation was a key element causing and leading to intention formation (Perugini & Bagozzi, 2004). Scholars argued that changing perceptions of feasibility and/or desirability should lead to changes in intentions (Krueger, Reilly, & Carsrud, 2000). There has been an increasing evidence to suggest that moving from volitional to non-volitional requires examining different measures of pre-intentions and intentions (Fishbein & Stasson, 2006). Since my study contributes to our understanding of entrepreneurial behavior by showing that desires toward entrepreneurship as well as creative dispositions are important antecedents of entrepreneurial intentions, the following sections discuss the relationship between entrepreneurship and creativity and the creativity related constructs included in my study.

## **2.4 Entrepreneurship and Creativity**

My study captured a model of entrepreneurial intentions by shedding light first on the path from attitudes and CSE to desires and then from desires to EIs. I also investigated the direct paths from attitudes, CRID, and CSE to EIs. Before defining the creativity related constructs in my study, I discuss the logic supporting their inclusion in the TPB model. There is a long tradition of describing entrepreneurship and innovative business behavior as an act of creativity (Ward, 2004). Schumpeter (1934) perceived entrepreneurship as an act of creativity which created new opportunities by combining resources in new ways (Gundry, Ofstein, & Kickul, 2014). This perception agrees with perceptions of contemporary scholars who view creativity as central to entrepreneurship (Rauch et al., 2009). For example, Baron (2006) suggested that entrepreneurial alertness rested on cognitive capacities possessed by creative individuals who imagined new products and services and identified new solutions to market. One may claim that in perceiving such possibilities and opportunities is in fact creating them. Even entrepreneurial intentions were categorized as innovating intentions in some studies (Montalvo, 2006). Therefore, a critical part of entrepreneurship is the newness and novelty that can influence the market process (Davidsson, 2002). Entrepreneurs bring new goods or services, resulting from different ideas, to the market (Yar Hamidi et al., 2008).

While entrepreneurship and innovative behavior have long been associated with creativity (Nyström, 1993), my research offers the first comprehensive test of the relationships between CRID, CSEs, desires, and EIs within the context of EE. The awareness of the importance of creativity in discovering and exploiting opportunities that make entrepreneurs more competitive and innovative in their firms (Fillis &

Rentschler, 2010) has proliferated interest in acquiring and enhancing creativity in the entrepreneurship classroom. An analysis of entrepreneurship programs shows that 82% of program directors and chairs regarded creativity as an important component in the entrepreneurship curriculum (Gundry et al., 2014). According to a study of fifteen leading US entrepreneurship education programs (Solomon et al., 2002), the main goal for the majority of the programs is to foster the awareness and understanding of entrepreneurship as a process. The second main goal is to increase students' intentions toward entrepreneurship and self-employment. Yet it remains to be investigated whether university entrepreneurship education programs are effective to raise students' CRIDs and CSEs and whether these creativity related outcomes can raise their desires and EIs. One of the few studies linking creative dispositions to EIs examined students' perceptions of creativity and EIs (Zampetakis, Gotsi, Andriopoulos, & Moustakas, 2011). Another research is the one conducted by Yar Hamidi et al. (2008) who studied the impact of career experiences and personal creativity on the development of entrepreneurial intentions. However, they viewed their results as tentative, since they employed personality theories which are weak determinants of specific behavior (Wiklund & Shepherd, 2003). Therefore, they called for additional research on the creative dispositions among entrepreneurship students to confirm their findings.

#### *2.4.1 Creative Self-efficacy*

The entrepreneur disrupts the current market state by creating a different world and looking for creative solutions (Kirzner, 2009). Generating creative ideas involves persistence (Farmer & Tierney, 2017). Specifically, a sense of self-efficacy in creative activities can assist in removing obstacles preventing creative engagement (Gist &

Mitchell, 1992). Therefore, examining creative self-efficacy (CSE) is worthwhile since entrepreneurs face several obstacles beginning with challenging the dominant cultural routines and existing mental frameworks (Krueger & Day, 2010). CSE is an elaboration of Bandura's (1991) broader self-efficacy construct. Tierney and Farmer (2002) developed the construct of creative self-efficacy by building on Gist & Mitchell's (1992) conceptual framework for work-related self-efficacy. Given the degree of difficulty and risk that often accompany the entrepreneurial activity, a strong belief in one's ability to persevere and succeed is vital to students' decisions to engage in such activity. In my study, I looked at desires and entrepreneurial intentions as possible outcomes of CSE. Bandura (1997) recognized a possible relation between self-efficacy and creative behavior:

Creativity constitutes one of the highest forms of human expression.

Innovativeness largely involves restructuring and synthesizing knowledge into new ways of thinking and of doing things. It requires a good deal of cognitive facility to override established ways of thinking that impede exploration of novel ideas and search for new knowledge. But above all, innovativeness requires an unshakeable sense of efficacy to persist in creative endeavors. (p. 239)

Although CSE should fall within the spectrum of self-image characterizing creative individuals, it is different from other self-views (Tierney & Farmer, 2002). While self-esteem and confidence are broad, more general feelings, self-efficacy is a specific area capacity judgment (Bandura, 1997). In other words, a person can have high self-efficacy in one area, but low self-efficacy in another. Creative self-efficacy also differs from general self-efficacy, which reflects overall beliefs in one's capability across domains (Bandura, 1986). CSE is also different from other motivational paths, such as

intrinsic motivation which is one of the most commonly discussed attributes associated with creative activities (Shin et al., 2015). While intrinsic motivation is regarded as relatively stable, CSE is a self-regulatory state subject to considerable fluctuation (Farmer & Tierney, 2017). In addition, other motivational paths operate through different mechanisms as CSE can operate by affecting outcome expectancies (Malik et al., 2015). Previous research found that creative self-efficacy was positively associated with employee creativity (Binnewies et al., 2009). For example, Liao, Liu, and Loi (2010) indicated a positive relationship between creativity and efficacy from a sample of 828 employees. Studies examined other forms of self-efficacies within the context of entrepreneurship education and startups. This line of inquiry started when Boyd and Vozikis (1994) theorized that self-efficacy in performing tasks influenced the development of entrepreneurial intentions. Other scholars, such as Zhao, Seibert, and Hills (2005) examined the mediating role of entrepreneurial self-efficacy on the development of EIs, a replicated hypothesis of earlier findings. Markman, Balkin, and Baron (2002) assessed general self-efficacy in the context of the new venture formation.

Examining CSE as a specific form of self-efficacy aligns with Bandura's (1997) argument that self-efficacy should be focused on a specific context and activity domain to improve its predictive role in regard to task specific outcomes. Only a few studies examined changes in specific self-efficacy (Parker et al., 2006). Task-specific efficacy variables important to entrepreneurship include entrepreneurial and creative self-efficacy (Gibbs, 2014). In my study, I focused on CSE within the context of EE. Linking CSE to education relates to Nickerson's (1999) view of the impact of education experiences on the development of creative tendencies and processes which can include cognitive enhancement entailing an orientation toward the use of a variety of perspectives

(Perkins, 1986). Theory states that targeted education can play an influential role in developing levels of self-efficacy (Wilson et al., 2007). According to Bandura (1992), self-confidence to successfully perform certain tasks originates from four major sources: mastery experiences, modeling, social persuasion, and judgments of our own physiological states. Further research is required to explore self-efficacy views in naturalistic settings over time (Bandura & Locke, 2003). Within the context of EE in particular, self-efficacy in general is rarely used as an outcome measure (Wilson et al., 2007). For example, only very few studies have explored the impact of entrepreneurship education on enhancing entrepreneurial self-efficacy, such as the study conducted by Chowdhury and Endres (2005). It has been noted that these studies have been limited in scope and had inconclusive findings (Wilson et al., 2007).

#### *2.4.2 Creative Role Identity*

Creative role identity (CRID) is defined as a self-view reflecting identification with the role of being creative and perceiving creative activity as a central component of who one is (Farmer et al., 2003). As for the inclusion of CRID, understanding *the self* is one promising research area within cognitive entrepreneurship (Krueger & Day, 2010) "How we see ourselves—who we think we are—has a great deal to do with how we act" (Farmer, Tierney, & Kung-McIntyre, 2003, p. 618). Also, the sense of CSE is often grounded in self-identification with that domain (Tierney & Farmer, 2011). Mental prototypes of "entrepreneur" are based on deeply seated assumptions (Baron & Ensley, 2006), such as the role identity which has not been adequately examined in the entrepreneurship literature (Krueger & Day, 2010). Krueger (2007) called to examine deep cognitive structures that triangulate "role identity with quantitative measures of

entrepreneurial intentions and attitudes” and also incorporate “critical developmental experiences” (p. 130). Cardon, Wincent, Singh, & Drnovsek (2009) called for research to examine the potential influence of a self-concept-based approach on predicting entrepreneurial action and outcomes. Hoang and Gimeno (2010) found that possible identities, within the context of entrepreneurship, could “guide and motivate goal-oriented behavior, often to the extent that a possible role becomes an actual one” (p. 44). Some studies addressed role issues in the context of entrepreneurial intentions and attitudes (Autio et al., 2001). A number of TPB studies integrated self-identity into the TPB framework to examine unique main effects of self-identity in non-entrepreneurial behaviors (Rise et al., 2010). However, there is still a need for further research that embeds identity, a relatively novel construct in entrepreneurship research, into established models and theories of entrepreneurial intentions and behavior (Obschonka et al., 2015). To the best of my knowledge, no published entrepreneurship research to date has examined changes in CRID within the context of TPB and its reflections on CSE development and entrepreneurial intentions.

CRID is a self-view to oneself in relation to a particular role (Burke & Tully, 1977). Creating self-meaning by a role identity reflects a self-regulatory process of sense making in which inputs from others and oneself are reconciled to support, validate, and verify one's identity (Riley & Burke, 1995). A major assumption of identity theory is that self-identity directs and motivates action (Stets & Burke, 2000). This proposition aligns with self-consistency theories such as theory of cognitive dissonance which states that people try to avoid inconsistencies between their desires on one side and decisions and behaviors on the other side (Festinger, 1962). These propositions provide justifications for inclusion of self-identity as a predictor in TPB. A role identity can

develop as it undergoes an interpretation process of past and present role activity (Grube & Piliavin, 2000). Farmer et al. (2003) discussed the impact of the exposure to certain educational techniques on the development of CRIDs among a sample of Taiwanese employees exposed to certain educational techniques embedded in the US culture. Their results showed that a contact with a setting that supports creativity learning enhances CRID. Many entrepreneurship studies called to shed the light on the role of educational programs in fostering particular characteristics, such as different forms of role identity, but very few have actually investigated it (Obschonka et al., 2015). In response to the call of entrepreneurship scholars and aligning with research results supporting the malleability of CRID. I examined its development within the context of EE. Since a sense of role identity originates from associated self-views (Riley & Burke, 1995), I examined SVPCB which have properties similar to schemas and beliefs (Swann & Seyle, 2005).

#### *2.4.3 Self-Views of Past Creative Behavior*

Generally, the perceptions people hold, of either their overall ability or specific performance, tend to be modestly correlated with their real performance (Ehrlinger & Dunning, 2003). According to Stryker (1987), self-schemata reflect self-expectations which affect the formation of a role identity. Markus and Wurf (1987) emphasized that one source of self-attributions was a retrieval of past behavior episodes which impacted role identity. In turn, role identity influences intentions to continue to develop (Charng et al., 1988). Consequently, I incorporated past behaviours into the model (i.e., SVPCBs) to see what the effects of past behaviour may present on CRID. Although Ajzen (1991) excluded the use of past behavior in his TPB model, he still recognized its role in providing a methodological control in tests of any theory. In the psychological TPB

literature, there are strong theoretical and empirical reasons suggesting the inclusion of perceptions of past behaviors in the model (Conner & Armitage, 1998).

## **2.5 Research Hypotheses**

All the research hypotheses and results are summarized in Table 42. All the hypotheses were tested employing students from who completed the questionnaires at both time 1 and time 2. Most empirical studies indicate that at least some aspects of entrepreneurship can be taught making education one of the key instruments for fostering attitudes, intentions, as well as other competencies (Harris & Gibson, 2008; Martin et al., 2013). The intentions-based model is very relevant when trying to evaluate the impact of EE, an exogenous factor, on moulding intentions by initially shaping attitudes (Krueger et al., 2000). As suggested by Tkachev and Kolvereid (1999), “entrepreneurial intentions are determined by factors that may be altered. [. . .] [C]ourses in entrepreneurship, education in small business management and network programmes aimed at changing values, attitudes and norms are likely to have a positive effect” (p. 279). Initial levels of constructs/ variables, such as initial levels of intentions, have been shown in the literature to influence the impact of a training program (Fayolle & Gailly, 2015) . Fayolle and Gailly (2015) found that there is a significant correlation between the initial intention and other predisposition factors and the impact of the EEP on the students’ entrepreneurial intention and its antecedents, thus highlighting the importance of including initial values as covariates in testing my hypothesis. Therefore, H2A takes more particularly into account initial levels of creative role identities, creative self-efficacies, attitudes, desires, and intentions. Other scholars, such as Souitaris et al. (2007) used initial levels of intentions as control variables in some of their hypotheses, assuming that students with higher initial intention values would have less room for

increase. Also, many reviews in the literature suggest that the lack of pretest- posttest control group designs play a critical role in the contradicting results of the impact of EE (Bae et al., 2014). Drawing on the claim that the major goal of EECs and entrepreneurship education programs is to increase students' awareness and draw their attention to the entrepreneurial path as a career option (Donckels, 1991), the conflicting results presented previously in the literature review, the discussion of initial levels as control variables, and the importance of including control groups, I proposed the following two hypotheses:

*Hypothesis 1: At the end of the course (t2/post), students in the experimental group are expected to develop higher creative role identities, creative self-efficacies, attitudes, desires, and intentions in comparison to the beginning of the course (t1/pre).*

*Hypothesis 2A: At the end of the course (t2/post), students in the experimental group are expected to develop higher creative role identities, creative self-efficacies, attitudes, desires, and intentions in comparison to students in the control group, controlling for the initial levels of these constructs in both groups (experimental and control).*

Do Paço, Ferreira, Raposo, Rodrigues, & Dinis (2011) together with several scholars in the field (e.g., Kourilsky and Walstad ,1998) emphasized that formal entrepreneurship education influenced the attitudes of students and affects propensity for entrepreneurship. Additionally, Zhao, Seibert, & Hills (2005) found that perceptions of formal learning among MBA students influenced their entrepreneurial self-efficacy which fully mediated the effect of formal learning on entrepreneurial intentions in their study. Many pedagogical practices, such as enactive mastery experiences, typically

employed in entrepreneurship courses could be related to mechanisms of self-efficacy development (Zhao et al., 2005). Taken together, I expected students' perceptions of formal learning to influence their attitudes, desires, intentions toward entrepreneurship, creative self-efficacies, and creative role identities. I asked students four questions about how much they learnt during their entrepreneurship courses regarding typical areas of entrepreneurship (opportunity recognition, opportunity evaluation, starting a business, and corporate entrepreneurship). Since my study examined creativity related constructs as well, it was worthwhile to examine students' perceptions of creative learning (CL). Creativity learning is crucial in the entrepreneurship classroom to prepare potential entrepreneurs to meet the challenges they will face when launching their own enterprises (Gundry et al., 2014).

*Hypothesis 2B: At the end of the course (t2/post), perceptions of formal learning (FL) and creative learning (CL) are expected to have a positive impact on intentions (EIs) among students in the experimental group.*

Following the recommendations of previous studies to improve the theory of planned behavior and address its limitations, hypotheses (3-12D) suggest adding/integrating self-views of past creative behaviour, creative role identity, creative self-efficacy, desires, formal learning, and creative learning as new variables to TPB (see figure 4 ). Current cognitive social psychology perceives the development of self-concepts to be dependent on repeated behavior and past behavioral episodes (Markus & Wurf, 1987). People undergo a self-perception process based on their past behavior to understand what kind of persons they are (Bem, 1972). A role identity can develop over time as people go through a process of retrospective sense making (Grube & Piliavin, 2000). Several longitudinal studies demonstrated that past behavior is a highly

significant predictor of role identity. Farmer et al. (2003) found out that employees who reported being creative in the past also had stronger senses of creative role identity. However, they called for future research to examine and determine the degree of between self views of past creative behaviour and CRID. Their call aligns with the call of other scholars, such as Conner, Armitage, and Kingdon (1998) to investigate the extent to which past behavior predicts future behavior as a function of an individual's self-identity. Taken together, I proposed that those students who were already engaged in creative activities in the past may show a stronger creative role-identity than those who had no prior creative experience:

*Hypothesis 3: Self-views of past creative behaviour (SVPCB) are positively related to creative role identity (CRID).*

Sparks and Shepherd (1992) found that self-identity played an important role, within the context of TPB, in predicting behavioral intentions of consumption. Similar results were achieved by Sparks, Shepherd, Wieringa, and Zimmermanns (1995) who reported that self-identity had an independent predictive impact on intentions in relation to five dietary changes associated with reducing the amount of fat in the diet. In contrast, Theodorakis, Bagiatis, and Goudas (1995) indicated that role identity (synonymous with self-) identity mediated the effects of subjective norms on intentions in the context of teaching individuals with disabilities. These results indicate that role identity affects the development of intentions (Charng et al., 1988). Since entrepreneurship is a far more challenging behavior in contrast to behaviors examined in these studies (Shane & Venkataraman, 2000), there is a need for further research to explore and integrate the concrete role of identity into established explanation models and theories of entrepreneurial intentions and behavior, such as TPB (Obschonka et al., 2015). It is still

unclear whether self-identity can act as an additional construct, in the TPB framework, to predict entrepreneurial behaviors. The argument for including self-identity as an additional predictor in the TPB stems from theorists who have argued that identity processes should be taken into consideration in the prediction of specific behaviors and from empirical evidence that self-identity predicts behavioral intentions after attitudes and norms have been taken into account (Sparks & Shepherd, 1992). Some studies took attempts to estimate the relevance of an entrepreneurial self-identity within the context of TPB and they reached basic promising findings (e.g. Obschonka et al., 2015). Obschonka et al. (2015) found that self-identity was the strongest predictor of entrepreneurial intentions, but showed no significant effect on the intention to develop a business idea. Since their study was among the first studies integrating self-identity concepts as predictors of entrepreneurial intentions, they called for future studies to embed identity-related constructs into established explanation models of entrepreneurship. CRID has not been studied as an antecedent of entrepreneurial intentions within the context of TPB and EE. Combining the previous research on self-identity and the TPB (Rise et al., 2010), I expected the following:

*Hypothesis 4: Creative role identity (CRID) is positively related to entrepreneurial intentions (EIs/INT).*

Both identity and efficacy are complex self-perceptions and beliefs that operate in concert with goal systems within the social cognitive theory of self-regulation (Bandura & Locke, 2003). Burke and Reitzes (1981) emphasized that a sense of efficacy was derived from identity, and in turn identity promoted the development of efficacy. Kickul, Wilson, Marlino, and Barbosa (2008) found that shortfalls in self-efficacy could be partly due to variances in socialization in entrepreneurial intentions. A series of

studies presented provided empirical support for positioning identity as an agent for self-efficacy development. Tierney and Farmer (2002) found out that as employees' creative role identities strengthened, so did their creative self-efficacy. Individuals with a strong creative role identity will pay more attention to novel information, and thus enhance their creative self-efficacy. Gushue, Clarke, Pantzer, and Scanlan (2006) indicated that higher levels of engagement in identity were related to greater decision-making self-efficacy. In spite of the considerable evidence that identity can affect self-efficacy, several scholars called for a closer examination of the identity behaviors that might be closely related to self-efficacy, which could lead to greater creativity (Wang, Tsai, & Tsai, 2014). I am unable to identify any research that has examined the path from CRID to CSE within the entrepreneurship education (EE) context and TPB. Taken together, I hypothesized the following:

*Hypothesis 5: Creative role identity (CRID) is positively related to creative self-efficacy (CSE).*

Sekerka and Bagozzi (2007) proposed that self-efficacy together with outcome expectancies, and affect towards the means of goal attainment combine in a self-reinforcing way to induce the desire to act morally. They based their hypothesis on the view that self-efficacy may be related to motivation that can induce levels of persistence in the face of challenges, thus stimulating a desire to act. An examination of Bandura's (1982) work shows that perceptions of efficacy can induce or impede motivation and performance in multiple ways in addition to the effort and perseverance exerted to achieve one's goals (Bandura & Cervone, 1986). Building on what I know from prior research in addition to the promise of the model developed by Sekerka and Bagozzi (2007) to serve as a platform for future research, I proposed the following:

*Hypothesis 6: Creative self-efficacy (CSE) is positively related to entrepreneurial desires.*

The possible influence of attitudes toward the behavior to found one's own business has been explicitly and implicitly discussed in the literature. Attitudes toward entrepreneurship refer to one's beliefs in regard to the outcomes of starting one's own business and the evaluation of those outcomes (Davidsson, 1995). Krueger (1993) argued that attitude in the TPB includes the notion of perceived desirability in the entrepreneurial event model. In contrast, Bagozzi (1992) argued that attitudes were not sufficient determinants of intentions as the link was hypothesized to depend on cognitive and emotional self-regulatory mechanisms. In addition, he proposed that attitudes, subjective norm and self-efficacy were the best predictors of desires. Similarly, Armitage and Conner (2001) suggested that desires will inform intentions which partially lead to self-predictions. Also, Iakovleva and Kolvereid (2009) reported, when integrating parts of the TPB model and the entrepreneurial event model model, that the intention to become self-employed and found one's own business was a function of desirability-feasibility, which in turn was a function of attitude, subjective norms and perceived behavioural control. According to the theory of self-regulation, "desire is hypothesized as being a proximal cause of intentions, whereas attitudes are considered a distal cause whose influence is totally mediated by desire" (Leone, Perugini, & Ercolani, 1999, p.165). This perception is based on the logic that attitudes are evaluative appraisals which do not include the motivational commitment (push) required for intentions to arise (Bagozzi & Kimmel, 1995). In reference to the pioneering work applying this perception, Shapero and Sokol (1982) discussed the possible influence of attitudes toward the behavior on the desire to found one's own business. Perugini and

Conner (2000) argued in their extended model of the goal directed behavior (EMGB) that an increase in an individual's attitudes was expected to have a positive influence on the individual's desire to perform certain behaviors. This is because more favorable attitudes justify more favorable perceptions of desirability (Schlaegel & Koenig, 2014).

On the other hand, if evaluations are strong enough, attitudes will lead to intentions to perform or not to perform the target act. According to the TPB (Ajzen, 2011) attitudes, subjective norm and perceived behavioural control determine intentions. Intentions, in turn, along with perceived behavioural control determine actual behaviour, such as the decision to become an entrepreneur. Although findings of previous empirical research applying TPB to examine predictions regarding the effects of SN, PBC, and attitudes toward entrepreneurship on intentions as a whole did not represent a conclusive and consistent picture (Karimi et al., 2016), results generally confirmed the propositions (Engle et al., 2010). Several scholars in the field, such as Liñán and Chen (2009) and Fini, Grimaldi, Marzocchi, and Sobrero (2012) reported that attitudes had a significant effect on entrepreneurial intentions. Also, Riquelme and Lanqawi (2016) found that attitudes had a direct relationship with entrepreneurial intentions in their model and they found little evidence to suggest that desire completely mediated the impact of beliefs and attitude on intentions. Taken these contradicting results together, I hypothesized the following:

*Hypothesis 7: Attitudes toward entrepreneurship are positively related to desires.*

*Hypothesis 8: Attitudes toward entrepreneurship are positively related to entrepreneurial intentions (EIs/INT).*

Desires represent the motivational impetus leading to intentions to act (Perugini & Bagozzi, 2001). According to Malle and Knobe (2001), the attribution of intention necessitates that one has a desire for an outcome and holds strong beliefs to the impact that specific behaviors will result in particular outcomes. Several scholars criticized TPB (Ajzen, 2002) for not considering desires in mediating the relationship between attitudes, subjective norms, and PBC and intentions. This has led several scholars to call for further investigation of desires in the path from attitudes and intentions' antecedents to intentions. Armitage & Conner (2001) called for further work to test the causal relationship between desires and intentions, speculating that desires would inform intentions. Similarly, Krueger and Day (2010) called to examine whether entrepreneurial intentions may evolve and go through different stages similar to psychological developments. Based on the literature, I integrated the desire construct in my model and hypothesized the following

*Hypothesis 9: Desires are positively related to entrepreneurship intentions (EIs/INT).*

Self-efficacy perceptions appear central to intentions toward entrepreneurship (Scherer et al., 1989). A robust body of entrepreneurship research has proved clear patterns of relationships between entrepreneurial self-efficacy and entrepreneurial intentions (De Noble et al., 1999). For instance, Krueger et al. (2000) indicated that self-efficacy predicted start-up intentions, Markman et al. (2002) perceived self-efficacy as a key determinant of new venture growth and personal success, and Baum (1996) highlighted that self-efficacy was the single best variable predicting entrepreneurial outcomes in comparison to other utilized variables. By the same logic, individuals who are more confident in their abilities to innovate and to be creative could form

entrepreneurial intentions and more positive beliefs about entrepreneurship opportunities than other individuals (Grégoire & Shepherd, 2012). Zampetakis, Gotsi, Andriopoulos, and Moustakas (2011) found that the more students perceived themselves as creative (employing a different measure than CSE), the higher their entrepreneurial intention was. CSE, has been supported by the current body of research with creativity -related outcomes showing a consistent and quite strong relationship between CSE and self-reported creative outcomes (Farmer & Tierney, 2017). Hammond, Neff, Farr, Schwall, & Zhao (2011) reported CSE to be the strongest predictor of creativity related outcomes in comparison to all other creativity predictors. However, there were other reports that showed an adverse performance effects of efficacy views on creative performance (e.g., Yeo & Neal, 2006). Accordingly, Farmer and Tierney (2017) called to explore potential avenues by which CSE can have an impact. CSE has not been studied before in relation to entrepreneurial intentions and EE. Taken together, I hypothesised the following:

*Hypothesis 10: Creative self-efficacy (CSE) is positively related to entrepreneurial intentions (EIs/INT).*

Still, little is known regarding the potential causal link between some educational variables and the impact of the entrepreneurship education programs (EEP) on the antecedents of the intention and/or behaviour (Fayolle & Gailly, 2013). For example, few studies examined the impact of creative learning on the development of entrepreneurial intention and its antecedents among students. Gundry et al. (2014) found that creativity skills acquired by students positively affected their self-perceptions of creativity, that they transferred their creativity skills to their work, which were positively reflected on their ability to fully participate in their work teams and generate new value for their organizations. Interestingly, Zampetakis, Gotsi, Andriopoulos, and Moustakis

(2011) reported that perceptions of creativity learning supported in the university was found to have no effect on students' entrepreneurial intention. In regard to the other constructs included in my study, other research examining creative self-efficacy (CSE), as an example, reported that students' mastery and performance approach beliefs were positively associated with their CSEs (Beghetto, 2006). As for formal learning derived from entrepreneurship courses, Hancock and Fitzsimons (2005), in their study, reported that in South Africa the formal education system developed entrepreneurial traits. These contradicting results regarding the impact of EE necessitate further research. However, recent reviews suggest that the impact of EE programs on attitudes and behavior is equivocal because studies suggest contradicting outcomes (Nabi et al., 2017). Taken together, I hypothesized at t2/ POST the following. Hypotheses 3-12 are presented in figure 4.

*Hypothesis 11A: FL is positively related to attitudes.*

*Hypothesis 11B: FL is positively related to CRID.*

*Hypothesis 11C: FL is positively related to CSE.*

*Hypothesis 11D: FL is positively related to EIs.*

*Hypothesis 12A: CL is positively related to attitudes.*

*Hypothesis 12B: CL is positively related to CRID.*

*Hypothesis 12C: CL is positively related to CSE.*

*Hypothesis 12D: CL is positively related to EIs.*

**Figure 4: The Hypothetical Model**

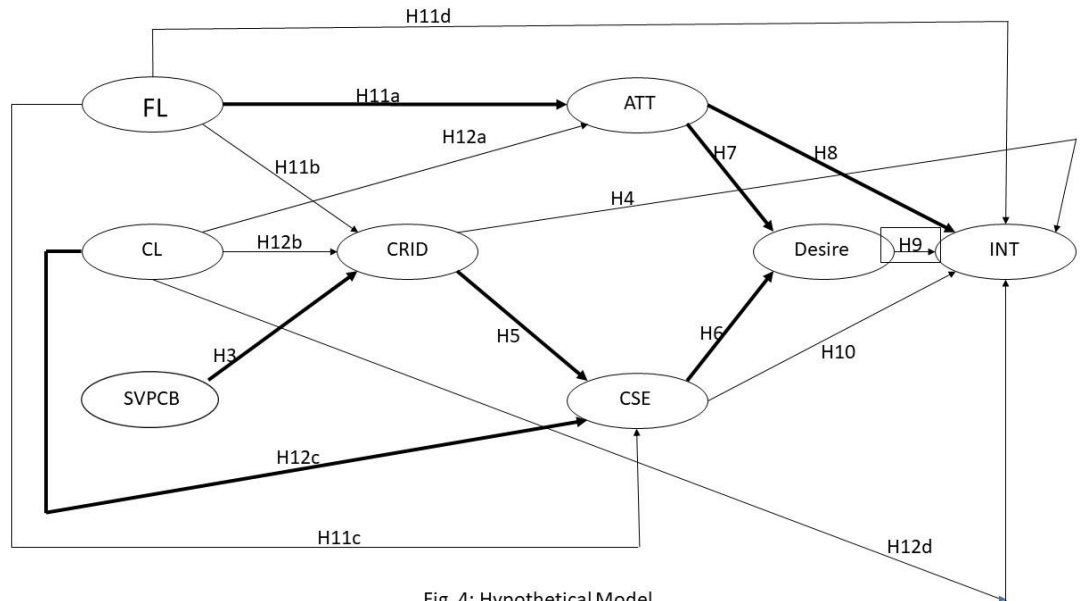


Fig. 4: Hypothetical Model

Employing the 2x2 model in my study hypothesized that creative self-efficacy (CSE) and attitudes toward entrepreneurship need not both be high to induce desires and entrepreneurial intentions, since nascent entrepreneurs with a high/low combination are also likely to form entrepreneurial intentions. However, it should not be ignored their interaction, that is, how the attitude can affect the strength of a dependent variable (EIs) when interacting with another variable, CSE in my study. Most studies, except for a very few, only focused on main effects, ignoring interaction effects when examining entrepreneurial intentions. Most previous studies implied that entrepreneurial intentions are formed when both perceived feasibility and perceived desirability are high (Fitzsimmons & Douglas, 2011). By testing a new TPB model, I argue that antecedents of entrepreneurial intentions, attitudes and CSE in my model, need not both be high to induce entrepreneurial intentions, since nascent entrepreneurs with a high/low combination of attitudes and CSEs are also likely to form entrepreneurial intentions.

This perception responds to research calling for a more complex relationship among the variables preceding entrepreneurial intentions (Krueger & Kickul, 2006).

There are many reasons to suggest that antecedents of entrepreneurial intentions may interact in the formation of an individual's intention to become an entrepreneur. Studies in different contexts evidenced an interaction between perceptions of desirability and feasibility in the formation of behavioral intentions (Conner & McMillan, 1999). For instance, Grube and Morgan (1990) found that an interactive effect between attitude and perceived social support led to an increase in the prediction of adolescent smoking, drinking and drug use. Similarly, Conner and McMillan (1999) assumed a multiplicative relationship between expectancy and valence employing Vroom's expectancy theory. The expectancy model states that individuals first estimate the probability that a certain outcome will be achieved and then the value of that outcome when considering a course of action (Vroom, 1964). The similarities between TPB and expectancy frameworks propose that interaction effects might be expected in the context of entrepreneurial intentions (Fitzsimmons & Douglas, 2011). Bandura (2002) as well as other researchers in the organization behavior field proposed an interaction effect between perceptions of desirability and perceptions of feasibility. Taking a similar approach and drawing on regulatory focus theory, Fitzsimmons and Douglas (2011) looked at the interaction effect of perceived desirability and perceived feasibility on entrepreneurial intentions proposing that entrepreneurial intentions are, generally, not only a function of the main effects of perceived feasibility and perceived desirability but also a function of the interaction between these variables. Their results indicated that entrepreneurial intentions were not only high when both perceived desirability and perceived feasibility were high, but were also high when either perceived desirability or perceived feasibility

was high (and the other was low). Armitage and Conner (2001) indicated that nine studies out of nineteen indicated a significant interaction effect between intention and perceived control on behavior. The interaction of CSE and other variables has been examined in previous empirical research. Carmeli and Schaubroeck (2007) found that creativity was highest when both self-expectations for creativity and CSE were high. In a similar approach, Robinson-Morral, Reiter-Palmon, and Kaufman (2013) reported that quality and originality of problem-solving solutions were highest when problem solvers had high creative efficacy and also perceived high requirements for work creativity. Accordingly, I expected creative self-efficacy (CSE) and attitudes toward entrepreneurship may interact in the formation of EIs. Because previous studies indicated that gender, factors linked to prior entrepreneurial exposure or experience (OWN), and having a parent entrepreneur (PAR) can develop the intention to start a business (Rauch & Hulsink, 2015), I controlled for these variables in hypotheses 13. For example, Drennan et al. (2005) emphasized the importance of the family in developing entrepreneurial intentions. Taken together, I hypothesized the following:

*Hypothesis 13 (H13): The interaction between attitudes toward entrepreneurship and CSE, among students in the experimental group and the control group, will result in four distinct profiles: high attitudes x high CSE (high/high condition); high attitudes x low CSE (high/low condition); low attitudes and high CSE (low/high condition); and low attitudes and low CSE (low/low condition).*

Following the same logic in classifying entrepreneurs based on perceived desirability and feasibility in the study conducted by Fitzsimmons & Douglas (2011), the cross classification of attitudes toward entrepreneurship and CSE was proposed to result

in four distinct profiles suggesting a typology of nascent entrepreneurs: the “natural” entrepreneur characterized by high attitudes x high CSE (high/high condition); the ‘accidental’ entrepreneur characterized by high CSE x low attitudes (high/low condition); the ‘inevitable’ entrepreneur characterized by low CSE x high attitudes (low/high condition); and the ‘abstainer’ or non-entrepreneur characterized by low CSE and low attitudes (low/low condition). Other studies, such as the study conducted by Douglas (2013), used perceived desirability as a proxy for attitudes. In a similar fashion, some studies employed perceived feasibility or self-efficacy interchangeably (Fitzsimmons & Douglas, 2011) . The adjective ‘accidental’ conveys the notion that this person does not possess a strong attitude to become an entrepreneur, but recognizes an unserved opportunity, such as discovering a new technology (Fitzsimmons & Douglas, 2011). ‘Accidental’ entrepreneurs align with ‘opportunity-driven’ entrepreneurs in possessing high levels of self-efficacy which enable them to take advantage of market opportunities (Tyszka et al., 2011). On the other hand, the ‘inevitable’ entrepreneur is the opposite case, with low perceived efficacy and high attitudes. The strong attitudes toward entrepreneurship may lead him/her to explore many entrepreneurial opportunities before ultimately forming the entrepreneurial intention (McMullen & Shepherd, 2006). Due to low self-efficacy but high attitudes toward entrepreneurship, this person be attracted to into new ventures that are neither necessarily lucrative nor long-lived (Smilor et al., 1991). Fitzsimmons and Douglas (2011) suggested that both ‘accidental’ and ‘inevitable’ entrepreneurs would have sufficiently high intentions. Finally, abstainers (non-entrepreneurs) are characterized by low attitudes combined with low CSE. They report the lowest level of intentions and almost no plan to become an entrepreneur (Holiienka et al., 2017).

This classification of nascent entrepreneurs supports the perception that there are differences among entrepreneurs themselves and many ways to be one. Gartner (1985) emphasized that there are differences among entrepreneurs in the same way there are differences among entrepreneurs and non-entrepreneurs. He even stated that the diversity among entrepreneurs maybe larger than the differences between entrepreneurs and non-entrepreneurs. Similarly, Brockhaus (1982) and other researchers referred to the use of psychological characteristics, attitudes, background, and experience in differentiating types of entrepreneurs. Cheung (2014) discussed two types of entrepreneurs. ‘Opportunity entrepreneurs’ are those who start a business to exploit unique opportunities and ‘Necessity entrepreneurs’ are those who form businesses out of a necessity for income, that is, to survive poverty and/or unemployment Perceiving differences among nascent entrepreneurs can be useful for future research into the entrepreneurship process (Fitzsimmons & Douglas, 2011). Utilizing the 2016 GUESSS project individual-level data from 25 European countries, Holienka et al. (2017) classified students according to their inclination to entrepreneurship employing dummy variables ranging from 3 doer to 0 abstainers. My approach is different as the classification of different types of entrepreneurs is driven by the cross classification of attitudes and CSE. The different profiles of intentions along the different stages/levels of attitudes and CSE imply that intentions can evolve. In the dynamic process of how intentions evolve, it is expected that intentions process must probably differ over time (Brannback et al., 2007). As per Ajzen (1987), "intentions are assumed to capture the motivational factors that have an impact on behavior" (Ajzen, 1987).

Students reporting high attitudes and high CSE toward entrepreneurship were proposed to be highest in their EIs. While students showing high attitudes and low CSE were proposed to be third highest in their EIs, students who were low in attitudes and high in CSE ranked second highest in EIs. Finally, students reporting low CSE and low attitudes toward entrepreneurship were expected to rank the lowest in their EIs. I am suggesting that EIs might be high for not only those with high perceived attitudes toward entrepreneurship and CSEs, but also for those with high (H)/low (L) combinations of attitudes and CSEs. My contribution lies in showing that this effect comes in addition to the separate effects of attitudes which were shown in earlier studies. The 2x2 model offers many advantages to the study of entrepreneurship and EE. It sheds light on the complex and dynamic relationship between the different states of mind involved in the entrepreneurship process. This dynamic perception aligns with other stream of research calling for examining the evolution process of entrepreneurial intentions (e.g., Bagozzi, Dholakia, & Basuroy, 2003). In their theory of trying (TOT), Bagozzi et al. (2003) captured the process of how intentions evolve. Drawing on evidence from previous research that self-efficacy is a crucial component in a career choice of self-employment (Chen, Greene, & Crick, 1998; Krueger & Dickson, 1994), I proposed that CSE is a stronger driver of desires and EIs in comparison to attitudes toward entrepreneurship in my model [Insert Figure 3 near here]

*Hypothesis 13A: High attitudes and High CSE will result in the highest EIs/INT.*

*Hypothesis 13B: High attitudes and low CSE will result in the third highest EIs.*

*Hypothesis 13C: Low attitudes and high CSE will result in the second highest EIs/INT.*

*Hypothesis 13D: low attitudes and low CSE will result in the lowest EIs/INT.*

**Figure 3: The Proposed 2\*2 Mod**

	Low CSE	High CSE
Low ATT	4 Lowest INT	2 Second highest INT
High ATT	3 Third Highest INT	1 Highest INT

Fig. 3: The Proposed 2\*2 Model

## 2.6 Chapter Summary

This chapter started with a discussion of the different approaches of evaluating and assessing the impact of university level entrepreneurship education (EE). Then, I addressed two entrepreneurship education course related benefits, perceptions of formal learning and perceptions of creative learning. Since my study drew on the theory of planned behaviour, I discussed the theory and its traditional constructs. The rationale for proposing new constructs to the model was explored. Then, the chapter concluded with a discussion of the research hypotheses.

## **CHAPTER 3: METHODS**

The following section is organized as follows. The first subsection provides an overview of the research methods and process of data collection. Followed by this, I discuss participants and detailed procedures. Then, I elaborate on my measures and the different variables that I employed. The last section presents the different statistical tools that I used to analyze my hypotheses.

### **3.1 Research Methods and Data Collection**

My thesis presents the results of a pre-post- test quasi-experimental design aimed at measuring the impact of entrepreneurship education courses (EECs) on selected cognitive dimensions of the entrepreneurial mindset (EM). I took into consideration initial levels of intentions, attitudes, CSEs, CRIDs, and desires in one of my hypotheses. I examined a dynamic model of the path from desires to intentions involving the pre-birth stage of entrepreneurship compared to other studies that regard entrepreneurship as two static ends of an action of a potential entrepreneur (i.e., to have the intention or not to have the intention). I also used gender, predispositions to entrepreneurship experience, and parents' entrepreneurship experience as control variables in one of my hypotheses. In the literature, these variables have been used to define a profile of a 'typical' entrepreneur (Robinson et al., 1991). As for the entrepreneurship courses related benefits, I tested two relatively malleable factors, perceptions of formal learning (FL) and perceptions of creative learning (CL).

I examined seven entrepreneurship education courses (see Appendix E) that did not only aim at increasing students' awareness of entrepreneurship as a career option through formal learning approaches, but also included various training activities that

foster/promote creative learning. To measure the impact of the EEC on the development of creativity related measures, I investigated courses that aimed at influencing students' perceptions toward entrepreneurship as an essential construct in changing the environment where we live. The outlines of the courses included various practical and experiential training modules in critical thinking, creative and design thinking, in some cases, starting new ventures during the educational program. Particularly, six of the courses focused on conceptualizing the dimensions of the innovation process and three courses concentrated specifically on discussing entrepreneurial opportunities arising from mature and emerging technologies.

### *3.1.1 Participants and Procedures*

I adopted a pretest-posttest control group design to measure perceptions of formal learning (FL), perceptions of creative learning (CL), self-views of past creative behaviour (SVPCB) as well as the change of attitudes toward entrepreneurship, creative role identities (CRIDs), creative self-efficacies (CSEs), desires, and intentions (EIs/INTs) over a period of approximately four months (September - December 2018). Pretest posttest designs with a control group offer a good level of internal validity and sampling from three different universities contributes to the external validity of the findings (Souitaris, Zerbinati, & Al-Laham, 2007). The participants were selected based on the convenience sampling technique (Cooper et al., 2003). The allocation of students to the experimental and control groups was not random (due to common practical difficulties of random sampling), hence the design was quasi-experimental (rather than a true experiment). I was able to match the questionnaires (at t1 and at t2) for 115 students from the experimental group in comparison to 66 students from the control group, thus

making the number of repeated cases 181. Non-repeated cases represented students who filled in the survey at either (t1) only or (t2) only or did not include their email contact, this making it extremely difficult to track their responses at (t1).

My research employed a quantitative method, including a self-reported survey/questionnaire that was handed out at the beginning of the academic Fall 2018 semester and at the end of that semester. The questionnaire drew from a variety of established entrepreneurial instruments. I conducted the study at three major universities in Atlantic Canada: University of New Brunswick (UNB), Saint Mary's University (SMU), and University of Prince Edward Island (UPEI). The three institutions have academic units aimed to embed entrepreneurship among students and offer entrepreneurship courses (ECs) with a wide range of activities. The reason I included different universities was to cover a wide range of courses and different class characteristics. The experimental group consisted of students who attended entrepreneurship courses at UNB, SMU, and UPEI. The control group sample was represented by students enrolled in graduate and undergraduate courses at UNB. The courses were training and development, strategic management, corporate finance, introduction to sport and leisure psychology, and advanced financial accounting.

Both time 1 (t1) and time 2 (t2) questionnaires were in English and were reviewed by my supervising committee and UNB Research Ethics Board (REB) to ensure clarity of wording and validity of the constructs. Time 1 (t1) questionnaire included a demographic section which was not included in t2/post questionnaire. The demographic section (see Appendix C) included questions about the participant's prior entrepreneurship experience in owning or managing a business, having a parent entrepreneur, having a friend or a relative entrepreneur, having a previous experience in

attending an entrepreneurship experience, as well as other demographic related questions. Questionnaires were in principle anonymous, but contact data (emails) were asked for if students freely wanted to receive a copy of the results and to match t1 and t2 questionnaires. T1 and t2 questionnaires measured SVPCB, attitudes toward entrepreneurship, CRIDs, CSEs, desires, and EIs/INT. I emailed instructors teaching entrepreneurship courses at the three universities as well as instructors teaching the control courses at UNB to ask for their permission to survey students in their classes. I attached a letter of information about the study (see Appendix A) to my email as well as UNB REB approval form. Unless instructors indicated that they could distribute the surveys to their students, I distributed the questionnaires at t1 and t2 after giving a brief introduction about myself and my research, emphasizing that participation was always voluntary. I distributed the survey for most of the courses with the exception of two courses which the instructor kindly distributed the surveys.

The questionnaires were distributed to the students at their classes' locations. Students surveyed were told that the questionnaires were for my PhD thesis purposes. I was careful to tell participating students the objective of my research and confirmed that their participation will not affect them in any way. Participants in both the experimental and the control group were asked to read the letter of information about the study prior to responding to the survey (see Appendix B). There was an electronic version of the survey at both t1 and t2 as well. I sent the link to instructors so that students who were physically absent on the data collection day could complete the survey from home. However, most of the responses were collected in class. There were seven online responses at t2 for some students who were absent on the day the questionnaire was

distributed. The course instructor kindly provided an online link to the survey so that absent students could complete it.

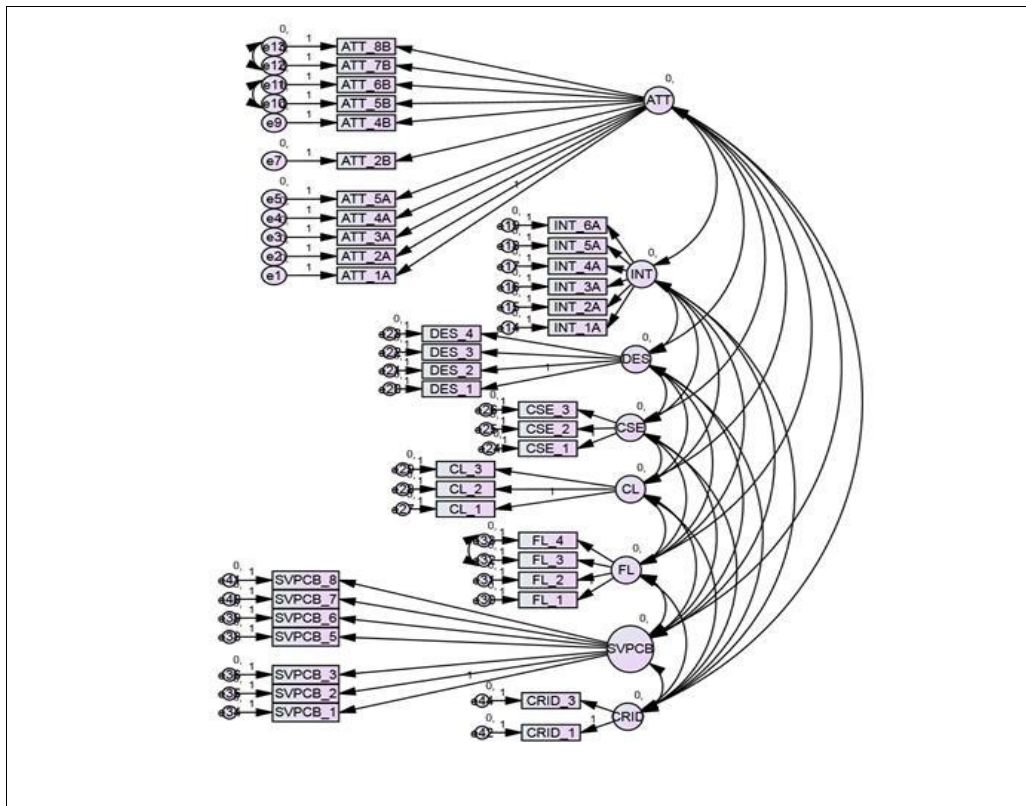
Since self-report surveys can be subject to reliability and validity issues due to common method variance (CMV) possibly leading to measurement errors (Fuller et al., 2016), I employed several statistical and procedural techniques to address CMV and minimize its potential effects. As for the procedural techniques, I followed the recommendations of Podsakoff, MacKenzie, Lee, and Podsakoff (2003) to minimize CMV by avoiding the use of ambiguous/ difficult words and concepts, assuring respondents that their privacy and anonymity were respected, confirming that the whole procedure was voluntarily with no right and wrong answers, and emphasizing the importance of honesty in completing the survey. I also employed Harman's single factor test to see whether there is one general factor which accounts for the majority of the covariance among the measures, thus leading to common method variance, or not (Fuller et al., 2016)

### *3.1.2 Statistical Analysis and Hypotheses Testing*

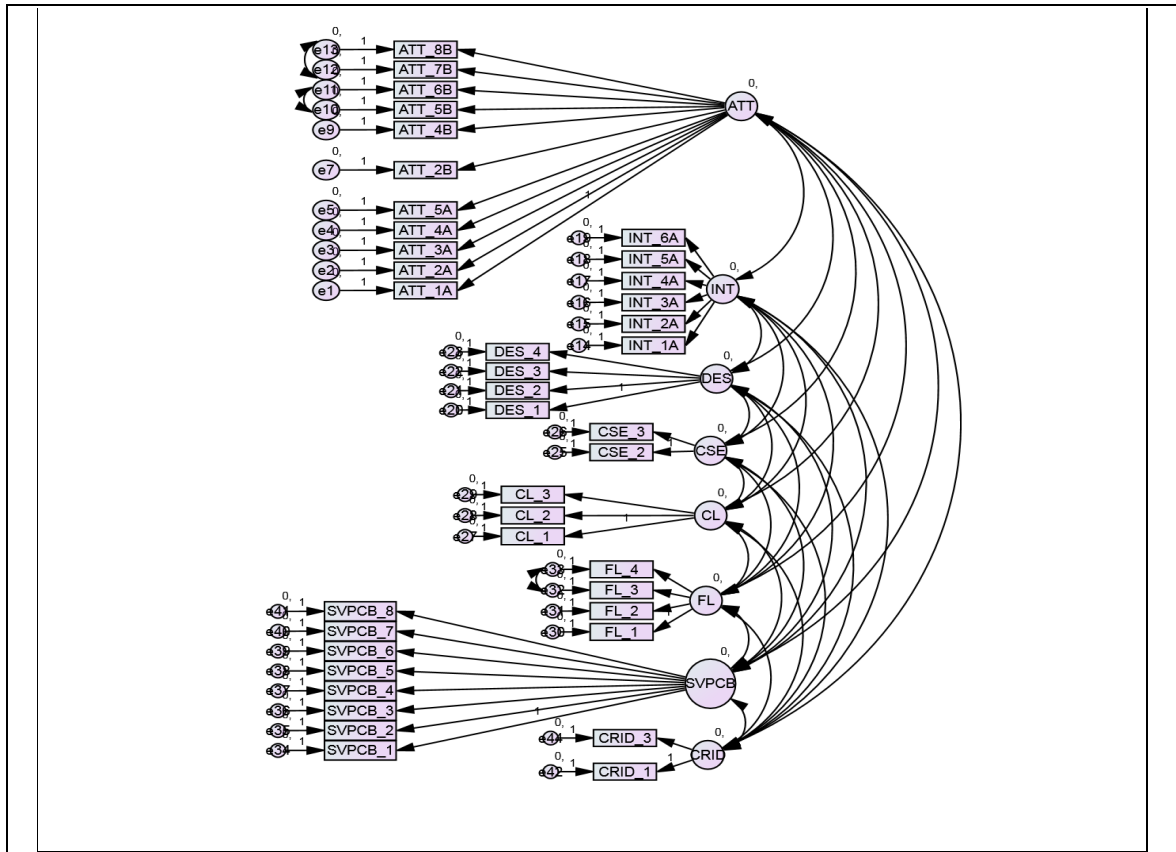
The obtained data were analyzed using SPSS 25, a software package for data analysis (SPSS Inc., Chicago, Illinois, USA) and AMOS 24, a structural equation modeling program that tests the relationships between observed and unobserved variables (IBM, New York, USA). As a first step, a measure of internal consistency/ scale reliability (Cronbach's alpha) was performed on scale items. Then, I performed a confirmatory factor analysis (CFA), a measure of consistency, on the scale items to remove scale items of low factor loadings. Items remaining after this filtering exercise of CFA were subject to further reliability tests (Cronbach alpha) till I arrived at the final

scale items (see figures 5 & 6). This filtering process was repeated at both phases of the study, t1 and t2.

**Figure 5: Pre CFA-Factor Loadings**



**Figure 6: Post CFA Factor Loadings**



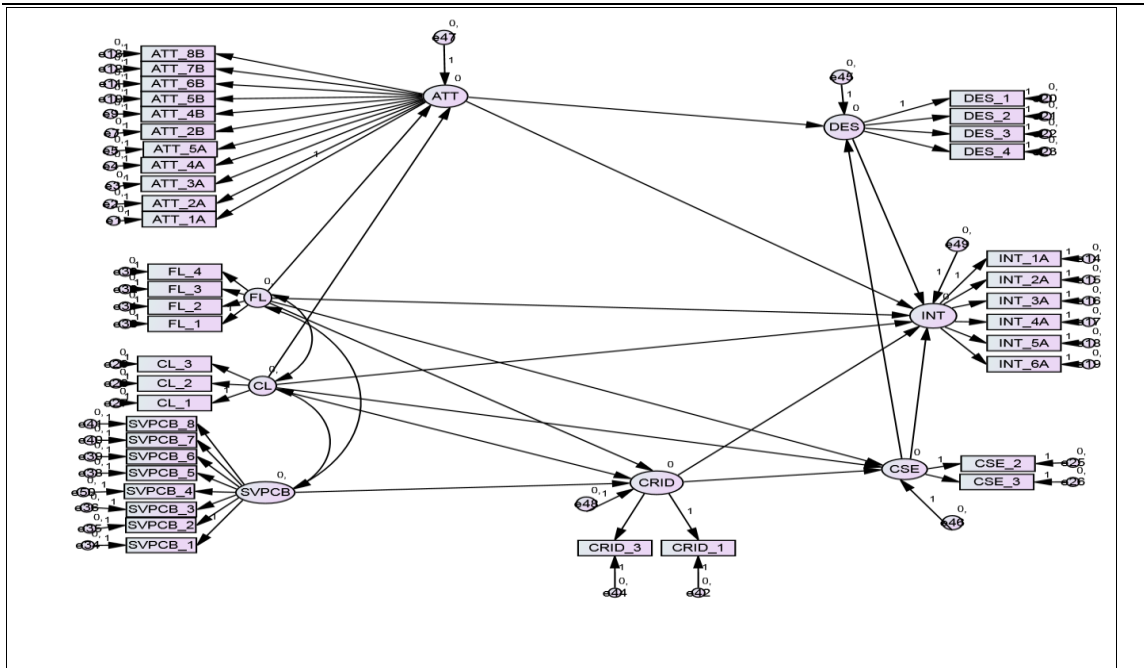
As for hypotheses testing, hypothesis 1 was tested on the experimental group of students who filled in the survey at both t1 and t2 using paired samples *t*-test. The paired samples *t*-test was used to test the impact of the entrepreneurship education courses on the students ‘entrepreneurial attitudes, CSEs, CRIDs, desires, and intentions. A paired sample *t*-test measures the significant difference in the means (Field, 2013) before and after the course. Hypothesis 2A was tested using a univariate analysis of variance, an extension of analysis of covariance (ANCOVA), considering the initial levels of attitudes, CSEs, CRIDs, desires, and intentions as covariates. The sample of students of H2A belonged to the experimental and control groups who completed the questionnaires at both t1 and t2. Univariate analysis has the purpose to describe a single variable

distribution (Field, 2013). H2B was tested on the experimental group of students who completed the questionnaire at t1 and t2 using multiple regression, considering FL and CL as independent variables (IV) and intentions as the dependent variable (DV). I tested whether the variations of intention and its antecedents, FL and CL, could be statistically significant. Multiple regression, an extension of simple linear regression, is used when the value of a variable is predicted based on the value of two or more other variables (Field, 2013).

Having gained confidence that the measurement models was validated, the next step was to define the relationship between intentions and its proposed antecedents. The SEM approach was used to validate the research model and test the effects in the hypotheses (H3-H12D) on the entire repeated experimental group (N=115) at both pretest and posttest. The SEM technique, due to its appropriate prediction power, was chosen for analyzing the data and proposed hypotheses using AMOS 24 Graphics, (Hair et al., 2017). It is a technique that is used to represent, estimate, and test hypotheses about relations between observed and latent constructs (Ferreira et al., 2012). SEM is a priori technique, meaning that the researcher must specify a model in order to conduct the analysis (Kline, 2005). It is used to analyze Stone–Geisser's Q2, goodness-of-fit, coefficient of determination (R2), and path coefficients (Fornell & Larcker, 1981). In SEM, parameters are estimated by minimizing the difference between the observed covariances and those implied by the model. Hair, Black, Babin, Anderson, & Tatham (2006) stated that it is possible to adopt a two-step approach in SEM: (1) the assessment of the measurement model and (2) the assessment of the structural model. Figure 7 represents a SEM diagram that allows for the determination of the set of relationships among all variables. I estimated the structure equation model using the Maximum

likelihood method, which is the most appropriate method to get findings (Enders & Bandalos, 2001).

**Figure 7: Post Model SEM-EXP**



SEM has enjoyed popularity in several research disciplines, such as tourism (e.g. Wu, Raab, Chang, & Krishen, 2016) as well as entrepreneurship (e.g. Hernández-Perlines, Moreno-García, & Yañez-Araque, 2016). However, several studies in entrepreneurship research employed regression methods (e.g., Shirokova, Osiyevskyy, & Bogatyreva, 2016). The advantage of using SEM in comparison to other statistical analyses tools, such as multivariate statistics (regression analysis, probit analysis, ANOVA, MANOVA, discriminate, cluster) is that it explores the whole set of relationships between all types of variables (Guerrero et al., 2008), rather than only exploring the lineal relationship between one dependent variable with many dependent variables (Tabachnick & Fidell, 1996). In my model, the SEM analysis tested all the

relations (direct & indirect & main effects) and directions between FL, CL, SVPCB, CRID, ATT, CSE, DES, and EIs/INT included in the study.

H13 was analyzed using multiple regression on the total experimental (EXP) and control (CTRL) repeated sample at t1 and controlling for gender, having a parent entrepreneur (PAR), and a previous experience in owning or managing a business (OWN). H13A-H13D were tested using multivariate analysis to test the significance and capture the differences in the means between the four profiles resulting from the cross classification. I ran MANOVA with one independent variable (EIs/INT) and one dependent variable (GROUP), with 4 categories or sub-groups (i.e., H(ATT) L(CSE), L(ATT) H(CSE), H(ATT) H(CSE), L(ATT) L(CSE), using median split, as post hoc means comparisons need to be calculated. MANOVA is a multivariate analysis which tests for group differences.

## **3.2 Measures**

### *3.2.1 Control Variables*

Some attempts to control for initial differences among the sample population were made through my use of the time 1 attitude, CRID, CSE, desire, and intention measures in H2A. Several scholars used initial levels of intentions as control variables in their studies. For example, Souitaris et al. (2007) used the t1 values of attitudes and intentions as control variables, assuming that students with higher initial values would have less room for increase. Similarly, Zhao et al. (2005) used initial levels of entrepreneurial intentions as control variables in their study examining the mediating role of entrepreneurial self-efficacy on entrepreneurial intentions. Other studies explicitly employed other demographic information (role models, age, gender, educational level or previous work experience) as control variables. The literature

indicates mixed findings for the impact of background characteristics, such as gender differences on entrepreneurial intentions and attitudes. For example, Kolvereid (1996) studied the influence of gender on attitudes towards new enterprise creation. While some studies found gender differences in entrepreneurial intention (EI; Zhao et al., 2005), others did not report any differences (Gupta et al., 2009). However, many previous studies indicated that men were more likely to develop the intention to found a business than women (Rauch & Hulsink, 2015). As for age, several studies reported that age was related to entrepreneurial intentions and behavior (Morris & Venkatesh, 2000). Gender and age are traditional demographic controls in behavioural research (Kreiner & Ashforth, 2004). In my study, age was measured in years. Gender is trichotomy 1,2, and 3. The value 1 means male (in the “Gender” variable). The value 2 means female. The value 3 means prefer not to answer. Also, other demographics are associated with more favorable perceptions toward entrepreneurship in different studies. For example, prior entrepreneurial experience (Peterman & Kennedy, 2003) and the role of family and role models (Bosma et al., 2012) in opting for a self-employed career were evidenced by prior empirical research. Shapero and Sokol (1982) reported that family, specifically the mother and father, influenced feasibility and desirability of entrepreneurial initiatives. On the other hand, Tkachev and Kolvereid (1999) found that adding background characteristics did not add a significant contribution to the variance in individual’s self-employment intentions. Even if background characteristics influence intention as well as its antecedents, the impact would be a long term one on the initial scores at t1 (Souitaris et al., 2007). In my study, I employed initial values of the primary study variables as controls in my study to test H2A. In addition, I used gender, previous ownership experience (OWN), and parents ‘entrepreneurial experiences (PAR) as control variables

to test H13. Demographics and other related items are presented in Appendix C of this study.

### *3.2.2 Attitudes Toward Entrepreneurship (ATTs)*

Attitudes toward entrepreneurship were adopted from two scales ( $N = 11$ ,  $\alpha = .79$  at t1,  $N = 11$ ,  $\alpha = .83$  at t2). The overall score was obtained by averaging responses after deleting/removing items of low factor loadings. The questionnaire originally consisted of thirteen items. Two items were dropped due to low factor loadings. In regard to the two scales from which attitudes were adopted, the first scale was the entrepreneurial intention questionnaire (EIQ; see Appendix D) developed by Liñán and Chen (2009) where respondents indicated their level of agreement with five sentences ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). A sample item is: “Being an entrepreneur implies more advantages than disadvantages to me”. Liñán and Chen (2009) analyzed the psychometric properties of the EIQ among a sample of Spanish and Taiwanese senior university level students. According to them, the scale was carefully cross checked with other instruments used by other scholars, such as Kickul and Zaper (2000) and Kolvereid (1996). Items in the questionnaire were based on theoretical application of TPB to entrepreneurship and were referenced in previous empirical literature (Linan & Chen, 2009). The EIQ employs an aggregate measure of attitudes, rather than a belief based measure (Liñán & Chen, 2009). Liñán and Chen (2009) suggested that EIQ fulfill reliability and validity requirements. It includes both evaluative and affective considerations. As for validity, both convergent validity and divergent validity were assessed showing satisfactory results.

In addition to the EIQ scale, the Mini Kolvereid Scale (see Appendix D) developed by McNally et al. (2016) was used to measure decisions about future career

plans. According to McNally et al. (2016), the scale incorporates three career choice-related concepts, workload, autonomy, and creativity, derived from the original eleven items developed by (Kolvereid, 1996). The scale is more streamlined and parsimonious which increases the methodological rigor of attitudes/intentions. In their study, the scale was administered among a sample of 880 English-speaking business students from 7 Canadian universities (McNally et al., 2016). It consists of eight items where students responded to statements indicating the extent to which the stated factors were important for their decisions about their future career plans rating from strongly disagree to strongly agree. A sample item includes “Not having long working hours”. McNally et al. (2016) reported that a CFA of the three-factor model revealed a very good model fit ( $\chi^2/df = 5.10$ , NFI = .96; CFI = .97, RMSEA = .07).

### *3.2.3 Creative Self-Efficacy (CSE)*

CSE was measured using a three item scale (see Appendix D) developed by Tierney and Farmer (2002) to which respondents rated their degrees of agreement with three statements on a 5 point Likert scale ranging from strongly disagree to strongly agree (N = 3,  $\alpha = .70$  at t1; N = 2,  $\alpha = .84$  at t2). After the whole analysis was complete, one item was dropped from the scale at t2 due to low Cronbach alpha. A sample item is: “I feel that I am good at generating new ideas”. The scale is used to survey university level students by several researchers across a variety of fields. For example, Robbins and Kegley (2010) employed the CSE scale to collect data from 51 students participating in the study through a Principles of Management course. Tierney and Farmer (2002) provided evidence for the validity of creative self-efficacy as a distinct construct. The overall score was obtained by averaging responses to the three items at t1 and averaging the responses to the two items at t2.

### *3.2.4 Creative Role Identity (CRID)*

Creative Role Identity (CRID) was measured employing a three item scale (see Appendix D) used by Farmer et al. (2003) and Tierney and Farmer (2002). Students were asked to indicate their level of agreement with three sentences ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). The scale's constructs ( $N = 2$ ) attained Cronbach's alphas of 0.65 at t1 versus Cronbach alpha of .63 at t2. The original number of items is 3 ( $N = 3$ ). One item (CRID\_2) was dropped due to low Cronbach alpha. A sample item includes "I often think about being creative". I modified the items' wording to reflect centrality of role identity as a creative entrepreneur. The scale was originally adapted from Callero (1985) role identity scale and is well validated in the literature. The overall score was obtained by averaging responses to the two items after deleting one item from the scale at both t1 and t2.

### *3.2.5 Self-Views of Past Creative Behavior (SVPCB)*

Self-views of past creative behavior (SVPCB) was measured employing an eight item scale, used by Farmer et al. (2003). One item was dropped due to low factor loadings. Appendix D presents the eight SVPCB items. Students were asked to indicate their level of agreement with certain sentences ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). A sample item includes "Always thinks of other ways to solve problems when you run into obstacles". The eight items were extracted from the sufficiency of originality subscale of the Kirton Adaption-Innovation Inventory (KAI; Kirton, 1976). The scale was used in previous creativity studies (e.g., Amabile, Hill, Hennessey, & Tighe, 1994). The scale's items ( $N = 7$ ) attained Cronbach's alphas of .78 at t1. One item was removed at t1 due to low factor loadings. At t2, the scale's

constructs (N = 8) attained a Cronbach alpha of .82. Overall score was obtained by averaging responses to the seven items at t1 and eight items at t2.

### *3.2.6 Entrepreneurial Intentions (EIs/INT):*

Entrepreneurial implementation Intentions were adopted from the EIQ scale (see Appendix D) developed by Liñán and Chen (2009) where students reported their level of agreement to six general sentences indicating different aspects of intentions ranging from 1 (Strongly Disagree) to 5 (Strongly Agree). Sample items include “I am ready to do anything to be an entrepreneur”. The scale is a pure intention measure, different from other scales that mix intentions and self-prediction (e.g., Chen, Greene, & Crick, 1998). Liñán and Chen, (2009) stated that the EIQ fulfilled reliability and validity requirements. The scale’s items (N = 6) attained Cronbach's alphas of .97 at t1 and t2. The overall score was obtained by averaging responses to the six items.

### *3.2.7 Entrepreneurial Desires (DES)*

Desires were adapted from the four item scale (see Appendix D) developed by Bagozzi et al. (2003) where students responded to statements indicating the overall strength of their desire to found their own businesses (N = 4,  $\alpha = .94$  at t1; N = 4,  $\alpha = .94$  at t2). I used a five-point scale. A sample item includes “My desire to start my own company can be expressed”. The items’ wording was slightly modified to specify the action of initiating one’s own business and be consistent with the objectives of the research. Overall score was obtained by averaging responses to the four items.

### *3.2.8 Formal Learning (FL)*

Formal learning was adopted from the four item scale (see Appendix D) developed by (Zhao et al., 2005) where students responded to statements regarding

typical areas of entrepreneurship (opportunity recognition, opportunity evaluation, starting a business, and corporate entrepreneurship). I used a five-point scale ranging from 1 (*very little*) to 5 (*a great deal*) (N = 4,  $\alpha = .93$  at t1; N = 4,  $\alpha = 0.86$  at t2). The overall score was obtained by averaging responses to the four items.

### *3.2.9 Creative Learning (CL)*

Creative Learning was adapted from the three item scale (see Appendix D ) originally developed by (Amabile, 1996) where students responded to statements regarding creativity learning supported in the course (N = 3,  $\alpha = .88$  at t1; N = 3,  $\alpha = .88$  at t2). A sample item includes “In this specific course, I learn that there is more than one solution to a problem”. The items’ wording was slightly adapted to be consistent with the objectives and the group of samples considered in this research.

## **3.3 Chapter Summary**

This chapter started with an overview of research methods and data collection. The section was followed with a discussion of participants and procedures. Then, I discussed the statistical tools employed to analyze the research hypotheses. The chapter concluded with an overview of the different variables and their measures

## CHAPTER 4: RESULTS

### 4.1 Sample, Descriptive Statistics, and Model Fit

#### 4.1.1. *Sample*

While 375 students completed the survey at t1 at the beginning of the academic Fall 2018 semester, 295 students completed the survey at t2 at the end of the academic semester. Of the three universities that participated, 307 students constituted the control group all from the University of New Brunswick, and 94 UNB students were from the experimental group. The other experimental group students came from Saint Mary's University (SMU) n=87 students and the University of Prince Edward Island (UPEI) n=181 students. The total number of cases in the experimental group at both t1 and t2 was 363 (205 cases at PRE-or t1 and 158 cases at POST or t2) in comparison to 307 cases from the control group (170 cases at PRE-or t1 and 137 cases at POST or t2).

The total sample group of students ranged in ages from 17 to 51 years ( $M = 23$  years,  $SD = 5.86$ ) with more males represented (231 males versus 138 females at t1/pre- and 110 males versus 71 females at t2/post). As for educational attainment of the sample for both t1 and t2, 526 cases were undergraduate and 139 cases were postgraduate (Master's level) degree students, respectively.

#### 4.1.2 *Descriptive Statistics of the Entire Repeated Sample*

The descriptive statistics define the principal characteristics of my sample. This sub-section specifically presents the descriptive statistics of the entire repeated sample of students ( $N=181$ ) which consist of students belonging to the experimental and control who completed the surveys at both t1 and t2. Descriptive statistics for the means of the study variables self-views of past creative behaviour (SVPCB), Attitudes (ATT),

creative self-efficacy (CSE), creative role identity (CRID), desire (DES), entrepreneurial intentions (EI/INT), formal learning (FL), and creative learning (CL) of the whole repeated sample of students (N=181; experimental and control) appear below in table 1 (t1/PRE) and table 2 (t2/POST). The correlations of the primary variables SVPCB, ATT, CSE, CRID, DES, EI/INT measured in this study for the repeated samples (who filled in the questionnaires at both t1 and t2) from both the experimental and the control group appear below in table 3 (PRE/T1) and table 4 (POST/T2). Simple correlations (Table 3/PRE) show that attitudes and desires show strong correlations to EI. While FL, SVPCB and CRID show moderate correlations to EI, CL and CSE show quite weak correlations. Comparing simple correlations at the pretest phase with correlations at the posttest stage, I find that the same degrees of strengths of correlations to EI/INT continue to persist. Table 3 also shows a strong correlation between the study variables at t1 except for CL and CSE. However, table 4 shows a strong correlation between CL and CSE as well as the other the study variables at t2.

**Table 1: Descriptive Statistics PRE/T1 (Repeated Sample) (n=181)**

	<b>Mean</b>	<b>Std. Deviation</b>
ATT	3.80	0.62
INT	3.21	1.15
DES	3.45	1.00
CSE	3.90	0.63
CL	3.92	0.68
FL	2.78	1.13
SVPCB	3.47	0.61
CRID	3.42	0.94

\*ATT=attitudes; INT=intentions; DES=desires; CSE=creative self-efficacy; CL=creative learning; FL=formal learning; SVPCB=self-views of past creative behavior; CRID= creative role identity

**Table 2: Descriptive Statistics POST/T2 (Repeated Sample) (n=181)**

	Mean	Std. Deviation
ATT	3.70	0.69
INT	3.14	1.20
DES	3.44	1.10
CSE	4.03	0.70
CL	4.08	0.79
FL	3.43	1.00
SVPCB	3.56	0.63
CRID	3.47	0.95

**Table 3: Correlations among Primary Study Variables PRE/T1 (Repeated Sample)**

		ATT	INT	DES	CSE	CL	FL	SVPCB	CRID
ATT	Pearson Correlation	1	.854**	.792**	.410**	.280**	.421**	.566**	.671**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
	N	181	181	181	181	181	181	181	181
INT	Pearson Correlation	.854**	1	.882**	.334**	.305**	.448**	.507**	.693**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
	N	181	181	181	181	181	181	181	181
DES	Pearson Correlation	.792**	.882**	1	.357**	.275**	.380**	.471**	.658**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000
	N	181	181	181	181	181	181	181	181
CSE	Pearson Correlation	.410**	.334**	.357**	1	.117	.339**	.603**	.452**
	Sig. (2-tailed)	.000	.000	.000		.117	.000	.000	.000
	N	181	181	181	181	181	181	181	181
CL	Pearson Correlation	.280**	.305**	.275**	.117	1	.422**	.374**	.354**
	Sig. (2-tailed)	.000	.000	.000	.117		.000	.000	.000
	N	181	181	181	181	181	181	181	181
FL	Pearson Correlation	.421**	.448**	.380**	.339**	.422**	1	.465**	.485**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000
	N	181	181	181	181	181	181	181	181
SVPCB	Pearson Correlation	.566**	.507**	.471**	.603**	.374**	.465**	1	.605**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000
	N	181	181	181	181	181	181	181	181
CRID	Pearson Correlation	.671**	.693**	.658**	.452**	.354**	.485**	.605**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	181	181	181	181	181	181	181	181

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

**Table 4: Correlations among Primary Study Variables POST/T2 (Repeated Sample)**

		ATT	INT	DES	CSE	CL	FL	SVPCB	CRID
ATT	Pearson Correlation	1	.801**	.743**	.315**	.344**	.456**	.494**	.680**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
	N	181	181	181	181	181	181	181	181
INT	Pearson Correlation	.801**	1	.883**	.325**	.356**	.571**	.555**	.673**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
	N	181	181	181	181	181	181	181	181
DES	Pearson Correlation	.743**	.883**	1	.325**	.394**	.578**	.565**	.645**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000
	N	181	181	181	181	181	181	181	181
CSE	Pearson Correlation	.315**	.325**	.325**	1	.301**	.378**	.557**	.430**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000
	N	181	181	181	181	181	181	181	181
CL	Pearson Correlation	.344**	.356**	.394**	.301**	1	.608**	.500**	.372**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
	N	181	181	181	181	181	181	181	181
FL	Pearson Correlation	.456**	.571**	.578**	.378**	.608**	1	.563**	.493**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000
	N	181	181	181	181	181	181	181	181
SVPCB	Pearson Correlation	.494**	.555**	.565**	.557**	.500**	.563**	1	.577**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000
	N	181	181	181	181	181	181	181	181
CRID	Pearson Correlation	.680**	.673**	.645**	.430**	.372**	.493**	.577**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	181	181	181	181	181	181	181	181

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

#### 4.1.3 Descriptive Statistics of the Repeated Sample by Group

Descriptive statistics for the means of the study variables (FI, CL, SVPCB, Attitudes, CSE, CRID, DES, EI) of the repeated sample of students by group experimental (EXP; N=115) and Control (CTRL; N=66) appear in Table 5 (PRE/T1) and table 6 (POST/T2). Correlations between the study variables of the repeated sample by group (EXP and Control) appear in tables 7 and 8. Table 9 shows that while 32.2%

of the students belonging to the repeated experimental group attended an entrepreneurship course before, 67.8% did not attend entrepreneurship courses before. The table also shows that while 21.2% of the control repeated group attended an entrepreneurship course before, 78.8% of those students did not attend. Table 10 shows that 24.2% of students belonging to the experimental repeated group have an experience owning/managing their own business and 75.7% do not have any experience owning/managing their own business. It also shows that 16.7% of students belonging to the control repeated group have experience owning/managing their own business and 83.3% do not have any experience owning/managing their own business. Table 11 shows that while 47.8% of students belonging to the experimental repeated group have parents who have started a company/business, 40.9% of students belonging to the control repeated group have parents who have started a company/business. Tables 12 and 13 show the gender and friends/relatives owning a business demographics of the repeated experimental and control group.

**Table 5: Descriptive Statistics by Group PRE/T1 (Repeated Sample)**

GROUP		Mean	Std. Deviation	N
EXP	ATT	4.02	0.52	115
	INT	3.66	0.98	115
	DES	3.82	0.86	115
	CSE	4.03	0.60	115
	CL	3.99	0.68	115
	FL	3.04	1.15	115
	SVPCB	3.59	0.61	115
	CRID	3.72	0.83	115
CONTROL	ATT	3.42	0.60	66
	INT	2.44	1.01	66
	DES	2.81	0.91	66
	CSE	3.67	0.61	66
	CL	3.79	0.67	66
	FL	2.33	0.93	66
	SVPCB	3.27	0.56	66
	CRID	2.89	0.90	66

**Table 6: Descriptive Statistics by Group POST/T2 (Repeated Sample)**

GROUP		Mean	Std. Deviation	N
EXP	ATT	3.90	0.66	115
	INT	3.59	1.11	115
	DES	3.87	0.95	115
	CSE	4.13	0.65	115
	CL	4.23	0.78	115
	FL	3.83	0.87	115
	SVPCB	3.74	0.60	115
	CRID	3.76	0.90	115
CONTROL	ATT	3.36	0.59	66
	INT	2.34	0.91	66
	DES	2.68	0.93	66
	CSE	3.85	0.75	66
	CL	3.82	0.74	66
	FL	2.73	0.81	66
	SVPCB	3.25	0.56	66
	CRID	2.97	0.83	66

**Table 7: Correlations among Primary Study Variables by group PRE/T1 (Repeated Sample)**

**Correlations**

<b>GROUP</b>			<b>ATT</b>	<b>INT</b>	<b>DES</b>	<b>CSE</b>	<b>CL</b>	<b>FL</b>	<b>SVPC B</b>	<b>CRID</b>
EXP	ATT	Pearson Correlation	1	.829**	.744**	.395**	.396**	.284**	.608**	.552**
		Sig. (2-tailed)		.000	.000	.000	.000	.002	.000	.000
		N	115	115	115	115	115	115	115	115
	INT	Pearson Correlation	.829**	1	.845**	.312**	.447**	.320**	.561**	.595**
		Sig. (2-tailed)	.000		.000	.001	.000	.000	.000	.000
		N	115	115	115	115	115	115	115	115
	DES	Pearson Correlation	.744**	.845**	1	.329**	.346**	.218*	.517**	.529**
		Sig. (2-tailed)	.000	.000		.000	.000	.019	.000	.000
		N	115	115	115	115	115	115	115	115
	CSE	Pearson Correlation	.395**	.312**	.329**	1	.108	.264**	.567**	.390**
		Sig. (2-tailed)	.000	.001	.000		.253	.004	.000	.000
		N	115	115	115	115	115	115	115	115
	CL	Pearson Correlation	.396**	.447**	.346**	.108	1	.480**	.441**	.465**
		Sig. (2-tailed)	.000	.000	.000	.253		.000	.000	.000
		N	115	115	115	115	115	115	115	115
	FL	Pearson Correlation	.284**	.320**	.218*	.264**	.480**	1	.409**	.365**
		Sig. (2-tailed)	.002	.000	.019	.004	.000		.000	.000
		N	115	115	115	115	115	115	115	115
	SVP CB	Pearson Correlation	.608**	.561**	.517**	.567**	.441**	.409**	1	.620**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000
		N	115	115	115	115	115	115	115	115
CRID	Pearson Correlation	.552**	.595**	.529**	.390**	.465**	.365**	.620**	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		
	N	115	115	115	115	115	115	115	115	
CONTR OL	ATT	Pearson Correlation	1	.785**	.714**	.227	.018	.435**	.390**	.644**
		Sig. (2-tailed)		.000	.000	.066	.887	.000	.001	.000
		N	66	66	66	66	66	66	66	66
	INT	Pearson Correlation	.785**	1	.843**	.092	-.020-	.444**	.257*	.637**
		Sig. (2-tailed)	.000		.000	.464	.873	.000	.037	.000
		N	66	66	66	66	66	66	66	66
	DES	Pearson Correlation	.714**	.843**	1	.151	.062	.413**	.221	.636**
		Sig. (2-tailed)								
		N	66	66	66	66	66	66	66	66

	Sig. (2-tailed)	.000	.000		.227	.620	.001	.074	.000
	N	66	66	66	66	66	66	66	66
CSE	Pearson Correlation	.227	.092	.151	1	.037	.308*	.586**	.368**
	Sig. (2-tailed)	.066	.464	.227		.766	.012	.000	.002
	N	66	66	66	66	66	66	66	66
CL	Pearson Correlation	.018	-.020-	.062	.037	1	.242	.187	.111
	Sig. (2-tailed)	.887	.873	.620	.766		.051	.133	.374
	N	66	66	66	66	66	66	66	66
FL	Pearson Correlation	.435**	.444**	.413**	.308*	.242	1	.452**	.522**
	Sig. (2-tailed)	.000	.000	.001	.012	.051		.000	.000
	N	66	66	66	66	66	66	66	66
SVP CB	Pearson Correlation	.390**	.257*	.221	.586**	.187	.452**	1	.481**
	Sig. (2-tailed)	.001	.037	.074	.000	.133	.000		.000
	N	66	66	66	66	66	66	66	66
CRID	Pearson Correlation	.644**	.637**	.636**	.368**	.111	.522**	.481**	1
	Sig. (2-tailed)	.000	.000	.000	.002	.374	.000	.000	
	N	66	66	66	66	66	66	66	66

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

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

**Table 8: Correlations among Primary Study Variables by group POST/T2 (Repeated Sample)**

			Correlations							
GROUP			ATT	INT	DES	CSE	CL	FL	SVPC B	CRID
EXP	ATT	Pearson Correlation	1	.757**	.642**	.363**	.312**	.310**	.425**	.619**
		Sig. (2-tailed)		.000	.000	.000	.001	.001	.000	.000
		N	115	115	115	115	115	115	115	115
	INT	Pearson Correlation	.757**	1	.846**	.341**	.329**	.422**	.525**	.583**
		Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
		N	115	115	115	115	115	115	115	115
	DES	Pearson Correlation	.642**	.846**	1	.348**	.357**	.432**	.537**	.514**
		Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000
		N	115	115	115	115	115	115	115	115
	CSE	Pearson Correlation	.363**	.341**	.348**	1	.419**	.472**	.541**	.452**
		Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000
		N	115	115	115	115	115	115	115	115
	CL	Pearson Correlation	.312**	.329**	.357**	.419**	1	.621**	.558**	.368**
		Sig. (2-tailed)	.001	.000	.000	.000		.000	.000	.000
		N	115	115	115	115	115	115	115	115
	FL	Pearson Correlation	.310**	.422**	.432**	.472**	.621**	1	.579**	.400**
		Sig. (2-tailed)	.001	.000	.000	.000	.000		.000	.000
		N	115	115	115	115	115	115	115	115
	SVP CB	Pearson Correlation	.425**	.525**	.537**	.541**	.558**	.579**	1	.554**
		Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000
		N	115	115	115	115	115	115	115	115
CRID	Pearson Correlation	.619**	.583**	.514**	.452**	.368**	.400**	.554**	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000		
	N	115	115	115	115	115	115	115	115	
CONTR OL	ATT	Pearson Correlation	1	.776**	.785**	.106	.208	.348**	.380**	.631**
		Sig. (2-tailed)		.000	.000	.396	.094	.004	.002	.000
		N	66	66	66	66	66	66	66	66
	INT	Pearson Correlation	.776**	1	.842**	.144	.158	.400**	.307*	.628**
		Sig. (2-tailed)	.000		.000	.250	.204	.001	.012	.000
		N	66	66	66	66	66	66	66	66
	DES	Pearson Correlation	.785**	.842**	1	.143	.252*	.384**	.336**	.642**
		Sig. (2-tailed)	.000	.000		.251	.042	.001	.006	.000

	N	66	66	66	66	66	66	66	66
CSE	Pearson Correlation	.106	.144	.143	1	.025	.105	.527**	.299*
	Sig. (2-tailed)	.396	.250	.251		.843	.402	.000	.015
	N	66	66	66	66	66	66	66	66
CL	Pearson Correlation	.208	.158	.252*	.025	1	.500**	.245*	.187
	Sig. (2-tailed)	.094	.204	.042	.843		.000	.048	.133
	N	66	66	66	66	66	66	66	66
FL	Pearson Correlation	.348**	.400**	.384**	.105	.500**	1	.231	.280*
	Sig. (2-tailed)	.004	.001	.001	.402	.000		.062	.023
	N	66	66	66	66	66	66	66	66
SVP CB	Pearson Correlation	.380**	.307*	.336**	.527**	.245*	.231	1	.400**
	Sig. (2-tailed)	.002	.012	.006	.000	.048	.062		.001
	N	66	66	66	66	66	66	66	66
CRID	Pearson Correlation	.631**	.628**	.642**	.299*	.187	.280*	.400**	1
	Sig. (2-tailed)	.000	.000	.000	.015	.133	.023	.001	
	N	66	66	66	66	66	66	66	66

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

**Table 9: Descriptive Statistics by GROUP \* PRIOR (Repeated Sample)**

		PRIOR		
		1	2	Total
GROUP	EXP	32.2%	67.8%	100.0%
	CONTROL	21.2%	78.8%	100.0%
Total		28.2%	71.8%	100.0%

**Table 10: Descriptive Statistics by Group \* OWN (Repeated Sample)**

		OWN		
		1	2	Total
GROUP	EXP	24.3%	75.7%	100.0%
	CONTROL	16.7%	83.3%	100.0%
Total		21.5%	78.5%	100.0%

**Table 11: Descriptive Statistics by GROUP \* PAR (Repeated Sample)**

		PAR		
		1	2	Total
GROUP	EXP	47.8%	52.2%	100.0%
	CONTROL	40.9%	59.1%	100.0%
Total		45.3%	54.7%	100.0%

**Table 12: Descriptive Statistics by GROUP \* ANY (Repeated Sample)**

		ANY		
		1	2	Total
GROUP	EXP	91.3%	8.7%	100.0%
	CONTROL	74.2%	25.8%	100.0%
Total		85.1%	14.9%	100.0%

**Table 13: Descriptive Statistics by GROUP \* GENDER (Repeated Sample)**

		GENDER		
		1	2	Total
GROUP	EXP	67.0%	33.0%	100.0%
	CONTROL	48.5%	51.5%	100.0%
Total		60.2%	39.8%	100.0%

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

\*EXP=experimental; ATT=attitudes; INT=intentions; DES=desires; CSE=creative self-efficacy; CL=creative learning; FL=formal learning; SVPCB=self-views of past creative behavior; CRID= creative role identity

#### 4.1.4 Descriptive Statistics of the Whole Sample

Descriptive statistics of the whole sample (N=670) participating in the study: age, gender, CTRL/EXP, PRE/POST, the attended university (university), a previous experience in attending an entrepreneurship course (prior), a previous experience in owning or managing a business (own), having a parent entrepreneur (PAR), and having a friend or a relative entrepreneur (any) appear in tables 14-22.

**Table 14-Age (Whole Sample)**

	<b>N</b>	<b>Minimum</b>	<b>Maximum</b>	<b>Mean</b>	<b>Std. Deviation</b>
2.AGE	585	17.00	51.00	23.3897	5.84988
Valid N (listwise)	585				

<b>Age group</b>	<b>N</b>	<b>(%)</b>
Less than 20	101	15%
20 -	491	73%
30 -	57	9%
More than 40	21	3%
<b>Total</b>	<b>670</b>	<b>100%</b>

**Table 15 -GENDER \*PRE/POST (Whole Sample)**

<b>Gender</b>	<b>PRE / POST</b>		<b>Total</b>
	<b>PRE</b>	<b>POST</b>	
Male	231	110	341
Female	138	71	209
Prefer Not to Answer	2	1	3
<i>Missing</i>	4	113	117
<b>Total</b>	<b>375</b>	<b>295</b>	<b>670</b>

**Table 16-CRL/EXP \* PRE/POST (Whole Sample)**

		<b>PRE/POST</b>		<b>Total</b>
		<b>PRE</b>	<b>POST</b>	
CRL/EXP	CRL	170	137	307
	EXP	205	158	363
<b>Total</b>		<b>375</b>	<b>295</b>	<b>670</b>

**Table 17- UNI \* CRL/EXP (Whole Sample)**

		CRL/EXP		Total
		CRL	EXP	
4. UNI		0	1	1
	SMU	0	87	87
	UNB	307	94	401
	UPE	0	181	181
Total		307	363	670

**Table 18-PRIOR \* PRE/POST (Whole Sample)**

		PRE/POST		Total
		1.00	2.00	
10. PRIOR	yes	113	52	165
	No	260	131	391
Total		373	183	556

**Table 19-OWN \* PRE/POST (Whole Sample)**

		PRE/POST		Total
		1.00	2.00	
11a. OWN	Yes	86	40	126
	No	288	144	432
	3.00	1	0	1
Total		375	184	559

**Table 20-PAR \* PRE/POST (Whole Sample)**

		PRE/POST		Total
		1.00	2.00	
13a.PAR	Yes	163	84	247
	No	208	100	308
Total		371	184	555

**Table 21-ANY \* PRE/POST (Whole Sample)**

		PRE/POST		Total
		1.00	2.00	
14a.ANY	Yes	308	156	464
	No	66	28	94
Total		374	184	558

**Table 22. U/G (Whole Sample)**

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Graduate	139	13.9	20.9	20.9
	Undergraduate	526	52.6	79.1	100.0
	Total	665	66.5	100.0	
Missing	System	335	33.5		
Total		1000	100.0		

#### *4.1.5 The Model's Validity and Reliability*

The validity of my model (depicting the repeated sample of students who filled in the surveys at t1 and t2) was assessed via confirmatory factor analysis (CFA) at both t1 and t2 for SVPCB, ATTs, CRID, CSE, DESs, EIs/INT, FL, and CL (see Table 23 & Table 25). CFA was performed on the items to test how well the measured variables represent the number of constructs and consequently eliminate problematic items (Karimi et al., 2016). Factor loadings were calculated necessitating significant and sizable values greater than .5 (Anderson & Gerbing, 1988). As shown in Table 23 (PRE/T1) and Table 25 (POST/T2), all factor loadings were significant and relatively sizable, suggesting satisfactory construct validity. Items remaining after this filtering exercise were selected to build each of the scales used in the structural equation modeling (SEM). Cronbach's alpha results, indicating the reliability of variables at t1

and t2, appear in tables 24 and 26. Results show high consistency and reliability of my data with a Cronbach's alpha  $\alpha >$  than .50.

**Table 23. Standardized Factor Loadings-PRE/T1**

			Estimate
ATT_1A	<---	ATT	0.56
ATT_2A	<---	ATT	0.91
ATT_3A	<---	ATT	0.84
ATT_4A	<---	ATT	0.85
ATT_5A	<---	ATT	0.88
ATT_2B	<---	ATT	-0.24
ATT_4B	<---	ATT	0.23
ATT_5B	<---	ATT	0.57
ATT_6B	<---	ATT	0.43
ATT_7B	<---	ATT	0.68
ATT_8B	<---	ATT	0.49
INT_1A	<---	INT	0.86
INT_2A	<---	INT	0.92
INT_3A	<---	INT	0.93
INT_4A	<---	INT	0.90
INT_5A	<---	INT	0.89
INT_6A	<---	INT	0.95
DES_1	<---	DES	0.95
DES_2	<---	DES	0.95
DES_3	<---	DES	0.84
DES_4	<---	DES	0.84
CSE_1	<---	CSE	0.75
CSE_2	<---	CSE	0.76
CSE_3	<---	CSE	0.54
CL_1	<---	CL	0.88
CL_2	<---	CL	0.88
CL_3	<---	CL	0.77
FL_1	<---	FL	0.96
FL_2	<---	FL	0.96
FL_3	<---	FL	0.76
FL_4	<---	FL	0.73
SVPCB_1	<---	SVPCB	0.53
SVPCB_2	<---	SVPCB	0.65
SVPCB_3	<---	SVPCB	0.69

			Estimate
SVPCB_5	<---	SVPCB	0.53
SVPCB_6	<---	SVPCB	0.70
SVPCB_7	<---	SVPCB	0.72
SVPCB_8	<---	SVPCB	0.59
CRID_1	<---	CRID	0.58
CRID_3	<---	CRID	0.86

Note: All factor loadings significant,  $p < .01$ .

## Tables 24A-I: Reliability Analyses-PRE/T1

### Cronbach Alpha (PRE)

#### Scale A: INT

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

##### Reliability Statistics

Cronbach's Alpha	N of Items
.97	6

### Reliability

#### Scale B: DES

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

##### Reliability Statistics

Cronbach's Alpha	N of Items
.94	4

### Reliability

#### Scale C: CSE

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.70	3

### Reliability

#### Scale D: CL

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.88	3

### Reliability

#### Scale E: FL

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.93	4

### Reliability

#### Scale F: CRID

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.14	3

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CRID_1	5.88	2.085	.283	-.431 <sup>a</sup>
CRID_2	6.84	3.546	-.206	.651
CRID_3	6.62	1.671	.227	-.432 <sup>a</sup>

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

### Reliability

#### Scale G: CRID

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

##### Reliability Statistics

Cronbach's Alpha	N of Items
.65	2

### Reliability

#### Scale H: ATT

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

##### Reliability Statistics

Cronbach's Alpha	N of Items
.79	13

### Reliability

#### Scale I: SVPCB

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

**Reliability Statistics**

Cronbach's Alpha	N of Items
.78	8

**Table 25. Standardized Factor Loadings-POST/T2**

	Estimate
ATT_1A <--- ATT	0.67
ATT_2A <--- ATT	0.91
ATT_3A <--- ATT	0.88
ATT_4A <--- ATT	0.92
ATT_5A <--- ATT	0.90
ATT_2B <--- ATT	-0.30
ATT_4B <--- ATT	0.25
ATT_5B <--- ATT	0.57
ATT_6B <--- ATT	0.42
ATT_7B <--- ATT	0.66
ATT_8B <--- ATT	0.58
INT_1A <--- INT	0.90
INT_2A <--- INT	0.94
INT_3A <--- INT	0.93
INT_4A <--- INT	0.96
INT_5A <--- INT	0.89
INT_6A <--- INT	0.95
DES_1 <--- DES	0.96
DES_2 <--- DES	0.85
DES_3 <--- DES	0.90
DES_4 <--- DES	0.88
CSE_2 <--- CSE	0.78
CSE_3 <--- CSE	0.94
CL_1 <--- CL	0.84
CL_2 <--- CL	0.85
CL_3 <--- CL	0.85
FL_1 <--- FL	0.94
FL_2 <--- FL	0.86
FL_3 <--- FL	0.61
FL_4 <--- FL	0.66
SVPCB_1 <--- SVPCB	0.57
SVPCB_2 <--- SVPCB	0.71
SVPCB_3 <--- SVPCB	0.75
SVPCB_4 <--- SVPCB	0.16
SVPCB_5 <--- SVPCB	0.59
SVPCB_6 <--- SVPCB	0.68

	Estimate
SVPCB_7 <--- SVPCB	0.78
SVPCB_8 <--- SVPCB	0.62
CRID_1 <--- CRID	0.57
CRID_3 <--- CRID	0.82

Note: All factor loadings significant,  $p < .01$ .

## Tables 26A-I: Reliability Analyses-POST/T2

### Cronbach Alpha (POST)

#### Reliability

#### Scale A: INT

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

##### Reliability Statistics

Cronbach's Alpha	N of Items
.973	6

#### Reliability

#### Scale B: DES

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

##### Reliability Statistics

Cronbach's Alpha	N of Items
.94	4

#### Reliability

#### Scale C: CSE

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.27	3

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CSE_1	8.06	1.975	.176	.843
CSE_2	8.12	10.925	.341	.134
CSE_3	8.16	10.902	.302	.147

### Reliability

#### Scale D: CSE

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.84	2

### Reliability

#### Scale E: CL

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.88	3

### Reliability

#### Scale F: FL

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.86	4

### Reliability

#### Scale G: SVPCB

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.82	8

### Reliability

#### Scale H: CRID

##### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

### Reliability Statistics

Cronbach's Alpha	N of Items
.12	3

### Item-Total Statistics

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Cronbach's Alpha if Item Deleted
CRID_1	6.01	2.194	.292	-.477 <sup>-a</sup>
CRID_2	6.94	3.613	-.191	.628
CRID_3	6.73	1.929	.180	-.288 <sup>-a</sup>

a. The value is negative due to a negative average covariance among items. This violates reliability model assumptions. You may want to check item codings.

## Reliability

### Scale I: CRID

#### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	N of Items
.63	2

## Reliability

### Scale JATT

#### Case Processing Summary

		N	%
Cases	Valid	181	100.0
	Excluded <sup>a</sup>	0	.0
	Total	181	100.0

a. Listwise deletion based on all variables in the procedure.

#### Reliability Statistics

Cronbach's Alpha	N of Items
.83	13

#### 4.1.5 The Model Fit Summary

The model fit indexes for the model at t1 (PRE) and at t2 (POST; after the course) are presented in Tables 27 and 28. My hypothesized models fit the data well. To check the fitness of my measurement model at PRE and POST, I considered comparative fit index (CFI), incremental fit index (IFI), Tucker Lewis index (TLI), Normed Fit index (NFI), Adjusted Goodness of Fit (AGFI), CMIN/DF, and the Root Mean Square Error (RMSEA). Since CFI, IFI, TLI, and NFI compare the fit of a model to a baseline (Bentler, 1990), they are chosen. According to Bentler (1990), a good fit is

indicated by values closer to 1.00. CMIN/DF should be less than 5. The comparative fit index (CFI) is one of the most commonly reported fit indices which uses a baseline model for comparison purposes, meaning that the fit is examined regarding an independence model of fit, which is the standard of no fit at all. Since Chi-square is sensitive to the sample size and complex relationships between variables (Arbuckle, 1997), I depended on the CMIN/df. As for RMSEA, Brown and Cudeck (1993) suggested that values over 0.10 indicate a poor fit; between 0.08 and 0.10, a moderate fit; between 0.05 and 0.08, a reasonable fit; and less than 0.05 are taken to be a good fit. RMSEA was chosen because it estimates the fit of the model to a baseline population covariance matrix (Brown & Cudeck, 1993). As shown in Tables 28 for the t2/post, the fit of the factor model is satisfactory ( $X^2/df = 1.88 < 5$ ; IFI = .84, CFI = .84, TLI = .82, and RMSEA = .09).

**Tables 27: Model Fit Summary (PRE/T1)**

**CMIN**

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	139	1154.115	721	.000	<b>1.601</b>
Saturated model	860	.000	0		
Independence model	80	4350.039	780	.000	5.577

**Baseline Comparisons**

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
<b>Default model</b>	<b>.735</b>	<b>.713</b>	<b>.881</b>	<b>.869</b>	<b>.879</b>
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

**Parsimony-Adjusted Measures**

Model	PRATIO	PNFI	PCFI
Default model	.924	.679	.812

Model	PRATIO	PNFI	PCFI
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

### NCP

Model	NCP	LO 90	HI 90
Default model	433.115	344.367	529.773
Saturated model	.000	.000	.000
Independence model	3570.039	3366.636	3780.821

### FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	10.124	3.799	3.021	4.647
Saturated model	.000	.000	.000	.000
Independence model	38.158	31.316	29.532	33.165

### RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	<b>.073</b>	.065	.080	.000
Independence model	.200	.195	.206	.000

### AIC

Model	AIC	BCC	BIC	CAIC
Default model	1432.115	1588.252		
Saturated model	1720.000	2686.027		
Independence model	4510.039	4599.902		

### ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	12.562	11.784	13.410	13.932
Saturated model	15.088	15.088	15.088	23.562
Independence model	39.562	37.778	41.411	40.350

## HOELTER

Model	HOELTER	HOELTER
	.05	.01
Default model	78	81
Independence model	23	23

## Tables 28: Model Fit Summary (POST/T2)

### CMIN

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	139	1356.113	721	.000	1.881
Saturated model	860	.000	0		
Independence model	80	4664.666	780	.000	5.980

### Baseline Comparisons

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.709	.685	.839	.823	.837
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

### Parsimony-Adjusted Measures

Model	PRATIO	PNFI	PCFI
Default model	.924	.656	.773
Saturated model	.000	.000	.000
Independence model	1.000	.000	.000

### NCP

Model	NCP	LO 90	HI 90
Default model	635.113	535.180	742.844
Saturated model	.000	.000	.000
Independence model	3884.666	3673.171	4103.509

### FMIN

Model	FMIN	F0	LO 90	HI 90
Default model	11.896	5.571	4.695	6.516

Model	FMIN	F0	LO 90	HI 90
Saturated model	.000	.000	.000	.000
Independence model	40.918	34.076	32.221	35.996

### RMSEA

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.088	.081	.095	.000
Independence model	.209	.203	.215	.000

### AIC

Model	AIC	BCC	BIC	CAIC
Default model	1634.113	1790.250		
Saturated model	1720.000	2686.027		
Independence model	4824.666	4914.529		

### ECVI

Model	ECVI	LO 90	HI 90	MECVI
Default model	14.334	13.458	15.279	15.704
Saturated model	15.088	15.088	15.088	23.562
Independence model	42.322	40.466	44.241	43.110

### HOELTER

Model	HOELTER .05	HOELTER .01
Default model	66	69
Independence model	21	22

## 4.2 Study Results

Results of Harman's single factor test indicated that there was no single factor which was above the expected threshold of 50% (Podsakoff et al., 2003). H1 was tested

using a sample of 115 students belonging to the experimental group who have filled in the survey at both phases t1 (pretest) and at t2 (posttest). Hypothesis 1 states that at the end of the course (t2/post), students in the experimental group are expected to develop higher CRID, CSE, attitudes, desires, and intentions in comparison to the beginning of the course (t1/pre). To test the impact of entrepreneurship education courses (EECs) on the entrepreneurial intention and its proposed antecedents among students in higher education, I used a paired sample t-test to compare the mean values of the measures of intention and its antecedents before and after completion of the EEC. These results are detailed in Tables 29-31. As shown in Table 31, there is no significant impact, on average, after the EEC, if we consider the experimental sample who filled in the survey at t1 and t2. The three antecedents of entrepreneurial intention, CRID, CSE, and desires, have, on average, been only slightly affected by the EEC. However, this impact does not appear to be significant enough for the whole sample ( $p > .05$ ). An interesting finding is a significant decrease in attitudes toward entrepreneurship after the course ( $t = 2.31, p = .023$ ). Therefore, H1 is not supported.

**Table 29: Paired Sample Statistics**

GROUP			Mean	N	Std. Deviation	Std. Error Mean
EXP	Pair 1	CRID_PRE	3.72	115	0.83	0.08
		CRID_POST	3.76	115	0.90	0.08
	Pair 2	CSE_PRE	4.03	115	0.60	0.06
		CSE_POST	4.22	115	1.38	0.13
	Pair 3	ATT_PRE	4.02	115	0.52	0.05
		ATT_POST	3.90	115	0.66	0.06

	Pair 4	DES_PRE	3.82	115	0.86	0.08
		DES_POST	3.87	115	0.95	0.09
	Pair 5	INT_PRE	3.66	115	0.98	0.09
		INT_POST	3.59	115	1.11	0.10
CONTROL	Pair 1	CRID_PRE	2.89	66	0.90	0.11
		CRID_POST	2.97	66	0.83	0.10
	Pair 2	CSE_PRE	3.67	66	0.61	0.08
		CSE_POST	3.76	66	0.74	0.09
	Pair 3	ATT_PRE	3.42	66	0.60	0.07
		ATT_POST	3.36	66	0.59	0.07
	Pair 4	DES_PRE	2.81	66	0.91	0.11
		DES_POST	2.68	66	0.93	0.11
	Pair 5	INT_PRE	2.44	66	1.01	0.12
		INT_POST	2.34	66	0.91	0.11

**Table 30: Paired Sample Correlation**

GROUP			N	Correlation	Sig.
EXP	Pair 1	CRID_PRE & CRID_POST	115	0.51	0.00
	Pair 2	CSE_PRE & CSE_POST	115	0.26	0.00
	Pair 3	ATT_PRE & ATT_POST	115	0.58	0.00
	Pair 4	DES_PRE & DES_POST	115	0.79	0.00

	Pair 5	INT_PRE & INT_POST	115	0.82	0.00
CONTROL	Pair 1	CRID_PRE & CRID_POST	66	0.65	0.00
	Pair 2	CSE_PRE & CSE_POST	66	0.64	0.00
	Pair 3	ATT_PRE & ATT_POST	66	0.74	0.00
	Pair 4	DES_PRE & DES_POST	66	0.77	0.00
	Pair 5	INT_PRE & INT_POST	66	0.77	0.00

**Table 31: Paired Sample T- Test**

GROUP			Paired Differences					t	df	Sig. (2-tailed)
			Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
						Lower	Upper			
EXP	Pair 1	CRID_PRE - CRID_POST	-.03478	0.86	0.08	-.19322	0.12	-.435	114.00	<b>0.66</b>
	Pair 2	CSE_PRE - CSE_POST	-.18841	1.35	0.13	-.43808	0.06	1.495	114.00	<b>0.14</b>
	Pair 3	ATT_PRE - ATT_POST	0.12	0.55	0.05	0.02	0.22	2.31	114.00	<b>0.02</b>
	Pair 4	DES_PRE - DES_POST	-.04783	0.59	0.06	-.15740	0.06	-.865	114.00	<b>0.39</b>
	Pair 5	INT_PRE - INT_POST	0.06	0.64	0.06	-.05390	0.18	1.07	114.00	<b>0.29</b>
CONTROL	Pair 1	CRID_PRE - CRID_POST	-.07576	0.73	0.09	-.25517	0.10	-.843	65.00	0.40
	Pair 2	CSE_PRE - CSE_POST	-.09596	0.58	0.07	-.23881	0.05	1.342	65.00	0.18

Pair 3	ATT_PRE - ATT_POST	0.06	0.43	0.05	.04358-	0.17	1.17	65.00	0.25
Pair 4	DES_PRE - DES_POST	0.14	0.63	0.08	.01730-	0.29	1.77	65.00	0.08
Pair 5	INT_PRE - INT_POST	0.10	0.66	0.08	.06254-	0.26	1.22	65.00	0.23

Hypothesis 2A states that at the end of the course (t2/post), students in the experimental group are expected to develop higher creative role identities (CRIDs), creative self-efficacies (CSEs), attitudes (ATTs), desires(DES), and intentions (INTs) in comparison to students in the control group, controlling for the initial levels of these variables. H2A was tested on 115 students from the experimental group who filled in the survey at pretest and posttest in addition to 66 students from the control group who filled in the surveys at t1 and t2. I used one-way ANCOVA, with group (experimental versus control) to test the main and interaction effects of categorical variables. group (EXP/CTRL) in my study, on a continuous dependent variable (CRID POST, ATT POST, CSE POST, DESIRE POST, EI/INT POST) controlling for the effects of selected other continuous variables (CRID PRE, ATT PRE, CSE PRE, DESIRE PRE, EI/INT PRE), which co-vary with the dependent. As presented in Tables 32A-32E, results showed that ( $F = 6.47, p = .01$ ;  $F = 11.17, p = .00$ ;  $F = 4.05, p = .05$ ) for CRID POST, DESIRE POST, and EI/INT POST respectively, indicating that EXP/ CTRL does have a significant effect on CRID, DESIRE, and EI/INT controlling for the initial levels of CRID, DESIRE, and EI/INT. Actually, these results emphasize the influence of entrepreneurship education since they show that the entrepreneurship education courses positively influenced students' creative role identities, entrepreneurial desires, and entrepreneurial intentions. I controlled for the initial levels of these variables. Some studies show that the intensity of the influence of entrepreneurship education programs

depends on the initial levels of entrepreneurial intentions and previous entrepreneurial exposure (Fayolle & Gailly, 2015). Findings show that EXP/CTRL does not have a significant impact on CSE POST and ATT POST ( $F = 1.39, p = .24$ ;  $F = 1.49, p = .22$ ), controlling for the initial levels of CSE and attitudes. Therefore, H2A is partially supported.

**Tables 32A-E: Univariate Analysis of Variance**

**Between-Subjects Factors**

		Value Label	N
GROUP	1	EXP	115
	2	CONTROL	66

**A-Tests of Between-Subjects Effects**

**Dependent Variable: CRID\_POST**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	68.37 <sup>a</sup>	2	34.19	64.60	.00
Intercept	24.45	1	24.459	46.19	.00
CRID_PRE	42.41	1	42.41	80.13	.00
<b>GROUP</b>	<b>3.42</b>	<b>1</b>	<b>3.42</b>	<b>6.47</b>	<b>.01</b>
Error	94.21	178	.53		
Total	2341.50	181			
Corrected Total	162.58	180			

a. R Squared = .42 (Adjusted R Squared = .41)

**UNIANOVA CSE\_POST BY GROUP WITH CSE\_PRE**

**Univariate Analysis of Variance**

**Between-Subjects Factors**

		Value Label	N
GROUP	1	EXP	115
	2	CONTROL	66

**B-Tests of Between-Subjects Effects**

**Dependent Variable: CSE\_POST**

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	38.34 <sup>a</sup>	2	19.17	15.28	.00
Intercept	8.30	1	8.30	6.61	.01
CSE_PRE	29.44	1	29.44	23.47	.00
<b>GROUP</b>	<b>1.74</b>	<b>1</b>	<b>1.74</b>	<b>1.3985</b>	<b>.24</b>
Error	223.33	178	1.26		
Total	3238.22	181			
Corrected Total	261.67	180			

a. R Squared = .147 (Adjusted R Squared = .137)

**UNIANOVA ATT\_POST BY GROUP WITH ATT\_PRE**

**Univariate Analysis of Variance**

**Between-Subjects Factors**

		Value Label	N
GROUP	1	EXP	115
	2	CONTROL	66

### C-Tests of Between-Subjects Effects

Dependent Variable: ATT\_POST

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	41.69 <sup>a</sup>	2	20.84	86.14	.00
Intercept	3.21	1	3.21	13.27	.00
ATT_PRE	29.2548	1	29.25	120.86	.00
<b>GROUP</b>	<b>.36</b>	<b>1</b>	<b>.36</b>	<b>1.49</b>	<b>.22</b>
Error	43.08	178	.24		
Total	2568.24	181			
Corrected Total	84.76	180			

a. R Squared = .49 (Adjusted R Squared = .49)

### UNIANOVA DES\_POST BY GROUP WITH DES\_PRE

#### Univariate Analysis of Variance

##### Between-Subjects Factors

	Value Label	N
GROUP 1	EXP	115
2	CONTROL	66

### D-Tests of Between-Subjects Effects

Dependent Variable: DES\_POST

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	156.31 <sup>a</sup>	2	78.16	224.89	.00
Intercept	2.86	1	2.86	8.23	.01

DES_PRE	96.78	1	96.78	278.47	.00
<b>GROUP</b>	<b>3.88</b>	<b>1</b>	<b>3.88</b>	<b>11.17</b>	<b>.00</b>
Error	61.86	178	.35		
Total	2353.94	181			
Corrected Total	218.175	180			

a. R Squared = .72 (Adjusted R Squared = .71)

## UNIANOVA INT\_POST BY GROUP WITH INT\_PRE

### Univariate Analysis of Variance

#### Between-Subjects Factors

	Value Label	N
GROUP 1	EXP	115
2	CONTROL	66

#### E-Tests of Between-Subjects Effects

#### Dependent Variable: INT\_POST

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	190.77 <sup>a</sup>	2	95.39	243.27	.00
Intercept	2.70	1	2.70	6.88	.01
INT_PRE	124.90	1	124.90	318.55	.00
<b>GROUP</b>	<b>1.59</b>	<b>1</b>	<b>1.59</b>	<b>4.05</b>	<b>.05</b>
Error	69.79	178	.39		
Total	2041.97	181			
Corrected Total	260.57	180			

a. R Squared = .732 (Adjusted R Squared = .729)

Hypothesis 2B states that at the end of the course (t2/post), perceptions of formal learning (FL) and creative learning (CL) are expected to have a positive impact on intentions (EI/INT) among students in the repeated experimental group. Results in table 33A-33D reveal that perceptions of formal learning (FL) significantly influence students' intentions ( $p = .00$ ). Findings show that FL causes almost 19% ( $R^2 = 18.5$ ) of the variations in intentions. This finding provides empirical support for the idea that formal academic courses can have a positive impact on students' intentions to initiate an entrepreneurial venture. However, perceptions of CL do not significantly influence intentions ( $p = .32$ ). Therefore, H2B is partially supported.

**Tables 33A-D: Multiple Regression (IV: CL & FL, DV: INT) POST/EXP GROUP**

**A-Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	FL, CL <sup>b</sup>	.	Enter

a. Dependent Variable: INT

b. All requested variables entered.

**B. Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.43 <sup>a</sup>	.19	.17	1.01

a. Predictors: (Constant), FL, CL

**C. ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.12	2	13.06	12.74	.00 <sup>b</sup>
	Residual	114.83	112	1.03		
	Total	140.952	114			

a. Dependent Variable: INT

b. Predictors: (Constant), FL, CL

**D. Coefficients<sup>a</sup>**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		

1	(Constant)	1.21	.54		2.25	.03
	CL	.15	.16	.11	1.00	.32
	FL	.45	.14	.35	3.26	<b>.00</b>

a. Dependent Variable: INT

The results of SEM analysis, done on the t2/POST phase, provide solid support for some of the proposed hypotheses. Figure 8 presents my hypothetical model (H3-H12D). The red lines indicate positive direct relationships as per the SEM results, thus confirming my research hypotheses. The black lines indicate a lack of support for my research hypotheses as per the Sem results.

**Figure 8: The Hypothetical Model with SEM Results**

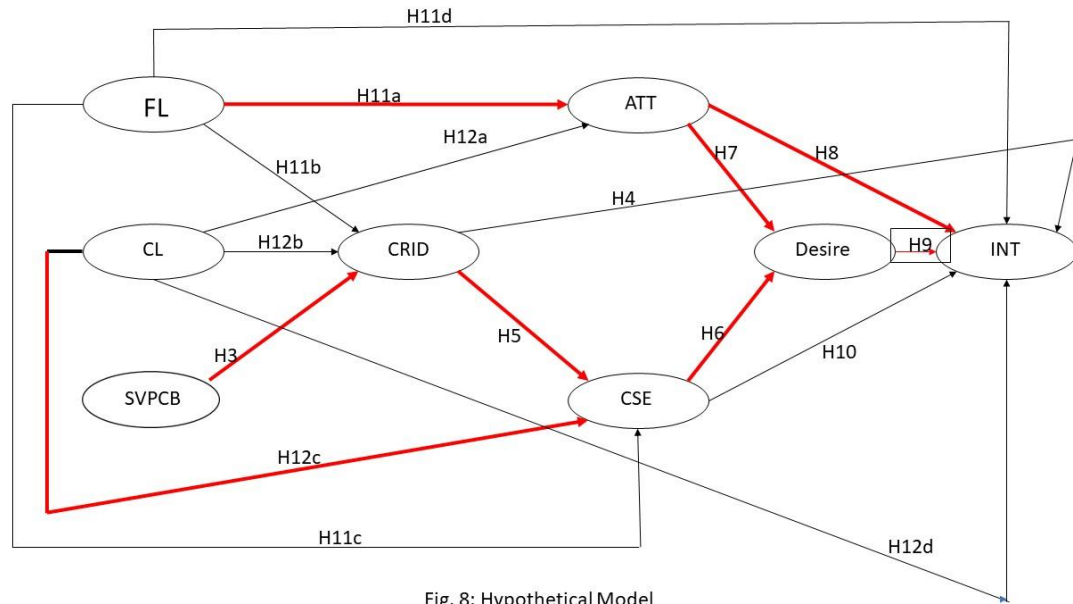


Fig. 8: Hypothetical Model

The entire SEM results appear in tables 34-37. However, Table 34 is the most significant table since it shows the coefficient of each hypothesized path and its corresponding CR (known as the *t*-value). Results in table 35 show the total effects, results in table 36 show the direct effects and results in table 37 show the indirect effects. Table 37A shows the proportion of the total variation explained by the mode. According to Chin 1998), relationships between variables with structural coefficients larger than .2 should be considered to be robust. H3 in regard to the path from SVPCB to CRID is supported where the value of *p* is less than  $\alpha=0.00$  and the size effect of SVPCB on CRID is .87. H4 regarding the path from CRID to entrepreneurial intentions is not supported. However, CRID is indirectly related to EIs ( $\beta = .04$ ). H5, regarding the path of CRID to CSE is supported where the size effect is .43 and P value is .00. H6, regarding the path from CSE to desires is supported at POST ( $\beta = .33$ ,  $p = .01$ ). This signification relationship between CSE and entrepreneurial desires highlights possible

future directions for the CSE research stream. In a relatively short period of time, CSE has shown promise as a key construct in the repertoire of entrepreneurial-related factors that might shed light on the complexities surrounding entrepreneurial engagement and performance. H7, regarding the path from attitudes toward entrepreneurship to desires, is supported where the value of  $p < .001$  and  $\beta = .99$ . H8, regarding the path from attitudes toward entrepreneurship to entrepreneurial intentions, is supported at posttest values,  $\beta = .53$  and  $p$  is less than  $.00$ . H9, regarding the path from desires to entrepreneurship intentions, is supported at post-test,  $\beta = .67$  and  $p$  is less than  $.00$ . The significant path between entrepreneurial desires and intentions shows that intentions can evolve, exhibiting phase changes. This finding draws on some of the perspectives of cognitive developmental psychology which has long noted that human psychosocial development happens in distinct stages connected by transition periods that are inherently experiential (Krueger & Day, 2010). Results of the SEM show that attitudes have both direct and indirect effects on intentions. The fact that attitudes have a direct influence on intentions implies that, in addition to inducing an intention to act through desire, they also have an automatic effect. H10, regarding the path from CSE to entrepreneurial intentions, is not supported. However, CSE is indirectly related to intentions ( $\beta = 0.22$ ). H11A, regarding the path from formal learning to attitudes is supported ( $\beta = .31$ ,  $p = .01$ ). H11B in regard to the path from FL to CRID is not supported. H11C in regard to the path from FL to CSE is not supported. H11D in regard to the path from FL to EIs is not supported. However, FL is indirectly related to entrepreneurial desires and intentions,  $\beta = .33$  and  $\beta = .41$  respectively. H12C, regarding the path from creative learning to CSE is supported ( $\beta = .19$ ,  $p = .06$ ). H12A in regard to the path from CL to attitudes is not supported. H12B in regard to the path from CL to CRID is not supported. H12D in regard to the

path from CL to EIs is not supported. As shown in table 36, the strongest direct impact on EI/INT after the course comes from desires ( $\beta = .67$ ) followed by attitudes ( $\beta = .53$ ).

**Table 34: Regression Weights/ EXP POST**

			Estimate	S.E.	C.R.	P
<b>CRID</b>	<---	<b>SVPCB</b>	<b>0.87</b>	<b>0.24</b>	<b>3.56</b>	<b>***</b>
<b>CRID</b>	<---	<b>CL</b>	<b>-0.07</b>	<b>0.12</b>	<b>-0.57</b>	<b>0.57</b>
<b>CRID</b>	<---	<b>FL</b>	<b>0.16</b>	<b>0.11</b>	<b>1.44</b>	<b>0.15</b>
<b>CSE</b>	<---	<b>CRID</b>	<b>0.43</b>	<b>0.14</b>	<b>3.07</b>	<b>0.00</b>
<b>CSE</b>	<---	<b>FL</b>	<b>0.01</b>	<b>0.10</b>	<b>0.06</b>	<b>0.96</b>
<b>ATT</b>	<---	<b>FL</b>	<b>0.31</b>	<b>0.11</b>	<b>2.75</b>	<b>0.01</b>
<b>CSE</b>	<---	<b>CL</b>	<b>0.19</b>	<b>0.10</b>	<b>1.91</b>	<b>0.06</b>
<b>ATT</b>	<---	<b>CL</b>	<b>0.07</b>	<b>0.13</b>	<b>0.56</b>	<b>0.58</b>
<b>DES</b>	<---	<b>ATT</b>	<b>0.99</b>	<b>0.14</b>	<b>7.08</b>	<b>***</b>
<b>DES</b>	<---	<b>CSE</b>	<b>0.33</b>	<b>0.12</b>	<b>2.66</b>	<b>0.01</b>
<b>INT</b>	<---	<b>ATT</b>	<b>0.53</b>	<b>0.14</b>	<b>3.83</b>	<b>***</b>
<b>INT</b>	<---	<b>DES</b>	<b>0.67</b>	<b>0.10</b>	<b>6.57</b>	<b>***</b>
<b>INT</b>	<---	<b>CSE</b>	<b>-0.13</b>	<b>0.14</b>	<b>-0.97</b>	<b>0.33</b>
<b>INT</b>	<---	<b>FL</b>	<b>0.11</b>	<b>0.10</b>	<b>1.04</b>	<b>0.30</b>
<b>INT</b>	<---	<b>CRID</b>	<b>0.21</b>	<b>0.15</b>	<b>1.43</b>	<b>0.15</b>
<b>INT</b>	<---	<b>CL</b>	<b>-0.10</b>	<b>0.10</b>	<b>-0.96</b>	<b>0.34</b>
ATT_1A	<---	ATT	1.00			
ATT_2A	<---	ATT	1.38	0.16	8.56	***
ATT_3A	<---	ATT	1.24	0.15	8.37	***
ATT_4A	<---	ATT	1.29	0.15	8.66	***
ATT_5A	<---	ATT	1.59	0.18	8.63	***
ATT_2B	<---	ATT	-0.39	0.16	-2.40	0.02
ATT_4B	<---	ATT	0.41	0.12	3.56	***
ATT_5B	<---	ATT	0.88	0.14	6.20	***
ATT_6B	<---	ATT	0.64	0.13	5.11	***
ATT_7B	<---	ATT	0.87	0.14	6.10	***
ATT_8B	<---	ATT	0.88	0.15	5.91	***
INT_1A	<---	INT	1.00			
INT_2A	<---	INT	1.13	0.07	15.95	***
INT_3A	<---	INT	1.05	0.07	15.11	***
INT_4A	<---	INT	1.04	0.07	15.94	***
INT_5A	<---	INT	0.90	0.07	12.85	***
INT_6A	<---	INT	0.97	0.06	15.08	***
DES_1	<---	DES	1.00			
DES_2	<---	DES	0.93	0.08	12.45	***

DES_3	<---	DES	1.05	0.07	16.17	***
DES_4	<---	DES	0.94	0.07	13.31	***
CSE_2	<---	CSE	1.00			
CSE_3	<---	CSE	1.29	0.17	7.72	***
CL_1	<---	CL	1.00			
CL_2	<---	CL	1.01	0.07	13.53	***
CL_3	<---	CL	1.04	0.08	13.15	***
FL_1	<---	FL	1.00			
FL_2	<---	FL	0.96	0.06	14.82	***
FL_3	<---	FL	0.79	0.10	7.65	***
FL_4	<---	FL	0.92	0.10	9.54	***
SVPCB_1	<---	SVPCB	1.00			
SVPCB_2	<---	SVPCB	1.50	0.26	5.79	***
SVPCB_3	<---	SVPCB	1.20	0.20	6.09	***
SVPCB_5	<---	SVPCB	1.11	0.21	5.30	***
SVPCB_6	<---	SVPCB	1.33	0.22	5.99	***
SVPCB_7	<---	SVPCB	1.48	0.25	5.99	***
SVPCB_8	<---	SVPCB	1.22	0.24	5.04	***
CRID_1	<---	CRID	1.00			
CRID_3	<---	CRID	1.44	0.25	5.83	***
SVPCB_4	<---	SVPCB	0.37	0.22	1.70	0.09

**Table 35: Total Effects/ EXP POST**

	FL	CL	SVPCB	CRID	CSE	ATT	DES	INT
CRID	0.16	-0.07	0.87	0.00	0.00	0.00	0.00	0.00
CSE	0.08	0.16	0.37	0.43	0.00	0.00	0.00	0.00
ATT	0.31	0.07	0.00	0.00	0.00	0.00	0.00	0.00
DES	0.33	0.12	0.12	0.14	0.33	0.99	0.00	0.00
INT	0.52	-0.02	0.22	0.25	0.08	1.19	0.67	0.00
SVPCB_4	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00
CRID_3	0.23	-0.10	1.25	1.44	0.00	0.00	0.00	0.00
CRID_1	0.16	-0.07	0.87	1.00	0.00	0.00	0.00	0.00
SVPCB_8	0.00	0.00	1.22	0.00	0.00	0.00	0.00	0.00
SVPCB_7	0.00	0.00	1.48	0.00	0.00	0.00	0.00	0.00
SVPCB_6	0.00	0.00	1.33	0.00	0.00	0.00	0.00	0.00
SVPCB_5	0.00	0.00	1.11	0.00	0.00	0.00	0.00	0.00
SVPCB_3	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00
SVPCB_2	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00

SVPCB_1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
FL_4	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL_3	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL_2	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL_1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CL_3	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00
CL_2	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00
CL_1	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
CSE_3	0.10	0.20	0.48	0.55	1.29	0.00	0.00	0.00
CSE_2	0.08	0.16	0.37	0.43	1.00	0.00	0.00	0.00
DES_4	0.31	0.11	0.11	0.13	0.31	0.93	0.94	0.00
DES_3	0.35	0.13	0.13	0.15	0.34	1.04	1.05	0.00
DES_2	0.31	0.11	0.11	0.13	0.30	0.92	0.93	0.00
DES_1	0.33	0.12	0.12	0.14	0.33	0.99	1.00	0.00
INT_6A	0.50	-0.02	0.21	0.24	0.08	1.16	0.65	0.97
INT_5A	0.46	-0.01	0.19	0.22	0.08	1.07	0.60	0.90
INT_4A	0.54	-0.02	0.23	0.26	0.09	1.24	0.70	1.04
INT_3A	0.54	-0.02	0.23	0.26	0.09	1.26	0.71	1.05
INT_2A	0.58	-0.02	0.24	0.28	0.09	1.34	0.75	1.13
INT_1A	0.52	-0.02	0.22	0.25	0.08	1.19	0.67	1.00

**Table 35: Total Effects/ EXP POST (Continued)**

ATT_8B	0.27	0.06	0.00	0.00	0.00	0.88	0.00	0.00
ATT_7B	0.27	0.06	0.00	0.00	0.00	0.87	0.00	0.00
ATT_6B	0.20	0.05	0.00	0.00	0.00	0.64	0.00	0.00
ATT_5B	0.27	0.06	0.00	0.00	0.00	0.88	0.00	0.00
ATT_4B	0.13	0.03	0.00	0.00	0.00	0.41	0.00	0.00
ATT_2B	-0.12	-0.03	0.00	0.00	0.00	-0.39	0.00	0.00
ATT_5A	0.49	0.11	0.00	0.00	0.00	1.59	0.00	0.00
ATT_4A	0.40	0.09	0.00	0.00	0.00	1.29	0.00	0.00
ATT_3A	0.38	0.09	0.00	0.00	0.00	1.24	0.00	0.00
ATT_2A	0.43	0.10	0.00	0.00	0.00	1.38	0.00	0.00
ATT_1A	0.31	0.07	0.00	0.00	0.00	1.00	0.00	0.00

**Table 36: Direct Effects / EXP POST**

	FL	CL	SVPCB	CRID	CSE	ATT	DES	INT
CRID	0.16	-0.07	0.87	0.00	0.00	0.00	0.00	0.00
CSE	0.01	0.19	0.00	0.43	0.00	0.00	0.00	0.00
ATT	0.31	0.07	0.00	0.00	0.00	0.00	0.00	0.00
DES	0.00	0.00	0.00	0.00	0.33	0.99	0.00	0.00
INT	0.11	-0.10	0.00	0.21	-0.13	0.53	0.67	0.00
SVPCB_4	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00
CRID_3	0.00	0.00	0.00	1.44	0.00	0.00	0.00	0.00
CRID_1	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
SVPCB_8	0.00	0.00	1.22	0.00	0.00	0.00	0.00	0.00
SVPCB_7	0.00	0.00	1.48	0.00	0.00	0.00	0.00	0.00
SVPCB_6	0.00	0.00	1.33	0.00	0.00	0.00	0.00	0.00
SVPCB_5	0.00	0.00	1.11	0.00	0.00	0.00	0.00	0.00
SVPCB_3	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00
SVPCB_2	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00
SVPCB_1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
FL_4	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL_3	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL_2	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL_1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CL_3	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00
CL_2	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00

**Table 36: Direct Effects / EXP POST (Continued)**

CL_1	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00
CSE_3	0.00	0.00	0.00	0.00	1.29	0.00	0.00	0.00
CSE_2	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
DES_4	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.00
DES_3	0.00	0.00	0.00	0.00	0.00	0.00	1.05	0.00
DES_2	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00
DES_1	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
INT_6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97
INT_5A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90
INT_4A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04
INT_3A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05
INT_2A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13

INT_1A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
ATT_8B	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00
ATT_7B	0.00	0.00	0.00	0.00	0.00	0.87	0.00	0.00
ATT_6B	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00
ATT_5B	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00
ATT_4B	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00
ATT_2B	0.00	0.00	0.00	0.00	0.00	-0.39	0.00	0.00
ATT_5A	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00
ATT_4A	0.00	0.00	0.00	0.00	0.00	1.29	0.00	0.00
ATT_3A	0.00	0.00	0.00	0.00	0.00	1.24	0.00	0.00
ATT_2A	0.00	0.00	0.00	0.00	0.00	1.38	0.00	0.00
ATT_1A	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

**Table 37: Indirect Effects / EXP POST**

	FL	CL	SVPCB	CRID	CSE	ATT	DES	INT
CRID	0.16	-0.07	0.87	0.00	0.00	0.00	0.00	0.00
CSE	0.01	0.19	0.00	0.43	0.00	0.00	0.00	0.00
ATT	0.31	0.07	0.00	0.00	0.00	0.00	0.00	0.00
DES	0.00	0.00	0.00	0.00	0.33	0.99	0.00	0.00
INT	0.11	-0.10	0.00	0.21	-0.13	0.53	0.67	0.00
SVPCB_4	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00
CRID_3	0.00	0.00	0.00	1.44	0.00	0.00	0.00	0.00
CRID_1	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00
SVPCB_8	0.00	0.00	1.22	0.00	0.00	0.00	0.00	0.00
SVPCB_7	0.00	0.00	1.48	0.00	0.00	0.00	0.00	0.00
SVPCB_6	0.00	0.00	1.33	0.00	0.00	0.00	0.00	0.00
SVPCB_5	0.00	0.00	1.11	0.00	0.00	0.00	0.00	0.00

**Table 37: Indirect Effects / EXP POST (Continued)**

SVPCB_3	0.00	0.00	1.20	0.00	0.00	0.00	0.00	0.00
SVPCB_2	0.00	0.00	1.50	0.00	0.00	0.00	0.00	0.00
SVPCB_1	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
FL_4	0.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL_3	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL_2	0.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00
FL_1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CL_3	0.00	1.04	0.00	0.00	0.00	0.00	0.00	0.00
CL_2	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00
CL_1	0.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00

CSE_3	0.00	0.00	0.00	0.00	1.29	0.00	0.00	0.00
CSE_2	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00
DES_4	0.00	0.00	0.00	0.00	0.00	0.00	0.94	0.00
DES_3	0.00	0.00	0.00	0.00	0.00	0.00	1.05	0.00
DES_2	0.00	0.00	0.00	0.00	0.00	0.00	0.93	0.00
DES_1	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00
INT_6A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97
INT_5A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.90
INT_4A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.04
INT_3A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.05
INT_2A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13
INT_1A	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.00
ATT_8B	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00
ATT_7B	0.00	0.00	0.00	0.00	0.00	0.87	0.00	0.00
ATT_6B	0.00	0.00	0.00	0.00	0.00	0.64	0.00	0.00
ATT_5B	0.00	0.00	0.00	0.00	0.00	0.88	0.00	0.00
ATT_4B	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.00
ATT_2B	0.00	0.00	0.00	0.00	0.00	-0.39	0.00	0.00
ATT_5A	0.00	0.00	0.00	0.00	0.00	1.59	0.00	0.00
ATT_4A	0.00	0.00	0.00	0.00	0.00	1.29	0.00	0.00
ATT_3A	0.00	0.00	0.00	0.00	0.00	1.24	0.00	0.00
ATT_2A	0.00	0.00	0.00	0.00	0.00	1.38	0.00	0.00
ATT_1A	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00

**Table 37A: Squared Multiple Correlations: (Group number 1 - Default model)**

	Estimate
CRID	.59
CSE	.43
ATT	.21
DES	.64
INT	.85
SVPCB_4	.03
CRID_3	.56
CRID_1	.44
SVPCB_8	.33
SVPCB_7	.54
SVPCB_6	.54
SVPCB_5	.38
SVPCB_3	.57

	Estimate
SVPCB_2	.49
SVPCB_1	.35
FL_4	.51
FL_3	.38
FL_2	.80
FL_1	.87
CL_3	.78
CL_2	.80
CL_1	.79
CSE_3	.88
CSE_2	.61
DES_4	.70
DES_3	.81
DES_2	.66
DES_1	.87
INT_6A	.85
INT_5A	.73
INT_4A	.88
INT_3A	.85
INT_2A	.88
INT_1A	.77
ATT_8B	.34
ATT_7B	.37
ATT_6B	.25
ATT_5B	.38
ATT_4B	.12
ATT_2B	.05
ATT_5A	.80
ATT_4A	.81
ATT_3A	.744
ATT_2A	.783
ATT_1A	.456

I conducted tests of mediation to determine the degrees of mediation for some of the constructs. According to Baron and Kenny (1986), mediation is tested through three regression models: a regression model predicting the dependent variable from the independent one; a regression model predicting the mediator variable from the independent one; regression model predicting the dependent variable from both the independent variable and the mediator. These models test the four conditions of

mediation: (1) the independent variable must significantly affect the dependent variable in model 1, (2) the independent variable must significantly affect the mediator variable in model 2, (3) the mediator variable must significantly affect the dependent variable in model 3, and (4) the independent variable must affect the dependent variable less strongly in model 3 than in model 1. Results in Table 38 show that desires partially mediated the relationship between attitudes and EIs. On the other hand, desires fully mediated the relationship between CSE and intentions toward entrepreneurship, as shown in Table 39. My model explains almost 64% (R<sup>2</sup>) of the variance of desire, 85% of the variance of intentions to become an entrepreneur, 20% of the variance in attitudes, 43% of the variance in CSE, and 59% of the variance in CRID

**Table 38: Tests of Mediation (ATT, DESIRE, INT)**

**MODEL (1):**

**Regression**

**A-Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	ATT <sup>b</sup>	.	Enter

a. Dependent Variable: INT

**B-Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.76 <sup>a</sup>	.57	.57	.73

a. Predictors: (Constant), ATT

### C-ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	80.745	1	80.75	151.56	.00 <sup>b</sup>
	Residual	60.20	113	.53		
	Total	140.95	114			

a. Dependent Variable: INT/. Predictors: (Constant), ATT

### D-Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.39	.41		-3.38	.00
	ATT	<b>1.28</b>	.10	.76	12.31	<b>.00</b>

a. Dependent Variable: INT

### Regression

#### E-Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	ATT <sup>b</sup>	.	Enter

a. Dependent Variable: DES

### F-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.64 <sup>a</sup>	.41	.41	.73

a. Predictors: (Constant), ATT

### G-ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	42.26	1	42.26	79.22	.00 <sup>b</sup>
	Residual	60.28	113	.53		
	Total	102.54	114			

a. Dependent Variable: DES/ Predictors: (Constant), ATT

### H-Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.27	.41		.65	.52
	ATT	.92	.10	.64	8.90	.00

a. Dependent Variable: DES

## MODEL (3)

### Regression

#### I-Variables Entered/Removed

Model	Variables Entered	Variables Removed	Method
1	DES, ATT <sup>b</sup>	.	Enter

a. Dependent Variable: INT

### J-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.89 <sup>a</sup>	.79	.79	.51

a. Predictors: (Constant), DES, ATT

### K-ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	111.89	2	55.95	215.63	.00 <sup>b</sup>
	Residual	29.06	112	.26		
	Total	140.95	114			

a. Dependent Variable: INT/ Predictors: (Constant), DES, ATT

### L-Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-1.577-	.29		-5.50-	.00
	ATT	.61	.09	.36	6.49	.00
	DES	.72	.07	.61	10.96	.00

a. Dependent Variable: INT

## Table 39: Tests of Mediation (CSE, DESIRE, INT)

### MODEL (1)

#### Regression

##### A-Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
-------	-------------------	-------------------	--------

1	CSE <sup>b</sup>	.	Enter
---	------------------	---	-------

a. Dependent Variable: INT

### B-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.34 <sup>a</sup>	.12	.11	1.05

a. Predictors: (Constant), CSE

### C-ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	16.35	1	16.35	14.83	.00 <sup>b</sup>
	Residual	124.60	113	1.10		
	Total	140.95	114			

a. Dependent Variable: INT/ Predictors: (Constant), CSE

### D-Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.207	.63		1.90	.06
	CSE	.58	.15	.34	3.85	.00

a. Dependent Variable: INT

## MODEL (2)

### Regression

#### E-Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	CSE <sup>b</sup>	.	Enter

a. Dependent Variable: DES

b. All requested variables entered.

### F-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.345	.12	.11	.89

a. Predictors: (Constant), CSE

### G-ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	12.45	1	12.45	15.61	.00 <sup>b</sup>
	Residual	90.10	113	.80		
	Total	102.54	114			

a. Dependent Variable: DE/ Predictors: (Constant), CSE S

### H-Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.778	.534		3.32	.00
	CSE	.51	.3	.35	3.95	.00

a. Dependent Variable: DES

### Regression

### I-Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	DES, CSE <sup>b</sup>	.	Enter

a. Dependent Variable: INT

### J-Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.848 <sup>a</sup>	.72	.714	.60

a. Predictors: (Constant), DES, CSE

### K-ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	101.29	2	50.65	143.02	.00 <sup>b</sup>
	Residual	39.66	112	.35		
	Total	140.95	114			

a. Dependent Variable: INT/ Predictors: (Constant), DES, CSE

### L-Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.53	.37		-1.41	.16
	<b>CSE</b>	.09	.09	.05	.973	<b>.33</b>
	<b>DES</b>	.97	.06	.83	15.49	<b>.00</b>

a. Dependent Variable: INT

H13, H13A, H13B, H13C, and H13D were tested on the experimental and the control groups who filled in the surveys at t1 and t2 (N = 181). H13 states that the interaction between attitudes toward entrepreneurship and CSE will result in four distinct profiles: high attitudes x high CSE (high/high condition); high attitudes x low CSE (high/low condition); low attitudes and high CSE (low/high condition); and low attitudes and low CSE (low/low condition). It was tested using regression to investigate the relationship between entrepreneurial intentions (as the dependent variable) and my measures of attitudes and creative self-efficacy, controlling for gender, previous

experience in owning or managing a business (OWN), and having a parent entrepreneur (PAR). Attitudes and CSE were first entered to form the base. In the following step, I added the interaction effects. Finally, the full model using control variables were tested. Results in table 40A-40L show that while attitudes contributed significantly to EIs/INT ( $p = .00$ ), CSE had no significant contribution ( $p = .66$ ). Contrary to my expectations, findings reveal that the interaction effect had no significant contribution to intentions ( $p = .21$ ). Even with the control variables entered the model, the interaction had no significant effect ( $p = .16$ ). Among the control variables which contributed significantly to intentions was PAR (having a parent entrepreneur).

**Tables 40A-L: Interaction effects**

**ATT & CSE -----> INT**

**Regression**

**A. Variables Entered/Removed<sup>a</sup>**

Model	Variables Entered	Variables Removed	Method
1	CSE, ATT <sup>b</sup>	.	Enter

a. Dependent Variable: INT

**B. Model Summary**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.85 <sup>a</sup>	.73	.73	.60

a. Predictors: (Constant), CSE, ATT

**C. ANOVA<sup>a</sup>**

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	173.82	2	86.91	240.57	.00 <sup>b</sup>

Residual	64.31	178	.36		
Total	238.13	180			

a. Dependent Variable: INT b. Predictors: (Constant), CSE, ATT

#### D. Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-2.70	.33		-8.12	.00
	ATT	1.59	.078	.86	20.19	.00
	CSE	-.04	.08	-.02	-.45	.66

a. Dependent Variable: INT

### ATT, CSE & Interaction -----> INT

#### Regression

#### E. Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	Interaction, CSE, ATT <sup>b</sup>	.	Enter

a. Dependent Variable: INT

#### F. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.86 <sup>a</sup>	.73	.73	.60

#### G. ANOVA<sup>a</sup>

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	174.39	3	58.13	161.42	.00 <sup>b</sup>
	Residual	63.74	177	.36		
	Total	238.13	180			

a. Dependent Variable: INT/ Predictors: (Constant), Interaction, CSE, ATT

### H. Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.91	1.46		-.63	.53
	ATT	1.10	.40	.60	2.76	.01
	CSE	-.496	.38	-.27	-1.32	.19
	Interaction	.13	.10	.44	1.25	.21

a. Dependent Variable: INT

### ATT , CSE & Interaction -----> INT (WITH CONTROL VARIABLES)

#### Regression

#### I. Variables Entered/Removed<sup>a</sup>

Model	Variables Entered	Variables Removed	Method
1	PAR, GENDER, CSE, OWN, ATT, Interaction <sup>b</sup>	.	Enter

a. Dependent Variable: INT

b. All requested variables entered.

#### J. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.87 <sup>a</sup>	.75	.74	.58

a. Predictors: (Constant), PAR, GENDER, CSE, OWN, ATT, Interaction

#### K. ANOVA<sup>a</sup>

Model	Sum of Squares	df	Mean Square	F	Sig.
-------	----------------	----	-------------	---	------

1	Regression	178.95	6	29.83	87.69	.00 <sup>b</sup>
	Residual	59.18	174	.34		
	Total	238.13	180			

a. Dependent Variable: INT b. Predictors: (Constant), PAR, GENDER, CSE, OWN, ATT, Interaction

#### L. Coefficients<sup>a</sup>

Model		Unstandardized Coefficients		Standardized	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.45	1.44		-.31	.75
	ATT	.95	.40	.51	2.40	<b>.02</b>
	CSE	-.57	.37	-.31	-1.53	<b>.13</b>
	Interaction	.14	.10	.48	1.40	<b>.16</b>
	GENDER	.09	.09	.04	.95	.34
	OWN	.19	.11	.07	1.645	.10
	PAR	.26	.09	.11	2.77	.01

a. Dependent Variable: INT

H13A states that high attitudes and high CSE will result in the highest desires and EIs/INT. H13B, states that high attitudes and low CSE will result in the third highest desires and EIs/INT. H13C states that low attitudes and high CSE will result in the second highest desires and EIs/INT. H13D states that low attitudes and low CSE will result in the lowest desires and EIs. The hypotheses were tested using multivariate analysis (one-way MANOVA). The multivariate tests Pillai's Trace, Wilks' Lambda, Hotelling's Trace and Roy's Largest Root are the names of the different statistics that can be used to test the statistical significance of the differences between groups (Tabachnick & Fidell, 1996). While increasing values of both Pillai's Trace and Hotelling's Trace mean that effects are contributing more to the model, a Wilks' Lambda value of zero is

ideal as it means that there is not any variance not explained by the independent variable (Tabachnick & Fidell, 1996)..

As shown in tables 41A-41G, cross-classification between ATT and CSE result in four sub-groups (categories) : L(ATT)L (CSE), L(ATT) H(CSE), H(ATT) L(CSE), and H(ATT) H(CSE). To classify into high/low combinations, I used the median split to arrive at the post hoc tests and. As presented in tables 41A-41G, results show that (Wilks' Lambda = .47, F = 26.90, p-value = .00 < .05) indicating that there are significant differences in the means of at least two profiles. Regarding the *intentional* outcomes of the profiles (see table 41D), H13A (H(ATT) H(CSE) is supported in that the order in magnitude of mean EIs scores occurred as predicted (M = 4.12). As shown in tables 41DH(ATT) L (CSE) results in the second highest level of intentions (M = 4.03). The difference between H (ATT) H(CSE) and H(ATT) L(CSE) profiles is statistically non-significant. Contrary to my predictions, while L(ATT) L(CSE) results in the third highest level of intentions (M = 2.44), L(ATT) H(CSE) results in the lowest levels of intentions (M = 2.42), though the differences between the two profiles are statistically non-significant. As shown in table 41F, there are significant differences between the means of at least two profiles. As for the typology of entrepreneurs resulting from the high/low combinations of attitudes and CSE in my study, results in table 41G show that there are no significant differences in the mean scores of intentions between natural, H(ATT) H(CSE), and inevitable entrepreneurs, H(ATT) L (CSE). Similarly (see table 41G), there are also no significant differences in the mean scores between abstainers L(ATT)L(CSE) and accidental entrepreneurs H(CSE), L(ATT). Findings suggest that intentions might be high not only for those with both high attitudes and high

CSE, but also for those with high/low combinations of these two main effects. Figure 9 displays the results of H13a-H13d

**Figure 9: The 2\*2 Model Post the Results**

	Low CSE	High CSE
Low ATT	3. Third Highest INT (No Significant Differences between 3 &4)	4. Lowest INT
High ATT	2. Second Highest INT (No Significant Differences between 1 &2)	1 Highest INT

Fig. 9: The 2\*2 Model Post the Results

**Tables 41A-G: TWO-WAY ANOVA:**

**ATT (LOW/HIGH) , CSE (LOW/HIGH) AND INTERACTION ---- > INT**

**Univariate Analysis of Variance**

**A. Between-Subjects Factors**

	Value Label	N
ATT_CAT .00	LOW	85
	1.00 HIGH	96
CSE_CAT .00	LOW	76
	1.00 HIGH	105

### B. Tests of Between-Subjects Effects

Dependent Variable: INT

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	130.10 <sup>a</sup>	3	43.37	71.045	.00
Intercept	1615.14	1	1615.14	2646.20	.00
ATT_CAT	113.46	1	113.46	185.89	<b>.00</b>
CSE_CAT	.21	1	.21	.34	<b>.56</b>
ATT_CAT * CSE_CAT	.11	1	.11	.18	<b>.678</b>
Error	108.03	177	.61		
Total	2107.39	181			
Corrected Total	238.13	180			

a. R Squared = .546 (Adjusted R Squared = .539)

### General Linear Model

#### C. Between-Subjects Factors

		Value Label	N
GROUPS	11	L (ATT) L (CSE)	54
	12	L H	42
	21	H L	22
	22	H H	63

#### D. Descriptive Statistics

	GROUPS	Mean	Std. Deviation	N
DES_PRE	L (ATT) L (CSE)	2.83	.86	54
	L H	2.88	.93	42

	H L	4.01	.54	22
	H H	4.17	.64	63
	Total	3.45	1.00	181
INT_PRE	L (ATT) L (CSE)	<b>2.44</b>	.8	54
	L H	<b>2.42</b>	.93	42
	H L	<b>4.03</b>	.64	22
	H H	<b>4.12</b>	.68	63
	Total	3.21	1.15	181

### E. Multivariate Tests<sup>a</sup>

Effect		Value	F	Hypothesis df	Error df	Sig.
Intercept	Pillai's Trace	.95	1599.05 <sup>b</sup>	2.00	176.00	.00
	Wilks' Lambda	.05	1599.05 <sup>b</sup>	2.00	176.00	.00
	Hotelling's Trace	18.17	1599.05 <sup>b</sup>	2.00	176.00	.00
	Roy's Largest Root	18.17	1599.05 <sup>b</sup>	2.00	176.00	.00
GROUPS	Pillai's Trace	.53	21.45	6.00	354.00	.00
	Wilks' Lambda	.47	26.90 <sup>b</sup>	6.00	352.00	.00
	Hotelling's Trace	1.12	32.68	6.00	350.00	.00
	Roy's Largest Root	1.11	65.75 <sup>c</sup>	3.00	177.00	.00

a. Design: Intercept + GROUPS b. Exact Statistic C. The statistic is an upper bound on F that yields a lower bound on the significance level

### F. Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	DES_PRE	74.14 <sup>a</sup>	3	24.71	41.11	.000
	INT_PRE	125.50 <sup>b</sup>	3	41.84	65.75	.000
Intercept	DES_PRE	1864.03	1	1864.03	3100.33	.000
	INT_PRE	1632.91	1	1632.91	2566.27	.000

GROUPS	DES_PRE	74.14	3	24.71	41.11	<b>.000</b>
	INT_PRE	125.50	3	41.84	65.75	<b>.000</b>
Error	DES_PRE	106.42	177	.60		
	INT_PRE	112.63	177	.634		
Total	DES_PRE	2340.44	181			
	INT_PRE	2107.39	181			
Corrected Total	DES_PRE	180.56	180			
	INT_PRE	238.13	180			

a. R Squared = .411 (Adjusted R Squared = .401)    b. . R Squared = .527 (Adjusted R Squared = .519)

## Post Hoc Tests

### GROUPS

#### G. Multiple Comparisons

LSD

Dependent Variable	(I) GROUPS	(J) GROUPS	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval		
						Lower Bound	Upper Bound	
DES_PRE	L (ATT)	L (CSE)	L H	-.0476-	.15953	<b>.766</b>	-.3624-	.2672
			H L	-1.1780*	.19612	.000	-1.5651-	-.7910-
			H H	-1.3413*	.14380	.000	-1.6250-	-1.0575-
	L H	L (ATT)	L (CSE)	.0476	.15953	<b>.766</b>	-.2672-	.3624
			H L	-1.1304*	.20407	.000	-1.5331-	-.7277-
			H H	-1.2937*	.15446	.000	-1.5985-	-.9888-
	H L	L (ATT)	L (CSE)	1.1780*	.19612	.000	.7910	1.5651
			L H	1.1304*	.20407	.000	.7277	1.5331
			H H	-.1632-	.19202	<b>.396</b>	-.5422-	.2157
	H H	L (ATT)	L (CSE)	1.3413*	.14380	.000	1.0575	1.6250
			L H	1.2937*	.15446	.000	.9888	1.5985

			H L	.1632	.19202	<b>.396</b>	-.2157-	.5422
INT_PRE	L (ATT)	L (CSE)	L H	.0247	.16411	<b>.881</b>	-.2992-	.3486
			H L	-1.5889*	.20176	.000	-1.9871-	-1.1908-
			H H	-1.6803*	.14793	.000	-1.9723-	-1.3884-
	L H		L (ATT)	-.0247-	.16411	<b>.881</b>	-.3486-	.2992
			L (CSE)					
			H L	-1.6136*	.20993	.000	-2.0279-	-1.1993-
			H H	-1.7050*	.15890	.000	-2.0186-	-1.3914-
	H L		L (ATT)	1.5889*	.20176	.000	1.1908	1.9871
			L (CSE)					
			L H	1.6136*	.20993	.000	1.1993	2.0279
			H H	-.0914-	.19754	<b>.644</b>	-.4812-	.2984
	H H		L (ATT)	1.6803*	.14793	.000	1.3884	1.9723
			L (CSE)					
			L H	1.7050*	.15890	.000	1.3914	2.0186
			H L	.0914	.19754	<b>.644</b>	-.2984-	.4812

Based on observed means. The error term is Mean Square(Error) = .636. The mean difference is significant at the .05 level

Dependent Variable	(I) GROUPS	(J) GROUPS	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
DES_P R E	L (ATT) L (CSE)	L H	-.0476-	0.16	0.77	-.3624-	0.27
		H L	-1.1780*	0.20	0.00	-1.5651-	-.7910-
		H H	-1.3413*	0.14	0.00	-1.6250-	-1.0575-
	L H	L (ATT) L (CSE)	0.05	0.16	0.77	-.2672-	0.36
		H L	-1.1304*	0.20	0.00	-1.5331-	-.7277-
		H H	-1.2937*	0.15	0.00	-1.5985-	-.9888-
	H L	L (ATT) L (CSE)	1.1780*	0.20	0.00	0.79	1.57
		L H	1.1304*	0.20	0.00	0.73	1.53
		H H	-.1632-	0.19	0.40	-.5422-	0.22
	H H	L (ATT) L (CSE)	1.3413*	0.14	0.00	1.06	1.63
		L H	1.2937*	0.15	0.00	0.99	1.60
		H L	0.16	0.19	0.40	-.2157-	0.54
INT_PRE	L (ATT) L (CSE)	L H	0.02	0.16	0.88	-.2992-	0.35
		H L	-1.5889*	0.20	0.00	-1.9871-	-1.1908-

	H H	-1.6803*	0.15	0.00	-1.9723-	-1.3884-
L H	L (ATT) L (CSE)	-.0247-	0.16	0.88	-.3486-	0.30
	H L	-1.6136*	0.21	0.00	-2.0279-	-1.1993-
H L	H H	-1.7050*	0.16	0.00	-2.0186-	-1.3914-
	L (ATT) L (CSE)	1.5889*	0.20	0.00	1.19	1.99
	L H	1.6136*	0.21	0.00	1.20	2.03
H H	H H	-.0914-	0.20	0.64	-.4812-	0.30
	L (ATT) L (CSE)	1.6803*	0.15	0.00	1.39	1.97
	L H	1.7050*	0.16	0.00	1.39	2.02
	H L	0.09	0.20	0.64	-.2984-	0.48

Based on observed means.

The error term is Mean Square(Error) = .636/ The mean difference is significant at the .05 level.

Results in table 42 display all the hypotheses of the dissertation with their results.

**Table 42**

Hypotheses	Hypotheses Results
H1: At t2, students in the experimental group are expected to develop higher CRID, CSE, attitudes, desires, and intentions in comparison to t1	Rejected
H2A: students in the experimental group are expected to develop higher CRIDs, CSEs, attitudes, desires, and intentions in comparison to students in the control group, controlling for their initial levels.	Partially Supported
Hypothesis 2B: At (t2/post), perceptions of formal learning (FL) and creative learning (CL) are expected to have a positive impact on intentions (INT) among students in the experimental group.	Partially Supported
Hypothesis 3: SVPCB is positively related to CRID	Supported
Hypothesis 4: CRID is positively related to entrepreneurial intentions (EIs).	Not Supported
Hypothesis 5: CRID is positively related to CSE	Supported

Hypothesis 6: CSE is positively related to desires.	Supported
Hypothesis 7: Attitudes toward entrepreneurship are positively related to desires.	Supported
Hypothesis 8: Attitudes toward entrepreneurship are positively related to entrepreneurial intentions (EIs).	Supported
<b>Table 42 (Continued)</b>	
Hypothesis 9: Desires are positively related to entrepreneurship intentions (EIs).	Supported
Hypothesis 10: CSE is positively related to entrepreneurial intentions (EIs).	Not Supported
Hypothesis 11A: FL is positively related to attitudes	Supported
Hypothesis 11B: FL is positively related to CRID	Not Supported
Hypothesis 11C: FL is positively related to CSE	Not Supported
Hypothesis 11D: FL is positively related to EIs	Not Supported
Hypothesis 12A: CL is positively related to attitudes	Not Supported
Hypothesis 12B: CL is positively related to CRID	Not Supported
Hypothesis 12C: CL is positively related to CSE	Supported
Hypothesis 12D: CL is positively related to EIs	Not Supported
Hypothesis 13 (H13): The interaction between attitudes toward entrepreneurship and CSE will result in four distinct	No Interaction effects. However, there are significant differences in the means of at least two profiles

<p>profiles: high attitudes x high CSE (high/high condition); high attitudes x low CSE (high/low condition); low attitudes and high CSE (low/high condition); and low attitudes and low CSE (low/low condition).</p>	
<p><i>Hypothesis 13a: High attitudes and High CSE will result in the highest EIs/INT.</i>  <i>Hypothesis 13b: High attitudes and low CSE will result in the third highest EIs/INT.</i>  <i>Hypothesis 13c: Low attitudes and high CSE will result in the second highest EIs/INT.</i>  <i>Hypothesis 13d: low attitudes and low CSE will result in the lowest EIs/INT.</i></p>	<p>-Supported. Highest  Not Supported. Second Highest.  However, there are no significant differences in the means between H13a and H 13b  Not supported. Lowest. However, there are no significant differences in the means between H13c and H 13d  Not supported. Third highest. However, there are no significant differences in the means between H13c and H 13d</p>

### 4.3 Chapter Summary

Chapter 4 started with an overview of the sample results and descriptive statistics conducted on the whole sample of students participating in the study as well as the repeated sample of students who filled in the survey at t1 and t2. Then, the results of validity and reliability tests as well as the model fit summary were displayed. The chapter concluded with the hypotheses results.

## CHAPTER 5: DISCUSSION

### 5.1 Discussion of Goals (Revisiting Goals)

This study has two major goals. The first objective is examining the impact of entrepreneurship education courses on the students' desires and intentions toward entrepreneurship and the proposed factors that influence those effects, specifically creative role identities (CRIDs), creative self-efficacy (CSEs), and attitudes (ATTs) to provide a better understanding of the effect of entrepreneurship education. Also, two course related benefits were examined, perceptions of formal learning (FL) and creativity learning (CL). The second objective is providing a more developed version of the TPB to better theorize the process by including novel constructs that have not been examined before in the literature within this context. These constructs are entrepreneurial desires, SVPCB, CRID, and CSE. Based on the strong ties between entrepreneurship and creativity, SVPCB, CRID and CSE are posited to work with attitudes to influence implementation desires and entrepreneurial intention. Despite the novelty of using these three constructs within this context, their constructs' validity has been evidenced in prior research. To address the second objective of the study, I also developed a unique 2\*2 model which captures the interaction effects between attitudes towards entrepreneurship and CSE on entrepreneurial intentions. I proposed that the combination of attitudes and CSE will result in four profiles of EIs. Outcomes of four unique profiles were examined: (high attitudes, high CSE); (high attitudes, low CSE); (low attitudes, high CSE); (low attitudes, low CSE). The four profiles suggests a typology of nascent entrepreneurs: the "natural" entrepreneur characterized by high

attitudes x high CSE (high/high condition); the ‘accidental’ entrepreneur characterized by high CSE x low attitudes (high/low condition); the ‘inevitable’ entrepreneur characterized by low CSE x high attitudes (low/high condition); and the ‘abstainer’ or non-entrepreneur characterized by low CSE and low attitudes (low/low condition).

## **5.2 Discussion of H1-H2B Outcomes and Contribution**

H1 is considered validated if significant differences in the means are observed between the initial measures of intention and its proposed antecedents (ATTs, CRIDs, CSEs, desires) and those made following the completion of the courses. Considering the results of H1, it appears that for the experimental group of students who filled in the survey at t1 and t2, the EECs did not significantly affect their CRIDs, CSEs, desires, and intentions, despite the existence of some differences in the means values of those variables. It should be noted that small differences in the means do not imply that there is no change at all in these variables. The increase in means, even though insignificant, can possibly be related to the fact that students in the experimental group (treatment) have obtained perspectives on their creative dispositions as well as on what it takes to be an entrepreneur. Karimi et al. (2016) reported that the post-test value of EI increased compared with the pretest value, even though non-significant, among students attending entrepreneurship courses. Also, Yar Hamidi et al. (2008) reported that students engaged in academic entrepreneurship programs had higher intentions to start their own businesses in the future.

One interesting finding of H1 is the significant decrease in attitudes among students after taking the course. This finding does not necessarily indicate that the courses are ineffective. Oosterbeek et al. (2010) stated that the negative impact of

entrepreneurship programs on entrepreneurship related constructs can be related to the possibility that participants may not like the program or other factors, such as compulsory participation. The negative impact of EECs and entrepreneurship education programs on entrepreneurial related outcomes, such as attitudes toward entrepreneurship in my study, has been reported in prior research. For example, DeTienne and Chandler (2004) and Lucas and Cooper (2004) both reported that EE students had lower entrepreneurial intentions than comparison/control students as measured by their likelihood of getting involved in a start-up in the next 12 months. Oosterbeek et al. (2010) reported that a leading entrepreneurship education program did not have a significant impact on students' self-assessed entrepreneurial skills (and traits) and the effect on entrepreneurial intentions was significantly negative. They related the negative impact on intentions to the possibility of obtaining more realistic perspectives both on themselves as well as on what it takes to be an entrepreneur. Souitaris et al. (2007) and Karimi et al. (2016) reported that the entrepreneurship programs failed to develop students' attitudes. Even further, Karimi et al. (2016) stated that their study did not provide evidence that entrepreneurship education programs had a significant effect on students' EI in the sample as a whole. While my results (a decrease in attitudes among the experimental group of students) support results of some other studies (e.g., Oosterbeek et al., 2010), they contradict other research indicating a positive outcome of entrepreneurship education on relevant outcomes criteria (Peterman & Kennedy, 2003).

The lack of significant average positive impact, as per the results of H1, measured toward the end of the program can be explained by several factors. One of the factors is the shortness of the time (almost four months). When measuring the impact of an entrepreneurship education program on students' attitudes and intentions, Fayolle and

Gailly (2015) found out that entrepreneurship education program (EEP) did not seem to have an effect on antecedents of entrepreneurial intentions in the short term (right after the course). However, when they considered the impact of the EEP as measured six months after the completion of the program, they found on average a significant positive influence on attitudes and perceived behavioral control. However, they did not find a significant impact on entrepreneurial intention six months after the end of the EEP. Similarly, Cooper and Lucas (2004) used a longer term second post-test with longer follow up periods. Another possible factor explaining the insignificant influence could be related to high initial levels of students' attitudes, desires, and intentions which did not provide or allow for the course to significantly influence the examined outcomes. Fayolle and Gailly (2015) showed that the impact of an entrepreneurship education program on entrepreneurial intention and its antecedents was strongly influenced by the students' initial level of intention and prior exposure to entrepreneurship. The entrepreneurship education program examined in their study increased the levels of intention of students who initially did not embark on an entrepreneurial career and decreased that of students who initially had one in mind.

Looking at the results of H1 separately imply that the EEC courses can be judged unsuccessful due to the non-significant difference in the values of the study variables (CRIDs, CSEs, desires, and EI/INT) as well as the decrease in attitudes among the experimental group before and after the course. However, the results of H2A show that there are significant differences in the study variables, CRID, desire, and EIs/INT when conducting one-way ANCOVA at time 2, with group membership (experimental vs. control) as the independent variable and taking the initial time 1 values of these variables as covariates. Although one-group studies help in hypothesis building, their

results are not sufficiently rigorous in drawing the causal relationship between EE and positive outcomes toward entrepreneurship. Having a control group, possessing comparable characteristics to the treatment group, addresses one of the methodological limitations of entrepreneurship studies which lack control groups (Peterman & Kennedy, 2003) and adds to the internal validity of results (Souitaris et al., 2007). Also, taking into account, when testing H2A, the effect of the prior level of attitudes, CRID, CSE, desires, and intentions by including them as control variables allowed me to demonstrate empirically the impact of the entrepreneurship courses on the development of entrepreneurial intentions and its determinants among the experimental group versus the control group. Therefore, findings of H2A suggest that universities can develop students' EI.

The results of H2A are complemented with the results of H2B which indicate that perceptions of formal learning have a significant influence on intentions toward entrepreneurship. The results H2B bring a significant contribution to the EE literature since they reveal the effect of specific benefits for the students derived from the entrepreneurship courses. In particular, they provide empirical support for the idea that formal academic courses can have a positive impact on students' intentions to initiate an entrepreneurial venture. Zhao et al. (2005) found that among the determinants of entrepreneurial self-efficacy, perceptions of formal learning had the largest effect. Also, Karimi et al. (2016) reported that opportunity identification perception, a basic component of formal learning, was significantly related to intentions. Contrary to my expectations, perceptions of creativity learning (CL) supported in the courses do not prove to significantly influence intentions (EIs/INT) as well as the other study variables, except for CSE. There are several explanations of the lack of the influence of

perceptions of CL on EIs in my study. One possible explanation is the inclusion of variety of entrepreneurship education courses in my study which have different objectives and focus. Although most of the courses selected for this research combine some forms of creativity training and formal entrepreneurship teachings, the emphasis of the courses on creativity versus formal learning is probably different across the various courses. These variances possibly have affected the perceptions of students regarding creativity learning supported in their courses and consequently the influence of FL versus CL on entrepreneurial intentions (EIs). The lack of a relationship between perceptions of CL supported in the course and intentions partly aligns with the findings of Zampetakis et al. (2011) who reported that perceptions of creativity supported in the university had no effect on students' entrepreneurial intention. .

### **5.3 Discussion of H3-H12D (The Hypothetical Model) Outcomes and Contribution**

In addition to assessing the impact of EECs on students' desires and intentions toward entrepreneurship, another goal of this study is to further develop Ajzen's (1991) dominant model of TPB and to empirically test the new model in explaining students' intentions of entrepreneurial activities. The lack of motivational components in TPB and the entrepreneurial event model has been recently highlighted in the literature (Van Gelderen et al., 2015). Bird (2015) called for studies of entrepreneurial intentions that investigate growth intentions rather than just business formation. My SEM results (H9) highlight that intentions are significantly and directly influenced by desires, with desires having a stronger relation to intentions than attitudes at time two, .67 versus .53. Also, findings reveal that desires partially mediate the relationship between attitudes and intentions. This particular finding partly aligns with the findings of other scholars, such

as Bagozzi and Dholakia (2006) in addition to Perugini & Bagozzi (2001) who reported that intentions were indirectly impacted by attitudes through desires. They perceived attitudes towards a behavior in the TPB, or the 'perceived desirability' construct in the entrepreneurial event model as evaluative appraisals which should be accompanied by a desire to act in order to induce intentions. It also aligns with the findings of Schlaegel and Koenig (2014) who reported that the effect of attitude on EI is partially mediated by perceived desirability. Another important finding is that desires fully mediated the relationship between CSE and intentions, thus confirming the model of goal directed behavior (Perugini & Bagozzi, 2001) and suggesting that it is an individual's desire through which the other determinants are transformed into EI. Similarly, Shapero and Sokol (1982) suggested that more distal factors indirectly influenced EI through their effect on perceived desirability and perceived feasibility. Khuong and Huu An (2016) found that perceived feasibility (a construct similar to efficacy) indirectly influenced entrepreneurial intentions. The relationship between self-efficacy in general and desire is a logical one since the desire to do something is important but it needs the belief in the ability to do the behavior so that motivations are transformed into intentions (Elfving et al., 2009).

Overall, the above results show that the TPB determinants as well as creative self-efficacy particularly influence EI through desires. These findings afford us a good sense of students' psychosocial development and how to help them navigate transitions from desires to intentions. They make a contribution to the literature since desire, a motivational construct different from desirability, is a salient factor that is regularly ignored in contemporary theories of entrepreneurial intentions (Riquelme & Lanqawi, 2016). Some earlier studies that included the concept of perceived desirability and

propensity to act but failed to distinguish desirability as an attitude from desires as a motivation (Schlaegel & Koenig, 2014). In addition, these results indicate the possibility of intentions to evolve from one cognitive regime to another and go through different stages following a certain pattern (Krueger & Day, 2010).

Similar to Riquelme and Lanqawi (2016) who found that attitudes contributed directly and indirectly to intentions, my findings also support the direct relationship between attitudes and intentions (H8). Although I argued for the inclusion of desire in the TPB model as an essential motivational component, attitudes still can contribute directly to intention if “certain social psychological conditions are either co-present or forthcoming as accompanying instigators of intentions” (Bagozzi, 1992, p.184).

Schlaegel & Koenig (2014) reported that their integrated model of EI revealed that direct paths from ATT, subjective norm, entrepreneurial self-efficacy (ESE), and perceived behavioral control (PBC) to EI were all significant and positive and their direct effects on EI were stronger than their indirect, specifically the path from attitudes toward the behaviour to entrepreneurial intent via perceived desirability, as well as total effects. So, in their SEM results, they reported both direct and indirect effects of attitudes on EIs.

In addition to proposing desire as an essential construct in the TPB model, my suggested model shed light on the ignored link between creativity and entrepreneurial intentions (Hmieleski & Corbett, 2006) by including SVPCB, CSE, and CRID. While other variables discussed in the literature might be good indicators for why students will choose entrepreneurship as a career option, creativity can more specifically influence entrepreneurial behavior in terms of innovation, product development, marketing, etc. (Yar Hamidi et al., 2008). My results reveal that creative self-efficacy has a direct significant influence on students’ desires toward entrepreneurship and an indirect effect

on intentions (H6 and H10). My study therefore offers contributions to the literature on entrepreneurial intentions and entrepreneurship as a career choice. When people judge themselves, or appraise themselves as having the competence to perform creative activities, they are infused with the desire to start a business. To date, however, researchers have not examined the central theoretical role creative self-efficacy might play in explaining entrepreneurial desires and intentions. Although my results do not show a direct relationship between CSE and intentions, the findings reveal a significant direct path from CSE to entrepreneurial desires, thus encouraging future studies to employ CSE in other national contexts and across more widely representative samples. Other studies, employing other creativity constructs, reported direct relations between these creativity constructs and EIs. For example, Yar Hamidi et al. (2008) reported that the personal creativity score in their model had a strong and positive effect on entrepreneurial intentions as well as their overall model. However, they emphasized that their results should be seen as tentative, since they employed personality theories which measure stable broad personality constructs stable across various environments and are weak determinants of specific behavior (Wiklund & Shepherd, 2003). Also, Zampetakis et al. (2011) found that the more creative young people (individual creativity) consider themselves to be, the higher their entrepreneurial intentions. Their study examined a sample of business school students in one British university based in England, thus limiting the generalizability of their results. It should be noted that, to the best of my knowledge, that my study is the first one to examine the construct of creative self-efficacy within the TPB framework and the context of EE. As the body of research on this construct moves forward, I believe that the CSE construct may prove quite useful

for enhancing both the theoretical understanding and the practice of entrepreneurship in a multitude of settings.

Other forms of self-efficacy, specifically entrepreneurial self-efficacy, were positively related to students' intentions to start their own business in previous research (Chen et al., 1998). However, some recent research, such as the study conducted by Douglas (2013) found no evidence of a significant direct relationship between entrepreneurial self-efficacy and independence oriented intentions in his classification of entrepreneurial intentions into growth oriented intentions (GOI) and independence oriented intentions (IOIs). Following the logic of Douglas (2013) in explaining the lack of a direct significant relation between ESE and IOIs, the lack of a significant direct relation between CSE and EIs in my study may be possibly explained by the use of a generic measure of intentions. There has been substantial research into the antecedent causes of the formation of entrepreneurial intentions, but previous authors treated entrepreneurial intention as a single generic construct (Lee et al., 2011). "Depending on the ratio of growth oriented intentions(GOIs) to independence oriented intention (IOI) individuals in the researcher's sample, the sign for most of the independent variables might potentially switch from positive to negative, or vice versa, and these might be significant or not" (Douglas, 2013, p. 646). In my model, CSE requires the motivation component of desire to stimulate intentions. From this perspective, creative self-efficacy is more similar to a psychological characteristic (i.e., situationally specific motivation), as argued by Chen et al. (1998), rather than to an action-oriented construct.

As for the path from CRID to intentions (H4), my hypothesis in this regard is not supported. Looking at intentions as a proxy for creative behaviour (the act of entrepreneurship), this result can imply that the lack of a significant relationship between

perceptions of CL supported in the course in my study and CRID which may have influenced this result. Although CL does not contribute significantly to CRID, SVPCB seems to contribute significantly to CRID, explaining almost 58% of the variance in CRID (H3). The existence of a significant relation between SVPCB and CRID aligns with the findings of Farmer et al. (2003) which revealed that employees being creative in the past showed augmented senses of CRID, undermining the necessity of the supportive role of supervisors or managers. Also, my study results contribute to identity research by providing a test of role identity changes over time in a university setting. In addition, the results extend prior research (Farmer et al., 2003) by affirming that a creativity-specific role identity influences a corresponding sense of personal agency. Examination of the relationship between creative role identity and creative self-efficacy (H5) also permits some clarification on the potential nature of the relationship between these variables, an issue that has been cited as needing further attention (Shalley et al., 2004)

The results of the structural equation modeling in my research show a significant direct influence of perceptions of formal learning on attitudes (H11A) and indirect influence on intentions and desires. Therefore, my research illustrates that entrepreneurship courses are sources of fostering opportunity identification and competency which is fundamental in entrepreneurship education courses and programs (Shane & Venkataraman, 2000). Also, perceptions of CL (H12C) supported in the courses has a significant direct effect on CSE among the experimental group of students in my study. These results align with the findings of Gundry, Ofstein, & Kickul (2014) who reported that creativity skills acquired by students influenced their self-perceptions of creativity after completing an entrepreneurship course on creativity and innovation. Also, Amabile (1996) suggested that educational environments impact students'

creativity. The latter result supports the importance of mastery experiences in increasing self-efficacy, in agreement with Bandura (1992), further suggesting that perceptions of creativity learning may play a role in the development of creative self-efficacy.

In general, the main contribution of this section of my research lies in the empirical attempt to complement existing literature in the explanation of entrepreneurial intention within the context of EE by proposing new constructs to the TPB model.

#### **5.4 Discussion of H13-H13D (2\*2 Model) Outcomes and Contributions**

This research does not only suggest new constructs for developing the theory of planned behavior, but also examines the interaction effect of attitudes and CSE on the formation of intentions among the experimental (EXP) and control (CTRL) samples of students who filled in the survey at t1 and t2. Shedding the light on various levels of intentions may not only help in coming up with a typology of nascent entrepreneurs (Fitzsimmons & Douglas, 2011), but also helps in employing EE to move students across the various profiles, based on an understanding the intentions can evolve. Most previous studies (Krueger & Dickson, 1994) indicated that entrepreneurial intentions were formed when both perceived feasibility and perceived desirability are high. Previous studies in the EE field did not provide significant consideration to interaction effects among possible antecedents of EIs (Fitzsimmons & Douglas, 2011). Contrary to the results reported by Fitzsimmons and Douglas (2011), I did not find evidence of an interaction effect between attitudes toward entrepreneurship and CSE (non-significant interaction) in determining entrepreneurial intentions. On the contrary, attitudes played the dominant role in determining entrepreneurial intentions. The result of the insignificant interaction between attitudes and CSE in the formation of entrepreneurial

intentions seems to complement the SEM results regarding a lack of a significant direct relationship between CSE and intentions in my model. In testing this hypothesis, I considered factors linked to prior entrepreneurial exposure such as belonging to a family of entrepreneurs, gender, or taking part in a prior entrepreneurship training program or a course. In particular, Krueger (1993) reported that these various types of exposure to entrepreneurship may have positive or negative consequences on entrepreneurial intention and behavior.

Despite the lack of an interaction effect, the results of the last group of hypotheses (H13) emphasize the importance of attitudes as the main predictor of entrepreneurial intentions. These results seem to align with results of some previous studies. Many previous studies emphasized the power of attitudes in predicting intentions. For example, Izquierdo and Buelens (2011) reported that their second model, in which attitudes mediated the impact of entrepreneurial self-efficacy on intentions, provided a stronger explanatory power in predicting their entrepreneurial intentions than their first model. Their first model is grounded in TPB deriving from the model initially proposed by Bird (1988) and later developed by Boyd and Vozikis (1994). The model examined a direct effect of attitudes on entrepreneurial intentions, unlike their second model which examined the mediating role of attitudes in the relationship between entrepreneurial self-efficacy and intentions. Robinson et al. (1991) depended solely on attitudes toward entrepreneurship in their description of entrepreneurship emphasizing that attitude was an effective approach to the description of entrepreneurs. They emphasized that the advantage of using an attitudinal approach was that it could be more domain-specific, thus increasing the correlation with actual behavior and reduces unexplained variability. Other scholars, such as Ferreira et al. (2012) reported that while

personal attitudes were among the strongest factors directly affecting entrepreneurial intentions, perceived behavioral control did not have a significant direct impact on intentions. In a similar fashion, Wu and Wu (2008) found out that personal attitude was the main predictor of behavioral intentions to found a startup, irrespective of students' educational background.

Despite the non-significant interaction effect between attitudes toward entrepreneurship and CSE in my study, the cross classification of attitudes and CSE resulted in significant differences in the mean scores of entrepreneurial intentions of two resulting profiles which are H (ATT) H (CSE) and H (ATT) L (CSE) on one side and L (ATT) L (CSE) and L (ATT) H (CSE) on the other side, indicating that there can be differences in intentions levels, contradicting the assumption that the existence of entrepreneurial intentions is a simple binary proposition.

## **5.5 Overall Contribution and Theoretical Implications**

The core theoretical contributions of my thesis are to the research streams of planned behaviour and entrepreneurship education. The study provides further supporting evidence for the application of the TPB in predicting and understanding EI in different contexts. Moreover, this study contributes to the TPB by examining the effect of entrepreneurship education as an exogenous influence on EI and its antecedents, and it shows that the TPB can provide a useful framework to evaluate the effectiveness of entrepreneurship education courses. In addition, my research develops the TPB model by specifically incorporating CSE and desires. I suggested new variables, SVPCB, CRID, CSE, and DES. Examining these variables, in addition to attitudes, addresses a major gap in the literature regarding impact measures affecting the

development of the entrepreneurial mindset, defined as cognitive phenomena deeper than intentions (Lackéus & Middleton, 2015). Understanding entrepreneurial cognition is imperative to understanding the essence of entrepreneurship: how it emerges and how it evolves. It is also important to note that creative self-efficacy has been cited in the creativity literature as a construct that warrants further research investigation (Shalley et al., 2004). This pioneering empirical study which consolidates these variables into a single model (see Figure 8) explains 85% per cent of the variance in entrepreneurial intention and 64% of the variation in entrepreneurial desires (see table 37A). According to Liñán and Chen (2009), these results are highly satisfactory. The study findings (SEM results and the 2\*2 model) confirm the attitude-intention link, thus contributing to TPB. These findings are in line with some earlier studies on the relationship between attitudes and intentions but nevertheless the study suggests other significant findings, not presented in prior studies. The SEM results reveal a significant positive relation between CSE and entrepreneurial desires on one side and entrepreneurial desires and intentions on the other side, thus suggesting that these two constructs should be considered and examined further in theoretical models of entrepreneurial intention. These results also add to the broader literature on self-efficacy as they illustrate how creative self-efficacy may be a useful influence in the entrepreneurship area. CSE influences entrepreneurial desire which is the strongest factor impacting entrepreneurial intentions at t2. Also, the findings initiate and encourage future research to examine determinants of specific self-efficacy forms relevant in entrepreneurship and entrepreneurship education.

My study attempted to address the methodological limitations in the field contributing to the contradicting results of the impact of EE. Nabi et al. (2017)

emphasized in their comprehensive article review of 159 published articles from 2004-2016 that 68% of the articles used cross sectional methodology, with only few articles which employed a longitudinal design and/or a control group. Similarly, Rideout and Gray (2013) stated that the two main designs used in almost all the studies reviewed were one-group pretest–posttest (no control group used) and posttest-only with nonequivalent comparison group, as opposed to true quasi-experimental. I adopted a sophisticated research design of a pretest posttest control group design to achieve more robust results. I also used the same variables at pretest and posttest, except for the demographic variables which I used only at the pretest. Other studies, such as the one conducted by Zhao et al. (2005), used different variables at posttest from pretest. Zhao et al. (2005) surveyed students at the beginning and at the end of their two-year MBA programs to examine whether the variety of EE experiences obtained by the students had an impact on entrepreneurial self-efficacy and ultimately entrepreneurial intentions.

As for the statistical analysis, I used a variety of tools to ensure statistical conclusion validity. Considering the complexity of entrepreneurial intention, it may be deemed more appropriate to use structural equation modelling. Most of the studies drawing on the TPB framework used regression analysis techniques which did not permit for a complete examination of model measures in the explanation of behavioral intention and is limited to using the only direct measures (do Paço et al., 2011). SEM has several advantages in comparison to other statistical tools when assessing the outcomes of entrepreneurship education courses on entrepreneurial intention and its proposed antecedents. First, SEM does not only effectively evaluate a pattern among a set of hypothetical constructs, but also evaluate other observed ones which can be measured by one or more indicators (Hoyle & Smith, 1994). Second, the SEM, different from other

regression statistical tools, is not constrained to using only direct measures which is more comprehensive in evaluating the conceptual model.

Finally, the courses examined in this study were heterogeneous EE courses selected from three different universities. Looking at different courses offered at more than one school provides external validity. However, it would be easier to detect the effects when the researcher deals with homogenous programs or courses which incorporate the same teaching components and deal with homogenous groups of participants (Fayolle & Gailly, 2015). Several studies with the objective of evaluating the impact of entrepreneurship education examined several courses from different universities e.g. (Karimi et al., 2016; Zhao et al., 2005). Also, dealing with multiple courses can provide future research opportunities to compare between the impact of different courses in terms of teaching approaches, contents, pedagogies, objectives, and modes of selection (compulsory versus elective) on capturing changes in entrepreneurial attitudes and intentions. These are research gaps that have been identified by several scholars in the field (e.g. Zhao et al., 2005).

## **5.6 Practical Implications**

In terms of practice, the study provides valuable information and insights for the delivery and evaluation of entrepreneurship education courses aimed at increasing entrepreneurial desires and intentions of students. As for researchers, the findings indicate that there are significant differences in the means of CRID, desires, and intentions between the experimental and the control group when controlling for the initial levels of these variables. These results imply that substantial progress in the field can be achieved by utilizing a quasi-experimental design with pretest and posttest

controls and a control group. Martin et al. (2013) concluded that entrepreneurship education researchers must include pre- and post-entrepreneurship interventions. Researchers should address methodological limitations in previous studies which could be the cause of the inconsistent results of EE outcomes (von Graevenitz et al., 2010).

As for educators, entrepreneurship education can play a significant role in developing students' creative self-efficacy. SEM findings strongly suggest that CL is directly related to students' CSEs. Therefore, educators should focus more on the use of appropriate teaching methods which emphasize creativity in order to enhance students' CSE more effectively. Creativity should occupy a more central role in business education, particularly entrepreneurship (Dewett & Gruys, 2007). As students are exposed to and practice creativity skills, they become more effective in generating new ideas (Amabile, 1996). Several scholars argue that teaching creativity skills in the classroom can enhance opportunity identification competency as well by combining activities associated with creativity such as divergent thinking and idea generation exercises) and experiential activities (Smith-Nelson et al., 2011).

Strengthening students' confidence to become creative through the mechanisms known to affect self-efficacy beliefs and mastery experiences appears to have an important impact on entrepreneurial desires. Although I did not examine the exact features of the entrepreneurship courses since this is beyond the scope of the current study, the SEM findings, showing the significant direct relation between CSE and desires, suggest greater attention to the design features in entrepreneurial education courses which should incorporate many diverse types of learning experiences as well as mechanisms fostering sense of efficacy, entrepreneurial attitudes, and desires. The majority of entrepreneurship courses in general place more emphasis on the exploitation

and identification of opportunities and devote less time on training students in idea generation and creating new business opportunities (Neck & Greene, 2011). As Heinonen and Poikkijoki (2006, p.8) pointed out, “The budding entrepreneur needs not only knowledge (science), but also new ways of thinking, new kinds of skills and new modes of behaviour (arts).” Therefore, enhancing this competency should be a particularly important component of entrepreneurship education and a fundamental design principle in EECs.

This does not necessarily undermine the importance of formal education since the results of my research show that perception of formal learning influences EIs and are directly related to attitudes towards entrepreneurship. My findings provide empirical support for the idea that formal academic courses can have a positive impact on students’ intentions to start their own ventures. Also, the SEM analysis shows a significant direct relationship between formal learning, one of the courses derived benefits, and attitudes, thus emphasizing the importance of embedding concepts, such as opportunity recognition and evaluation in our entrepreneurship classrooms. Therefore, entrepreneurship courses should equip students with tools which assist them to find opportunities and make opportunities (Neck & Greene, 2011). Formal education can provide examples of the lifestyles and working styles of successful entrepreneurs which can assist students in developing their own psychological coping strategies to maintain motivation (Stumpf et al., 1991). These learning opportunities are likely to be tailored to provide positive outcomes that individuals will attribute to their own ability, effort, and performance strategies. Such attributions should lead to increased self-efficacy for entrepreneurial tasks

My findings strongly suggest that attitudes are central to starting a business, thus aligning with findings of other scholars who confirmed the importance of attitudes in explaining entrepreneurial behaviour (Souitaris et al., 2007). In terms of practice, this finding provides valuable information and insights for those who formulate, deliver, and evaluate educational programs aimed at increasing the EI. A practical application is that an attitude change should be an important objective of entrepreneurship education. More attention should be given to the cognitions of entrepreneurs, including perceptions, attitudes, beliefs, and intentions, rather than merely focusing on the technical aspects (Chen et al., 1998) .

The findings also show a significant positive relationship between desires and intentions. In this regard, the findings may benefit investors, educators, and entrepreneurs by providing an explanation of how entrepreneurial intentions become energized. Practitioners may also be interested in understanding how entrepreneurial desire is formed. The desire for entrepreneurship can be initiated by making individuals think about the positive aspects of starting a business. Desires may also be unjustifiable if they are not accompanied by the perception of some forms of efficacy, such as CSE in my study. The variables in my study account for almost 65% of the variance in entrepreneurial desires.

### **5.7 Study Limitations**

There are some limitations in this research that I recommend be addressed in future studies. The first limitation of the study was the relatively short period of time between the two phases t1/PRE and t2/POST (around 4 months) which might not have allowed for the impact of the entrepreneurship education course on the examined

dependent variables to be fully captured in addition to the lack of a second follow-up posttest assessment. Shadish, Cook, and Campbell, (2002) emphasized that a second follow-up posttest assessment at six months was a significant design strength ensuring internal validity. Since tracking participants from the experimental group beyond the time frame of the academic semester was not part of the research design, I had to work with this relatively short time frame. Considering the results of Fayolle and Gailly (2015), it seemed that for the whole sample, the EEP affected the students' perceived behavioral control and attitudes toward entrepreneurial behavior in the medium time frame (six months after the completion of the program) in comparison to no significant influence in the immediate time frame (directly after course completion). However, there were other entrepreneurship studies which employed a longer time frame of almost 12 months and still did not report a significant influence of the course on entrepreneurial related outcomes. For example, Oosterbeek et al. (2010) did not find the entrepreneurship education program at one of the schools to cause the intended effects when they tracked the responses over a one year time period.

The second limitation was the use of self-report measures which could be subject to reliability and validity issues due to common method variance (CMV). However, I adopted several procedural and statistical techniques to minimize the potential effects of common method variance on the outcomes. Although all the scales I used in my study have been validated in the literature and widely employed by other scholars, I re-examined their validity and reliability at both t1 and t2, going through several filtering processes.

Third, students were not randomly allocated to the entrepreneurship education course and the control courses. This was due to two main factors. First, there was the

difficulty of randomly assigning students to certain courses in educational research (Souitaris et al., 2007). Second, I preferred a study in a naturalistic academic setting that would not bias the results. I compensated for the non-random allocation with before-after designs with control groups, which offered a good level of internal validity.

The fourth limitation of my thesis refers to the observation that students in the experimental group, in comparison to the control group, were more likely to have taken other EEC courses, more likely to have owned or managed their own business, and slightly more likely to have parents who started their own business. This may have created a ceiling effect which explains why there is a little, non-significant, change in EI as well the other primary study variables, when conducting the paired sample t-tests, as intentions have already been set prior to taking the courses under study. Another limitation in regard to the control group was that fact that the group came from one university, University of New Brunswick, while the experimental group came from multiple universities.

## **5.8 Implications for Future Research**

The current study proposes several future research opportunities. First, future research should focus on the intention-behavior relationship as well since the gap between intentions and entrepreneurial behavior can be large as individuals may not volitionally pursue their EIs in practice (Elfving et al., 2017). Therefore, a promising research avenue is to focus on university alumni and nascent entrepreneurs who have shown some initiatives toward starting their own business in order to improve the external validity of the study (Esfandiar et al., 2019). In my study, entrepreneurial intention was used as a proxy for actual behavior construct, based on groups of

university students. Which is well justified in my study for many reasons. The link between behavioral intention and subsequent behavior is well established in theory and supported by extensive empirical research (Ajzen, 1991). Using intention and its antecedents has gained much attention in the entrepreneurship literature due to their usefulness in predicting entrepreneurial behaviour (Fayolle & Gailly, 2015). Moreover, the selection of university students is critical to assess the pre-post- test impact of the examined entrepreneurship education courses. However, findings also suggest that there is a scarcity of research focusing on the transition from intention to behaviour, nascent or start up activities (Nabi et al., 2017). Souitaris et al. (2007) examined the relationship between EE and nascency after and EE program, However, they did not find a significant positive relationship, thus suggesting a need for further research. It is valuable to explore who becomes or succeeds as an entrepreneur. Also, employing longitudinal methods may address the challenge of the causality of self-efficacy. Markman, Baron, and Balkin (2005) mentioned that one obvious limitation of their study was uncertainty regarding causality of self-efficacy in terms of whether establishing a company increased one's self-efficacy or whether high self-efficacy led one to start a new firm.

The current study assessed the effects of participating in the EEC on several variables, viewed as antecedents of desires and intentions toward entrepreneurship. A second promising future research opportunity is to go deeper to examine the specific characteristics, design elements, contents, and teaching approaches of entrepreneurship education courses and programs, with an emphasis on the most influential elements of the course impacting variables of interest. For example, one possible line of inquiry would be studying the impact of divergence and convergence specifically, deemed

central to the entrepreneurship process, on the development of CSE, CRID, entrepreneurial attitudes and intentions among students attending entrepreneurship courses. This is because different pedagogical approaches and teaching methods play a crucial role in promoting students' creative thinking and behavior (Gundry et al., 2014) which can in turn stimulate and strengthen their attitudes and intentions toward entrepreneurship. In relation to this, future research might also assess whether different learning environments would have different effects on the outcomes

A third recommendation for future research is to incorporate a second source of qualitative data to gain deeper and more detailed insights from a student's perspective. Although self-report surveys are the most common tools employed for data collection in the literature, incorporating qualitative data approaches for data collection would certainly be helpful in complementing the quantitative data results.

Another call for future research is to address possible interaction effects between possible antecedents of entrepreneurial intentions. Although the results of my proposed 2\*2 model were not really significant, I may consider them at this stage tentative for several reasons. CSE is a new construct that has not been used before within the context of TPB. So, it may be valuable to repeat the application of the 2\*2 model among a different group of participants in different contexts. Actually, additional research on the creative dispositions among entrepreneurship students is necessary. Preferably, such investigations should consider the wide range of measures in creativity assessments (Amabile, 1996). Courses included in my sample focused on both the support of formal and creative learning. A future line of research can investigate the model among a sample of students who are attending entrepreneurship courses, with a sole focus on creativity development.

## 5.9 Concluding Remarks

This thesis provides the first empirical examination of FL, CL, CRID, CSE, attitudes, entrepreneurial desires, and intentions within the context of TPB and EE. The theory aims at providing a more developed version of the TPB by examining entrepreneurial desires and creativity related constructs that have not been studied within this context before and by investigating the interaction effect of attitudes and CSE. The thesis responds to the call of Martin et al. (2013) to conduct pre-post-test quasi-experimental designs to evaluate the impact of EE. My thesis builds upon the early pioneering studies in the entrepreneurship area, EE, and creativity studies. It has important practical implications in terms of the influence of FL on intentions and its significant relationship with attitudes in addition to the direct path between CL and CSE. Also, the pioneering result that CSE influences entrepreneurial desires which in turn strongly influence entrepreneurial intentions. Future research should examine CSE among different samples and in different contexts. A future line of inquiry can also consider the relationship between self-views of past creative behaviour and intentions. In addition, my 2\*2 model proposed a taxonomy of nascent entrepreneurs as natural entrepreneurs, accidental entrepreneurs, and inevitable entrepreneurs. Although my results were not statistically significant, future research should explore potential interaction effects between different variables or in different contexts.

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## **APPENDIX A**

### **Letter of Invitation to Instructors**

**(sent via email to instructors)**

Dear Professor

My name is Maha Tantawy. I am a PhD A.B.D candidate in the Interdisciplinary Graduate Studies Program at the University of New Brunswick (UNB), Fredericton, Canada. My thesis aims at tracking changes in entrepreneurial cognition among university students taking a university level course in entrepreneurial studies. The results of this study are expected to contribute to a better understanding of some of the candidates / dimensions of the entrepreneurship mindset. I am looking to collect data from students enrolled in entrepreneurship courses at universities in Canada for my PhD thesis in Fall 2018 semester. As you are teaching a university-level class on entrepreneurship, I would appreciate if you assist me in my research and grant me permission to collect data from students attending your classes for my PhD thesis. I respectfully ask that you assist me in any ONE OF THE FOLLOWING three ways.

1. Distribute to the students in your entrepreneurship course, via your course listserv, the invitation to students attached to this email. Please do so near the beginning of the course, so that students can complete the online survey as near the beginning of term as possible. I will also ask them to complete the survey again at the end of the term. I will be sending them a reminder email toward the end of the course in November to fill in the survey one more time Please, encourage your students to go online and finish the survey. Their participation will broaden scholarly understanding of the effectiveness of entrepreneurship courses.
2. Agree to allow me to visit your classes personally on two occasions, in September toward the beginning of the course and in November toward the end of the course, and administer the questionnaire in a paper-and-pencil format. We can arrange exact times and places later if you prefer this option. Administering the survey to your class will take no more than 15 minutes.
3. Administer the paper-pencil survey to your class, yourself, on my behalf. If you prefer this option, I will mail you the questionnaire with a return envelope twice, one in September toward the beginning of the course and another time in November toward the end of the course. I will pay for all postage charges.

This project has been reviewed by the Research Ethics Board of the University of New Brunswick and is on file as REB 2018-069

Thanks in advance for your cooperation. In case of your agreement to assist me in this project, please reply to this email [maha.tantawy@unb.ca](mailto:maha.tantawy@unb.ca) indicating which of the three options for cooperating with me and my project you would like to choose. Also, additional information about the project or the survey can be found in the attached Letter

of Invitation to Students. Upon request, I will send both you and your students a summary of the results of the project when it is completed.

## **APPENDIX B**

### **Letter of Information and Consent to Students**

**School of Graduate Studies  
The University of New Brunswick  
Fredericton, NB, Canada**

This research survey is being conducted by me, MahaTantawy, a Ph.D student in the Interdisciplinary Graduate Studies Program at the University of New Brunswick in Fredericton, N.B., Canada. The title of my project is “Am I an Entrepreneur? Diving Deep to Know”. This version of the survey is being conducted in class, either by me or by the course instructor acting on my behalf

You are being asked to complete this survey because you are currently taking a university-level course in entrepreneurship. The purpose of my study is to gather information about some of the outcomes of your current course in regard to entrepreneurship and creativity. I am so excited to know about your attitudes toward entrepreneurship as well as your experience in starting a business. I am so interested in your views!!

Participation is easy- just read the following information about the study, and then, if you choose to participate and consent to have your data used, complete and submit the survey either to me or to your instructor in class. It should take you about 10-15 minutes to fill out. We will be administering the survey to you twice, once at the beginning of your entrepreneurship course, and once toward the end of the course, so that I can measure any changes in your attitudes and views.

To ensure we gain valuable learning from this survey, it is important that we get high response rates, so please do participate!!

If you have questions about this study you may contact the primary researcher by emailing [maha.tantawy@unb.ca](mailto:maha.tantawy@unb.ca).

#### **Participant Information and Consent**

This is part of a PhD study led by a PhD candidate at the University of New Brunswick: Maha Tantawy, [maha.tantawy@unb.ca](mailto:maha.tantawy@unb.ca)

#### **Procedures Involved in the Research:**

It should take about 10-15 minutes of your time to complete this survey. I would like you to complete the survey during the first month of your current entrepreneurship class (September), and then complete it again toward the end of the course (end of November, early December). If you do not wish to answer specific questions in the questionnaire then you may simply leave them blank.

The survey questions include a few demographic items, plus questions about your

attitudes toward entrepreneurship and your views about starting your own business. I will also ask you if you are interested in participating later in an online focus group next February or March. Those who express interest, and are chosen to participate in the focus group will be receiving a \$25 Master card. You can, of course, complete the online survey without participating later in the focus group.

Details regarding the focus group will be sent in a separate letter to those who express interest and are selected.

### **Potential Harms, Risks or Discomforts**

There are no serious risks associated with participation in this study.

### **Potential Benefits and Results**

Your participation will contribute to the study of entrepreneurship education and entrepreneurial thinking. You may receive the initial results of this study via email upon request by emailing maha.tantawy@unb.ca. I expect the initial results to be available in the spring of 2019. Also, if you chosen to participate in the focus group, you will be compensated with a \$25 Mastercard.

### **Confidentiality**

Your participation in this research is confidential. The survey does not require you to give your name or other identifying information, except your email address for possible contact about the focus group. The data collected will be held by Maha Tantawy, PhD candidate, in the strictest of confidence. In addition to me, Maha Tantawy, my PhD supervising committee will have access to the raw data. Remember that if your instructor is administering the questionnaire, he or she may have the opportunity to see the answers you have given, but you are not obligated to answer any question that you do not want to answer and your name will not appear on the questionnaire booklet.” Only averaged responses will be published in my dissertation, and presented at academic conferences and in academic journals. I expect to collect data from about 150-200 participants and results will be reported in the aggregate only.

### **Participation and Withdrawal**

Your participation in this study is voluntary. If you decide to be part of the study you can decide to withdraw at any time. In cases of withdrawal, any data you have already provided will be used unless you indicate otherwise. You can skip any questions you wish and still submit the results. You may decline to participate in this study at any point in time without any penalty.

### **Ethics Approval and Consent**

This project has been reviewed by the Research Ethics Board of the University of New Brunswick and is on file as REB 2018-016. If you have questions about this study you may contact Dr. Steve Turner, chair of UNBF Research Ethics Board, at [turner@unb.ca](mailto:turner@unb.ca), tel: 506-458-7433.

By completing the questionnaire which follows and submitting it, you are giving informed consent for me to use the information you provide for the purposes of my research, under the terms described above.

Thank you for participating!

## APPENDIX C

### About You

1. What is your email address that you frequently use?
2. What is your age (in years)?
3. What is your gender? check any that apply  
(1 = male, 2 = female, 3 =prefer not to answer)
4. What is the name of your university?
5. What is your degree program/major?
6. Are you a graduate or undergraduate? (circle one item)  
(1= a graduate, 2=Undergraduate)
7. If you are an undergraduate, what is your year of study?
8. Are you taking the course as an elective or mandatory? circle one item  
(1=elective, 2= mandatory)
9. What is the title of your course?
10. Have you attended an entrepreneurship course prior to this current course? Circle either Yes or No (Yes or No)
9. Do you have any experience owning/managing your own business? Circle either Yes or No (Yes or No) If yes, has the experience been positive? (Yes or No)
11. If yes to above, please indicate how long you worked for yourself in the past.(Please type it out in full )
12. Did your parents ever start a company/business? Circle either Yes or No (Yes or No)  
If yes, has the experience been positive? (Yes or No)

13. Do you know anyone else who had started a business? Circle either Yes or No (Yes or No) If yes, has the experience been positive? (Yes or No)

14. Would you like to have a copy of the complete results sent to you by email? Circle either Yes or No (Yes or No)

15. If you complete the survey now and one more time at the end of the course, would you like to participate in the focus group in return for a \$25 gift card? Circle either Yes or No (Yes or No)

## APPENDIX D

### SURVEY QUESTIONS

**Using the scale below, please Indicate your level of agreement with the following sentences from**

**1=Strongly Disagree**

**2=Disagree**

**3= Neither Agree Nor Disagree**

**4= Agree**

**5= Strongly Agree**

1. Being an entrepreneur implies more advantages than disadvantages to me-----

2. A career as an entrepreneur is attractive for me \_ \_ \_ \_ \_

3. If I had the opportunity and resources, I'd like to start a firm/business \_ \_ \_ \_ \_

4. Being an entrepreneur in the future would bring great satisfactions for me \_ \_ \_ \_ \_

5. Among various career options, I would rather be an entrepreneur \_ \_ \_ \_ \_

**Using the scale below, please indicate the extent to which the following factors are important for your decision about your future career plans rating from**

**1=Strongly Disagree**

**2=Disagree**

**3= Neither Agree Nor Disagree**

**4= Agree**

**5= Strongly Agree**

1. Not having long working hours-----

2. Having fixed working hours-----

3. Not having a stressful job-----
4. Independence at work-----
5. To be my own boss-----
6. To be able to choose my own work tasks-----
7. To create something-----
8. To fulfill my creative needs-----

**Using the scale below, please Indicate your level of agreement with the following sentences from**

**1=Strongly Disagree**

**2=Disagree**

**3= Not Sure**

**4= Agree**

**5= Strongly Agree**

1. I am ready to do anything to be an entrepreneur\_ \_ \_ \_ \_
2. My professional goal is to become an entrepreneur \_ \_ \_ \_ \_
3. I will make every effort to start and run my own firm/business \_ \_ \_ \_ \_
4. I am determined to create a firm in the future \_ \_ \_ \_ \_
5. I have very seriously thought of starting my own firm/business\_ \_ \_ \_ \_
6. I have the strong intention to start a firm/business one day \_ \_ \_ \_ \_
7. I am ready to do anything to develop a nontraditional idea\_ \_ \_ \_ \_
8. My professional goal is to become a highly creative entrepreneur \_ \_ \_ \_ \_
9. I will make every effort to start and run my own highly innovative firm/business \_ \_ \_
10. I am determined to create a highly innovative firm/business \_ \_ \_ \_ \_
11. I have very seriously thought of starting my innovative firm/business \_ \_ \_ \_ \_

12. I have the strong intention to start a nontraditional firm/business in the future \_ \_ \_

**Using the scale below, please indicate the best response that best indicates how**

**likely-unlikely you will start your own company:**

**1=Highly Unlikely**

**2=Unlikely**

**3= Neutral**

**4= Likely**

**5= Highly Likely**

1. I will start my own company-----

2. The likelihood that I will be involved in the creation of a new venture sometime—

In the next 12 months-----

In the next 5 years-----

In the next 10 years-----

Sometimes in my lifetime-----

**Please express your overall desire to start your own business**

1. My desire to start my own company can be expressed as

- no desire at all
- no desire
- Neutral
- A strong desire
- A very strong desire

2. I want to start my own company

- Strongly Disagree

- Disagree
- Not Sure
- Agree
- Strongly Agree

3. I feel an urge or need to start my own business

- Does not describe me at all
- Does not describe me
- Neutral
- Describes me
- Describes me very well

4. My overall wish to start my own business can be summarized as

- No wish at all
- No Wish
- Neutral
- A very Strong wish
- A strong wish

**Using the scale below, please indicate your level of agreement with the following sentences**

**1=Strongly Disagree**

**2=Disagree**

**3= Not Sure**

**4= Agree**

**5= Strongly Agree**

1. I feel that I am good at generating new ideas-----
2. I have confidence in my ability to solve problems creatively-----
3. I have a knack for further developing the ideas of others-----.

**Using the scale below, to what extent do you agree with the following statements regarding your entrepreneurial capacity?**

**1=Strongly Disagree**

**2=Disagree**

**3= Not Sure**

**4= Agree**

**5= Strongly Agree**

1. To start a firm and keep it working would be easy for me \_ \_ \_ \_ \_
2. I am prepared to start a viable firm \_ \_ \_ \_ \_
3. I can control the creation process of a new firm \_ \_ \_ \_ \_
4. I know the necessary practical details to start a firm \_ \_ \_ \_ \_
5. I know how to develop an entrepreneurial project \_ \_ \_ \_ \_
6. If I tried to start a firm, I would have a high probability of succeeding

**Using the scale below, Indicate your level of agreement with the following sentences**

**1=Strongly Disagree**

**2=Disagree**

**3= Not Sure**

**4= Agree**

**5= Strongly Agree**

1. In this specific course, I learn that there is more than one solution to a problem-----
2. In this specific course, I learn to examine existing problems in new ways-----

3. In this specific course, I am encouraged to produce new and useful ideas-----

**Using the scale below, please indicate how much you have learnt during the course regarding**

**1=Very Little**

**2=Little**

**3= Somewhat**

**4= Quite a bit**

**5= A great deal**

1. opportunity recognition-----

2. opportunity evaluation-----

3. starting a business-----

4. corporate entrepreneurship-----

**Using the scale below, please indicate your level of agreement with the following sentences**

**1=Strongly Disagree**

**2=Disagree**

**3= Not Sure**

**4= Agree**

**5= Strongly Agree**

1. My university is very supportive of creative work-----

2. I feel creativity is supported and encouraged at my university-----

3. My university fosters new ideas or concepts-----

4. My university Culture values creative work-----

5. I can freely do creative or innovative work at my university-----

6. New ideas are encouraged at my university-----

**Using the scale below, please indicate that If you decided to create a firm, would people in your close environment approve of that decision?**

**1=Strongly Disapprove**

**2=Disapprove**

**3= Not Sure**

**4= Approve**

**5= Strongly Approve**

1. Your close family -----

2. Your friends -----

3. Your colleagues -----

**Using the scale below, please indicate with what frequency you engage in the behaviors listed below.**

**1=Never**

**2= Rarely**

**3=Sometimes**

**4=Often**

**5=Always**

1. I spend considerable time trying to understand the nature of the problem-----.

2. I think about the problem from multiple viewpoints-----.

3. I decompose a difficult problem into parts to obtain greater understanding-----.

4. I consult a wide variety of information when solving a problem-----.

5. I search for information from multiple sources in order to solve the problem-----.
6. I spend considerable time looking for relevant information when solving a problem---
7. I engage in generating original solutions for problems-----.
8. I consider diverse sources of information in generating new ideas-----.
9. I generate number of alternatives to the same problem before I choose the final solution.
10. I devise potential solutions that move away from established ways of doing things---
11. I engage in making my instructors enthusiastic for innovative ideas-----.
12. I acquire approvals from my instructors for innovative ideas-----.
13. I work towards transforming innovative ideas into useful applications-----.
14. I mobilize support for innovative ideas-----.

**Using the scale below, please indicate the best response that best indicates how interested you are in engaging in entrepreneurial activities**

**1=Very Little**

**2=Little**

**3= Somewhat**

**4= Quite a bit**

**5= A great deal**

1. I am interested in engaging in starting a business
2. I am interested in acquiring a small business
3. I am interested in starting and building a high-growth business
4. I am interested in acquiring and building a company into a high-growth business

**Using the scale below, Please indicate the extent to which you agree with each of the following statements (circle one number for each item)**

**1=Strongly Disagree**

**2=Disagree**

**3= Not Sure**

**4= Agree**

**5= Strongly Agree**

1. I am strong enough to overcome life's struggles-----

2. At root, I am a weak person-----

3. I can handle the situations that life brings-----

4. I'm usually an unsuccessful person-----

5. I often feel that there is nothing I can do well-----

6. I feel competent to deal effectively with the real world-----

7. I often think that I'm a failure-----

8. I usually feel I can handle the typical problems that come up in life-----

**Using the scale below, please indicate how often you could be described as a person**

**who:**

**1=Never**

**2=Very Rarely**

**3= Occasionally**

**4= Very Frequently**

**5= Always**

1. Always thinks of other ways to solve problems when you run into obstacles-----.

2. Would sooner create something than improve it-----.

3. Has fresh perspectives on existing problems-----.

4. Prefers changes to occur gradually-----.

5. Copes with several new ideas and problems at the same time-----.
6. Helps other people develop new ideas-----.
7. Has lots of new ideas-----.
8. Needs the stimulation of frequent change-----

**Using the scale below, please, indicate your level of agreement with the following sentences:**

**1=Strongly Disagree**

**2=Disagree**

**3= Not Sure**

**4= Agree**

**5= Strongly Agree**

1. I often think about being creative-----.
2. I do not have any clear concept of myself as a creative entrepreneur-----
3. To be a creative entrepreneur is an important part of my identity-----.

**Thank You For Participating**

**When you are finished, please return the questionnaire booklet to the person  
administering the survey**

## APPENDIX E

### LIST OF COURSES

This list provides an overview of the courses included in this study with a brief description of each course

<b>EXP/CTRL</b>	<b>Course Title</b>	<b>Course Description</b>
EXP	Technological Creativity & Innovation/ New Venture Creation and Entrepreneurship TME 3413/ MBA 6114	Covers the process of generating ideas, recognizing opportunities, and shaping them into venture plans. Teams approximately three students generate venture ideas, evaluate the feasibility, pitch the merits, and create a business plan that they defend in a contest
EXP	Product Design & Development TME 6025	This course is a full-year Product Design and Development course which forms the core of the Master of Engineering in Technology Management & Entrepreneurship Program
EXP	Entrepreneurship & Innovation 7200	This course includes an overview of innovation and its value for a firm, entrepreneurial thinking as an approach to general management, how the innovation process works, creating entrepreneurial companies, organizing and managing innovation within existing firms, the role of technology, and coping with the strategic challenges facing all innovators. The course utilizes real-world learning techniques such as

		case studies, guest speakers, and projects.
EXP	Creativity, Innovation, & Value Creation TME 2001	Introduction to the roles of creativity, value creation and entrepreneurship in the innovation process. Students will learn about idea generation, ways to enhance individual and group creativity, value creation and entrepreneurship in its various forms.
EXP	Venture Startup & Entrepreneurship ADM 4175	This is a course for those who have an interest in pursuing an opportunity, shaping it into a venture plan, and potentially launching it as a viable business in the future.
EXP	Entrepreneurship & New Ventures BUS 3710	This course studies the theoretical nature and practical of entrepreneurship and new venture creation. The course focuses on the processes in opportunity recognition, idea generation, and planning. Students will gain a greater understanding of differing entrepreneur and venture types better situate their new ventures in the market
EXP	Innovation Process & Management MTEI 5530	The course combines theory about innovation management, including business models for innovation, with an introduction to some of the tools used for innovation management.
EXP	Entrepreneurship Theories & Concepts MGMT 4494	Through lectures and seminars, course covers the nature of entrepreneurship, characteristic behaviours of

		entrepreneurs, the entrepreneur as catalyst for economic activity, application of the concepts of entrepreneurship to public and non-profit enterprises.
CTRL	Strategic Management MBA 6107	Examines the role of the strategic management process in the performance of the modern businesses. Topics include: business and mission definition dynamics of industrial rivalry, development of competitive advantages, and determinants of success or failure for alternate types of competitive strategies.
CTRL	Strategic Management ADM 4143	Examines the process of strategy formation for the business as an integrated organization. Emphasizes the problems of defining organizational mission, analyzing the dynamics of competitive rivalry, and the determinants of success or failure for alternate types of business strategies based upon a thorough company/industry analysis.
CTRL	Corporate Finance ADM 3415	Examines portfolio theory and valuation capital, capital expenditure decisions, long-term financing decisions, cost of capital, financial structure dividend policy, and external expansion.
CTRL	Advanced Financial Accounting ADM 4215	Examines the accounting and financial reporting for inter-corporate investments

		and business combinations, including the preparation of consolidated financial statements for parent and subsidiary entities. Also covers segmented reporting.
CTRL	Training and Development ADM 4815	Examines fundamentals of training and development function in organizations. Appraises cycle from needs assessment to evaluation and explores the influence of changes in the workplace and the availability of information technology.
CTRL	Introduction to Sports and Leisure Psychology KIN 2032	Provides an introduction into the psychological influence of sport, physical activity, and leisure on the individual. Current social psychological theory about sport, physical activity and leisure behaviour will be examined through a wide variety of sport, leisure, and exercise psychology topics.

# CURRICULUM VITAE

Name: Maha Mohamed Tantawy

## EDUCATION

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- Ph.D. (In Progress) University of New Brunswick, Fredericton, New Brunswick, Canada  
School of Graduate Studies,  
Field: Entrepreneurship and Innovation/creativity.
- TESL Crandall University, New Brunswick, Canada, 2014
- MBA Heriot Watt University, Edinburgh Business School, Ireland, UK,  
2008
- B.A. The American University in Cairo, School of Business, 2000  
*AACSB International accredits the AUC School of Business*  
Bachelor of Arts with High Honors with a concentration in Marketing  
and a minor in Economics

## PUBLICATIONS

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### Peer-Reviewed Journal Articles

- McNally, J.J., Piperopolous, P., Welsh, D.H.B., Mengel, T., **Tantawy, M.**, & Papageorgiadis, N. N. (2019). From pedagogy to andragogy: Assessing social entrepreneurship syllabi on the Millennial learner. *Journal of Small Business Management*, 1-22
- Mengel, T. & **Tantawy, M.** (2018, July). Taking Social Entrepreneurship Education to the Next Level: A Teaching and Learning Project at Renaissance College. *CELT*, 11, 22-41
- Mengel, T., **Tantawy, M.**, & McNally, J.J. (2016, April). Social entrepreneurship education in Canada: Passion and practice. *Workplace Review*, 1, 55-70.
- Impact Rating: Not listed

### Books, Chapters, Case Notes & Edited Volumes

- Mengel, T., **Tantawy, M.**, & McNally, J.J. (2018). Social entrepreneurship education in Canada. In B. Sharma & M. Wielemaker (Eds.), *Aspects of Entrepreneurship: Passion and practice*. England: Cambridge Scholars Publishing Ltd

Mengel, T., **Tantawy, M.**, & McNally, J.J. (2016). Social entrepreneurship education in Canada. In B. Sharma & M. Wielemaker (Eds.), *Entrepreneurship: Passion and practice*. Fredericton, NB: University of New Brunswick Press.

### **Published Proceedings**

Mengel, T., **Tantawy, M.**, & McNally, J.J. (2015). Social entrepreneurship education in Canada: Passion and practice. In Patrick Bruning (Ed.), *Proceedings of the Forty-Fifth Annual Conference of the Atlantic Schools of Business*.

### **PROFESSIONAL PRESENTATIONS**

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#### **Conferences (Peer-Reviewed)**

McNally, J.J., & **Tantawy, M.** (2018, July). What is the Entrepreneurship Mindset and Should We Teach it? QIC presented at the RMLE Unconference, Scotland

**Tantawy, M.** (2018, May). Can we Teach 'Growth' mindsets in our Entrepreneurship Courses and Programs? presented at the annual meeting of the Canadian Council for Small Business & Entrepreneurship (CCSBE), Halifax, Nova-scotia.

McNally, J.J., Mengel, T., Welsh, D.H.B., **Tantawy, M.**, Piperopolous, P., & Papageorgiadis (2017, November). *Assessing changes in and impact of social entrepreneurship course syllabi on attitude formation*. Paper accepted for presentation at the annual meeting of the Research in Entrepreneurship & Small Business (RENT), Lund, Sweden.

McNally, J.J., & **Tantawy, M.** (2017, October). *Building evidence-based social entrepreneurship course outlines for adult learners*. Professional development workshop (PDW) presented at the annual meeting of the Global Consortium of Entrepreneurship Centres, Halifax, Nova Scotia, Canada.

**Tantawy, M.**, McNally, J.J., Mengel, T., Welsh, D.H.B., & Piperopolous, P. (2017, June). *Social entrepreneurship education on a global scale: Where do we stand and what lies ahead?* Paper presented at the annual meeting of the Administrative Sciences Association of Canada, Montreal, PQ.

Mengel, T., **Tantawy, M.**, & McNally, J.J. (2015, September). *Social entrepreneurship in Canada: Passion and practice*. Paper presented at the annual meeting of the Atlantic Schools of Business, Fredericton, New Brunswick.