

Usefulness of Practice-Based Pedagogical Approaches for Nascent Student Entrepreneurs

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Abstract

This article focuses on the impact of an entrepreneurship education program on nascent student entrepreneurs. It is based on the implementation of the French-language program “Étudiant-entrepreneur... Oui, c’est possible” (Student-entrepreneur... Yes, it’s possible) in different faculties at the Hassan I University in Morocco. The study used a pretest-posttest research design with 32 participants trained in the program and 30 participants in the control group. The results show that the program significantly improved knowledge, skills, or competencies about starting a business, entrepreneurial self-efficacy (ESE), and entrepreneurial behavior (marginally), but not entrepreneurial attitudes and intentions. Under the assumption that strong attitudes and intentions are prerequisites for becoming nascent entrepreneurs, the present results suggest that specific content training coupled with pedagogical approaches adapted based on progress in the entrepreneurial process benefits those with insufficient knowledge and ESE as they work to develop their entrepreneurial ideas.

Keywords

entrepreneurship education, pedagogical approach, entrepreneurial learning, entrepreneurial self-efficacy, entrepreneurial knowledge

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Introduction

Entrepreneurship is a career with ups and downs, and the prospect of failure is quite high due to inherent uncertainty (Fisher et al., 2020; York & Venkataraman, 2010). Engaging in this career often involves acquiring useful knowledge, developing positive attitudes and having high confidence in one's entrepreneurial skills (Fayolle & Gailly, 2015; Liguori et al., 2020; Piperopoulos & Dimov, 2015). In this context, universities have introduced entrepreneurship education into their curricula (Kuratko, 2005). Despite several systematic reviews documenting researchers' growing interest in observing the effects of entrepreneurship education (e.g., Gabrielsson et al., 2020; Galvão et al., 2018; Schuhmacher & Thieu, 2022), knowledge on this topic remains scarce. As Nabi et al. (2017) point out, a problem arises on at least three levels. First, the wide variety of courses, programs, and contexts makes it difficult to compare the studies carried out from one time to another (Kuratko & Morris, 2018). Most studies look at the effect of taking one or more courses in entrepreneurship, but not specifically special programs designed to support nascent (or established) student entrepreneurs. The pedagogical approach also varies greatly, with a particular attraction towards active approaches and experiential pedagogies (Hägg & Gabrielsson, 2019).

Secondly, most studies have focused on developed countries, with only 10% coming from Africa (Nabi et al., 2017). Therefore, it is difficult to know whether the effect of these courses is similar in developing countries where unemployment rates of graduates are higher, the opportunities and the economic context are different, and the entrepreneurial culture is less developed, or at least different (Bae et al., 2014). Such is the case in Morocco, which, since the enactment of law 01/00 on reforms to higher education in 2000¹, has introduced entrepreneurship education in the programs of several universities (Bellache, 2018), inspired by experiential entrepreneurship pedagogies, often more widespread in the West. However, Moroccans are less familiar with this type of pedagogy in their school curriculum (Chafi et al., 2016). In addition, the effect of entrepreneurship education on entrepreneurial intention or commitment to an entrepreneurial career may be less pronounced in Morocco, similar to other countries where the culture of uncertainty avoidance is strong (Bae et al., 2014). Thus, it is far from evident that copying what works in Western countries will hold in other parts of the world, undermining the generalizability of our theories.

Finally, the student cohorts taking courses or programs can sometimes be very heterogeneous (Sá & Holt, 2019). Many studies target students already interested in entrepreneurship at the beginning of the course to see its impact on many cognitive or affective indicators related to entrepreneurial careers. However, some students have no interest in entrepreneurship (e.g., when the training is mandatory), while others have a solid entrepreneurial intention before taking the course. Some may have begun the business creation process or even have previous experience in entrepreneurship (Samwel Mwasalwiba, 2010; Nabi et al., 2017; Sá & Holt, 2019). It is difficult to know the differentiated effect of a course or program according to these different profiles at

the beginning of the course or even according to the nature of the cohort (with homogeneous or heterogeneous profiles).

One of the problems with the accumulation of evidence about entrepreneurship education is that it does not consider the stage of the entrepreneurial process that students are at. Indeed, an introductory entrepreneurship course will have a different effect on a student wondering whether entrepreneurship might be a good career choice for him or her than on another student already firmly committed to that career choice and trying to start a business. Their needs will differ, requiring different content, pedagogical approaches, and impact indicators. Consequently, we propose a theoretical framework that suggests appropriate impact indicators of entrepreneurship education according to the stage of progress in the entrepreneurial process. We suggest categorizing three audience targets in entrepreneurship education: potential, nascent, and established entrepreneurs. In this study, we focused explicitly on nascent student entrepreneurs.

This research aims to take advantage of the unique opportunity of implementing a training program entitled “*Étudiant-entrepreneur... Oui, c’est possible*” (Student-entrepreneur... Yes, it’s possible), which mobilizes an active and experiential pedagogy for nascent entrepreneurs studying at one of the major universities in Morocco. We examine the specific impact of this program on critical outcomes identified in the entrepreneurship education literature through experimental research. Specifically, we use half of a randomly selected cohort of 62 student nascent entrepreneurs (the other being the control group) to observe the impact of the program on improving entrepreneurial knowledge, skills, and competencies, entrepreneurial attitude, entrepreneurial self-efficacy (ESE), entrepreneurial intention, and entrepreneurial behavior. Our results show that this program significantly improves entrepreneurial knowledge, ESE, and entrepreneurial behavior, consistent with our theoretical framework.

This research contributes to demonstrating the relevance of specialized programs aimed at students with real entrepreneurial projects who are already involved in the business creation process (nascent entrepreneurship), and it does so by highlighting a circumscribed effect on knowledge (including skills and competencies), self-efficacy, and behavior. We demonstrate that the impact indicators of entrepreneurship education programs must be linked to the target audience (potential, nascent, or established entrepreneurs) and that the pedagogies and training activities must also be aligned with them to enable participating students to progress to business creation. Secondly, this research contributes by investigating the role of training for nascent student entrepreneurs in entrepreneurial action. Our results show that the program allows students to progress in their projects, which is different for the control group. This illustrates the importance of further investigating the role of entrepreneurship education in bridging the gap between intention and behavior and encouraging the development of action-oriented training for nascent entrepreneurs. Finally, this research illustrates the impact of introducing these programs at universities of Morocco. Previous studies show that there are very few studies on entrepreneurship education in developing countries, especially in Africa (Martin et al., 2013; Martínez-Gregorio et al., 2021; Nabi et al.,

2017), and even fewer studies on nascent student entrepreneurs. A meta-analysis shows that a lack of tolerance for uncertainty and cultural differences in gender equality may reduce the impact of training in the Moroccan context (Bae et al., 2014). Given the high unemployment rate among university graduates, the public authorities want graduates to invest more heavily in entrepreneurial careers. The results show that programs such as the one introduced do not improve entrepreneurial attitudes or intentions, most likely because nascent student entrepreneurs already have solid attitudes and intentions when they enter the program due to the selection process. However, we provide evidence that it helps foster the knowledge, skills, competencies, and confidence needed to move forward (ESE) and it encourages these nascent student entrepreneurs to increase their behavior. This contributes to the generalization of our understanding of entrepreneurship support, primarily provided at universities through training.

Background and Literature Review

Morocco is a country that has one of the lowest rates of entrepreneurial activity among efficiency-driven economies (Global Entrepreneurship Monitor, 2022; Singer et al., 2018). Educated youth are the least involved in entrepreneurial activities, and most of the newly created businesses are in the low-tech sectors with intense competition (El Ouazzani, 2018). At the same time, unemployment among young university graduates is the highest among these economies at 61.2%.² In a context where these educated graduates do not find their place in the job market and are not immediately interested in entrepreneurship, the Moroccan government ensures that universities encourage students to consider entrepreneurial careers.

In 2000, the Moroccan government reorganized the higher education system through Law 01/00, allowing the Moroccan university to redefine its mission and integrate entrepreneurship into its system by introducing the entrepreneurial spirit³ and encouraging the creation of university incubators.⁴ Since then, universities have introduced changes to promote entrepreneurship among their student cohorts and better support business creation. Initiatives inspire many new programs developed specifically for this purpose in Western countries (see Boubker et al., 2021 for an example), despite the many differences in the entrepreneurial culture, the economy, the institutions, the law, and even the entrepreneurial ecosystem. This is the case for the program studied in this research, which was heavily inspired by the SALEEM project⁵ based on the best practices observed in Belgium, Romania, and France to support student entrepreneurship. It has not been sufficiently researched whether programs designed to support entrepreneurship (or entrepreneurs) in Western countries will have a similar effect when implemented in a developing country such as Morocco.

The same logic applies to pedagogical approaches in contexts other than Western countries. Studies show that in Morocco, teachers identify their functions mainly in terms of classroom control and knowledge transmission, with an emphasis on establishing their authoritative presence in class to elicit obedience and compliance from students (Chafi & Elkhouzai, 2017; Chafi et al., 2016). This contrasts with official

discourses on the institutionalization of learner-centered approaches in Morocco, which differs from what happens in classrooms in the United States, where learner-centered pedagogies have expanded over the years (Webber, 2012). Entrepreneurship education seems to yield better results when it takes place in active pedagogies where the learner is highly involved (Hägg & Gabrielsson, 2019; Hägg & Kurczewska, 2019).

Action-based teaching approaches are teaching methods that emphasize action, practice, experience, and reflection. As such, students are directly involved in activities or tasks related to their studies, and then they are asked to reflect on this experience to learn (Ahn, 2008; Kolb, 1984). More specifically, in entrepreneurship, using such pedagogical approaches consists of confronting students with the entrepreneurial reality during their learning (Fleck & Teckchandani, 2020; Pittz, 2014). Thus, they learn and practice entrepreneurship simultaneously (Arbaugh et al., 2021; Litzky et al., 2020). This is the case for the program focusing on this research, where active pedagogy is the common thread of the different activities prepared for nascent student entrepreneurs. However, most of these results were found in Western countries where students might perceive this perspective as more relevant. In countries such as Morocco, do active learner-centered entrepreneurship pedagogies engage students in an entrepreneurial career? There is no clear answer to this question.

Entrepreneurship Education and Training: For Whom and for What?

Supporting entrepreneurship and entrepreneurs through programs is complicated because entrepreneurship is a process that is not necessarily linear (Davidsson & Gruenhagen, 2021; McMullen & Dimov, 2013). The same is true in entrepreneurship education, where student entrepreneurs' needs differ from those who only vaguely consider this career (Morris et al., 2013). Three main stages of development lead to entrepreneurship as a career: potential entrepreneurs, nascent entrepreneurs, and established entrepreneurs (Gartner et al., 2004; Reynolds, 2000). Potential entrepreneurs are all individuals who are not in the process of starting a business or who are not entrepreneurs. These people have different degrees of intention to become entrepreneurs in the future. Their potential is latent and lies causally and temporally before intentions (Krueger, 2020; Krueger & Brazeal, 1994). Nascent entrepreneurs are attempting to start a business alone or in a team. They refer to the early stages of starting a new business venture. It is a term used to describe individuals who are in the process of creating a new business but have yet to launch it. Nascent entrepreneurs are important to entrepreneurship because they provide insight into the process by which individuals move from the intention of becoming an entrepreneur to the realization of owning an operational business. This implies engaging in entrepreneurial behaviors such as writing a business plan, creating a start-up team, resource gathering, and product/service development (McGee et al., 2009). The knowledge gap between entrepreneurial intention and behavior also needs to be more understood, which increases the importance of nascent entrepreneurship as a topic (Belchior & Lyons, 2021). Lastly,

established entrepreneurs have an operational business and are the owners (Curtin & Reynolds, 2009; Reynolds, 2006; Reynolds & Curtin, 2008). Many scholars consider this the final step of becoming an entrepreneur (Gartner, 1988; Gartner et al., 2004; Mitchell et al., 2002; Wennekers et al., 2005).

According to Ratinho et al. (2020), the difference between entrepreneurship education programs and entrepreneurial training programs depends on the intended goal: developing skills that can be applied in different contexts or training to support an imminent business start-up. Thus, as Dimov and Pistrui (2022) suggested, entrepreneurship education should be learning *for entrepreneurship* rather than learning *about entrepreneurship*. Many studies on entrepreneurship education and its effect on the entrepreneurial career process examine courses or programs primarily designed to teach about entrepreneurship and targeted at students with different entrepreneurial intention levels. Students who exhibit entrepreneurial behavior while trying to start a new business (i.e., nascent entrepreneurs) may find that programs designed to teach *about entrepreneurship* fall short of their needs. This situation may have led many previous studies to draw misleading conclusions about the impact of entrepreneurship education. The development of specific training for nascent student entrepreneurs is at the end of the spectrum of what is considered to be an educational program. In contrast, more engaged students in the entrepreneurial career would be considered as receiving training to support their business creation process (Ratinho et al., 2020). From a theoretical point of view, a training program intended for nascent student entrepreneurs will likely have a different effect on the process of career commitment than for others further advanced in this process.

To illustrate this point, we retrieved two meta-analyses (Martin et al., 2013; Martínez-Gregorio et al., 2021) and one systematic literature review (Nabi et al., 2017) on the effects of entrepreneurship education and examined the extent to which these studies considered both the various outcomes of entrepreneurship education and the level of progress in the entrepreneurial process of the students enrolled in the multiple studies collected. We also tracked the proportion of these studies that were conducted in developing countries or specifically in Africa. Table 1 shows that the outcomes mainly include constructs related to the Theory of Planned Behavior (Ajzen, 1991; Bird, 2015) and the Entrepreneurial Event Model (Shapero & Sokol, 1982), which are often used in combination (Krueger, 2000; Schlaegel & Koenig, 2014), namely entrepreneurial attitudes (or desirability), entrepreneurial self-efficacy (ESE) (or perceived feasibility), entrepreneurial intention and then entrepreneurial behavior. Two studies identify business creation as an outcome of training, corresponding to the transition from a nascent to an established entrepreneur, as discussed previously. Two other studies report the category of knowledge or skills (sometimes referred to as competencies) as part of the impact of entrepreneurship education, which is the only variable outside of the theories cited above. This is a natural outcome of education or training (Kraiger et al., 1993). In addition, we note that none of the compilations take into account the stage of the entrepreneurial process in which students are currently engaged during the research, and two of them specifically mention this aspect as being of high importance

Table 1. Outcomes of Entrepreneurship Education in Meta-Analyses and Systematic Literature Reviews.

Outcomes from entrepreneurship education	Martin et al. (2013) k = 42	Nabi et al. (2017) n = 159	Martinez-Gregorio et al. (2021) k = 23
Knowledge/Skills	17 (40.5%)	34 (21.4%)	n.a
Attitude (or desirability)	10 + 5(35.7%)	32 (20.1%)	8 + 5(56.5%)
ESE (or feasibility)	3 + 8(26.2%)	42 (26.4%)	7 + 5(52.2%)
Entrepreneurial intention	19 (45.2%)	81 (50.9%)	20 (86.9%)
Entrepreneurial behavior	1 (2.4%)	n.a	n.a
Business creation	6 (14.3%)	21 (13.2%)	n.a
Developing countries/ Africa	Developing: 7 (16.6%) Africa: 4 (9.5%) Country-specificity not considered	16 (10.1%)	Developing: 9 (39.1%) Africa: 2 (8.7%) No moderation observed
Entrepreneurial phase consideration	No	No, but suggested for future research	No, but suggested for future research

to be taken into account in future research. Finally, we can see that few of the studies compiled are in developing countries (between 10.1% and 39.1%), even fewer specifically in Africa (between 8.7% and 9.5%), and none in Morocco.

We also considered the systematic literature review on entrepreneurial support by [Ratinho et al. \(2020\)](#), which shows that where the work on entrepreneurship education ends, the work on training and support for (established) entrepreneurs begins. They show that most research looks at sources and types of entrepreneurial training in isolation from their context, biasing any outcome analysis. They mention who is being supported, for what type of activity, and under what conditions – these are critical factors in developing a comprehensive theory. Although nascent entrepreneurs within an educational setting are outside the scope of their manuscript, we have nevertheless considered these dimensions to clarify our contribution.

The Bae meta-analysis, not included in [Table 1](#), deserves a brief comment. First, it focuses exclusively on entrepreneurial intention, excluding all other outcomes identified in the studies reviewed. Second, it specifically reports on the effect of specific moderators, including the culture, to better understand the impact of entrepreneurship education on entrepreneurial intention. It should be noted that this study shows that the intention level before entering the experiments conditions the effect of education on intention. Specifically, individuals who enter with a high level of intention do not have a change in this intention after receiving entrepreneurship education. This suggests the moderating effect of moving from one stage of the entrepreneurial process to the next on the choice of indicators, on the one hand, and on the potential effect of expected outcomes, on the other hand. Furthermore, they found that cultures with high

uncertainty avoidance and low gender equality, as in Morocco, negatively moderate the effect of entrepreneurial education on entrepreneurial intention. In other words, their results show that countries such as Morocco are less likely to see changes in their students' entrepreneurial intentions after receiving entrepreneurial education.

Hypotheses Development

This research explicitly targets the nascent entrepreneurship stage since the training offered to students is intended for that audience. Indeed, the selected students were required to have an existing entrepreneurial project for which they were considering, or had already invested, efforts to establish the organization. This selection process is used to retain only nascent student entrepreneurs. It is done before the randomization to select the cases that will participate in the program (treatment group) and those who will not (control group). We consider here that as long as the business is not operational, the nascent entrepreneur is engaging in an entrepreneurial career. This process can be slowed down or abandoned based on any experience or learning throughout the process. This is consistent with the two implicit (or explicit) theories of the previous studies (i.e., Ajzen, 1991; Shapero & Sokol, 1982) on the impact of entrepreneurship education as well as with the recent developments in social-cognitive career theory (Lent et al., 2002) as it applies to entrepreneurship (e.g., Liguori et al., 2018; Marshall et al., 2019; Pérez-López et al., 2019; Segal et al., 2002). These theories converge to suggest that learning in different contexts, primarily through education or training, will improve knowledge, skills, and competencies (related to entrepreneurship), attitudes, and self-efficacy beliefs (also related to entrepreneurship), all of which will help develop the intention, or in this case, the entrepreneurial intention, and then ultimately the behaviors leading to this career, i.e., the entrepreneurial behavior. Given the short time frame of the post-training follow-up, we have excluded using an indicator of business creation, i.e., the change in the stage of the entrepreneurial process, because most participants do not have enough time to establish a new business.

Firstly, entrepreneurial knowledge, skills, and competencies should be expected to be gained through a specially designed program to support the business development of nascent student entrepreneurs with good business ideas. Entrepreneurial knowledge is based on the perspective of human capital theory (Becker, 1964), which suggests that it is the skills and knowledge individuals acquire through investments in schooling, on-the-job training, and other types of experience. We draw on the meta-analysis of Martin et al. (2013) on human capital formation in entrepreneurship, which defines entrepreneurial knowledge as the knowledge, skills, and competencies that are useful for starting and running a business, such as knowledge about entrepreneurship and entrepreneurial processes, the competency to identify an innovative business opportunity, or dealing with ambiguity in decision making. According to the taxonomy of Kraiger et al. (1993), entrepreneurial knowledge is essentially cognitive learning. Several studies have shown that action-based pedagogical approaches increase students' entrepreneurial knowledge and competencies (Gielnik et al., 2015; San Tan & Ng, 2006).

Although entrepreneurship education generally fosters knowledge acquisition, action-based pedagogical approaches enable students to retain this knowledge (Bell & Bell, 2016). This retention results from a better understanding they acquire by the practical nature of these instructional approaches (George, 2015). To improve their understanding, active pedagogical approaches get students to think about and apply what they have learned (Heinonen, 2007; Liang et al., 2016; San Tan & Ng, 2006). After the program, we expect the nascent student entrepreneurs to improve their entrepreneurial knowledge, skills, and competencies. Thus, we posit the following hypothesis:

H1: There is a positive significant effect of the program on participants' entrepreneurial knowledge.

Secondly, ESE refers to the self-perception related to performing entrepreneurship tasks (McGee et al., 2009; Trevelyan, 2011). This construct has been identified as an essential outcome of entrepreneurship education and training (St-Jean, Tremblay, Fonrouge, & Chouchane, 2022; Zhao et al., 2005). Self-efficacy is a dynamic construct (Gielnik et al., 2020; Peng et al., 2015) and, as such, can be modified over time based on four sources: mastery experiences, social learning, verbal persuasion, and physiological and emotional states (Bandura, 1997). In this context, active pedagogical approaches are most likely to develop ESE. Students who learn through these approaches value them because they believe they make them fit to be entrepreneurs (Jones et al., 2017). Mastery experiences generated through various pedagogical activities that closely mimic entrepreneurial tasks will likely increase ESE. In addition, students' perceptions of their ability to perform entrepreneurial tasks also increase (Gielnik et al., 2020). Furthermore, the educational programs are delivered in cohorts, allowing learners to compare themselves with others like them and adjust their ESE accordingly. In addition, the constant interaction with the instructors and various people from the entrepreneurial ecosystem who can support them means that verbal persuasion is more likely to occur, thereby increasing students' ESE. Cohort-delivered learning also allows participants to better regulate their emotions, especially in terms of managing the stress generated by the business creation (Arshi et al., 2021; Rauch et al., 2018; St-Jean, Tremblay, Barès, & Simionato, 2022; Wach et al., 2021). ESE has a powerful impact on entrepreneurial intention (Newman et al., 2019) and can still be increased during the attempt to start the business (Brändle et al., 2018; Drnovsek & Glas, 2002; Hechavarria et al., 2012; St-Jean, Tremblay, Fonrouge, & Chouchane, 2022). Furthermore, the Moroccan population has a lower sense of ESE than many other countries (El Ouazzani, 2018). Therefore, it is very likely that this particular program would increase students' ESE. Thus, we propose the following hypothesis:

H2: There is a positive significant effect of the program on participants' perception of their entrepreneurial self-efficacy (ESE).

Thirdly, educational programs can promote action and activate entrepreneurial behavior. This aspect needs more attention in entrepreneurship research (Meoli et al., 2020). Entrepreneurial behavior is the amount of effort, time, and money invested in

creating a business (Kautonen et al., 2013) or activities consistent with starting a business (Delanoë-gueguen & Fayolle, 2019). Entrepreneurship education positively affects entrepreneurial behavior (Rauch & Hulsink, 2015). In this research, students will likely take action to advance business creation, and as such, entrepreneurial behavior will be observed. This is particularly true for active-based pedagogies, as they require students to take actions that will lead to creating a business. In addition, this is likely to occur with Moroccan students, as entrepreneurial support from the existing ecosystem may not be as helpful as what is received through training. Thus, participation in the program is expected to lead to entrepreneurial actions. We posit the following hypothesis:

H3: There is a positive significant effect of the program on participants' display of their entrepreneurial behavior.

Two other components in our theoretical framework could be considered, but we set aside on the basis that they should remain the same following participation in the program. Firstly, the entrepreneurial attitude will likely remain the same following the program. Although several studies have suggested that entrepreneurial education improves positive attitudes toward entrepreneurship (Buli & Yesuf, 2015; Islam et al., 2018; Jones & Jones, 2014; Nabi et al., 2017; Yi & Duval-Couetil, 2018), the targeted students are those who may have a sufficiently positive level of entrepreneurial attitude to engage in such a program as they are already nascent entrepreneurs. As a result, they should already have a reasonably positive attitude towards entrepreneurship as they have prepared a project, presented it to the education program, and have shown a willingness to engage in the program to set up their organization. On the one hand, this attitude is high enough and cannot be improved by the training program, or even could decrease since it could help to know what entrepreneurship is about as a career. On the other hand, the entrepreneurial attitude being an aspect generally impacted by entrepreneurship education, it could be improved. What is new in this research is that the Moroccan context suggested that the population's attitudes about entrepreneurship are relatively low, especially for the students (El Ouazzani, 2018). Despite this, we do not expect a change in attitude, although we included this outcome in the research design to enhance the interpretability of the results.

Secondly, entrepreneurial intention is one of the most frequently used outcomes to assess the impacts of entrepreneurship education (Nabi et al., 2017). A multitude of studies have reported the effects of entrepreneurial education on intentions. Most of them report positive results (Aloulou, 2016; Buli & Yesuf, 2015; Fayolle et al., 2006; Islam et al., 2018; Mei et al., 2020; Samwel Mwasalwiba, 2010; Nabi et al., 2017; Souitaris et al., 2007). However, other studies suggest mixed, negative, non-significant or ambiguous results on entrepreneurial intentions (Lorz et al., 2013; Martin et al., 2013). For this study, the focus is on students who are nascent entrepreneurs. As such, they have already passed the intention stage, having undertaken the creation process. On the one hand, it is possible that the intention to engage in such a program is high enough and cannot be improved, as previously demonstrated in a meta-analysis (Bae

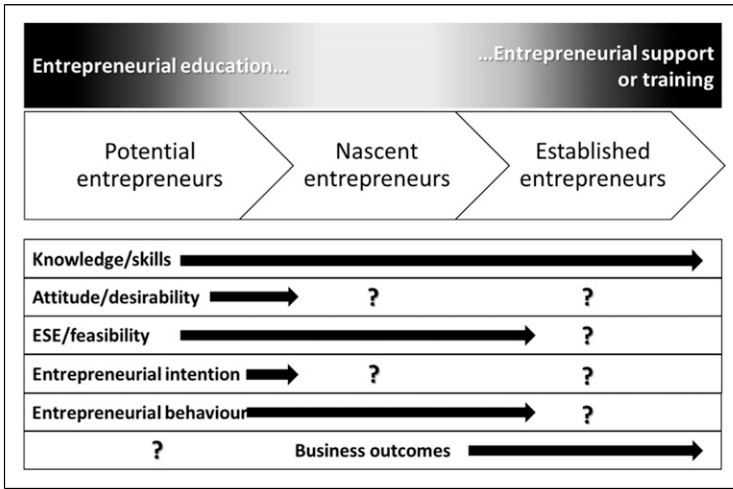


Figure 1. Entrepreneurial education and training outcomes as a function of the entrepreneurial process.

et al., 2014). On the other hand, it is also possible that this training is the springboard for these people to validate their entrepreneurial career interests. Considering the positive effect of entrepreneurship education on career intentions, it is then possible, but less likely, to observe an increase in entrepreneurial intention at the end of this training. Ferrandiz et al. (2018) found that these approaches positively improve intentions in the short term. Despite this, we do not expect a change in entrepreneurial intention, although we included this outcome in the research design. Thus, we propose the following hypotheses:

H4: There is no significant effect of the program on participants' attitude towards entrepreneurship.

H5: There is no significant effect of the program on participants' entrepreneurial intentions.

Based on the previous arguments, we propose a conceptual framework encompassing entrepreneurial education and training outcomes as a function of the entrepreneurial process (Figure 1). Specifically, as shown in Table 1, potential entrepreneurs are likely to benefit from entrepreneurial education and improve all the outcomes reported in the previous studies. However, nascent entrepreneurs should already have positive attitudes toward entrepreneurship and sufficient entrepreneurial intention to initiate entrepreneurial behaviors, leaving entrepreneurial knowledge, ESE, and entrepreneurial behaviors as the primary outcomes of entrepreneurial education. Finally, although beyond the scope of this manuscript, we should expect that the education of established entrepreneurs is more related to business outcomes, as shown in a recent systematic literature review (Ratinho et al., 2020) and in the recent experiments

conducted in developing countries (Bruhn & Zia, 2011; Chong & Velez, 2020; Dyer et al., 2016; Fiala, 2018; Huis et al., 2019; Valdivia, 2015).

Methodology

Description of the Training Program

The program entitled “*Étudiant-entrepreneur... Oui, c’est possible*” (Student-entrepreneur... Yes, it’s possible) was created for students of the *Université Hassan 1er* in Morocco. These students belong to seven faculties of this university, namely, the Faculty of Economics; the Faculty of Law; the National School of Business and Management; the Institute of Sports Sciences; the Higher Institute of Health Sciences; the School of Education; and the Faculty of Science and Technology. It is an elective program intended for students who want to become entrepreneurs. Often, these students already have a business idea and therefore have a certain degree of entrepreneurial intention. Some may have already started their entrepreneurial behavior by doing some activities to start a business.

The program consisted of delivering entrepreneurship training through a series of eight workshops (see Table 2). Entrepreneurship experts (entrepreneurs and entrepreneurship trainers) were mobilized to lead these different workshops. An action- and practice-based pedagogical approach was used. This included simulations, field research, data collection, and project-based learning. Each of the eight workshops covered a specific module (design thinking; Business Model Canvas; self-esteem; learning from failure; storytelling; sources of financing; business plans; and how to pitch). The practical aspect of these workshops was rooted in the learners applying the knowledge they acquired to their entrepreneurial projects. This meant that by the end of the program, each student would have an almost complete project. Participants take the training individually and work on their projects. Each project was presented to a committee in a pitch session. Each student used the Business Model Canvas they developed during the program and indicated which source of financing was most appropriate for their project. The presentations were followed by a question-and-answer session led by the commission members. At the end of the program, the students participated in a project pitch competition. Each student was allowed to use one of the pitch techniques they learned in the program to present their project. The top three projects received a bonus from the university’s president.

Research Design

This study used a pre- and post-experimental research design with a control group. This type of research design is considered one of the most powerful for establishing a causal relationship between variables (Highhouse, 2009; Williams et al., 2019). Participants in the program ($n = 62$) were randomly assigned to two groups, i.e., an experimental group and a control group (Fortin & Gagnon, 2016; Robson & McCarthan, 2016). The

Table 2. Themes Covered.

Module	Length, h	Contents	Pedagogical method
Design thinking	5		Conference Practical application
Business model canvas	10	Presentation of the 9 BMC blocks, where each student incorporates it into their project and presents it at the end of the workshop	Games, simulation, exercises
Self esteem	5	Presentation of the need for self esteem and how to conduct a personality assessment along with exercises to boost their self esteem	Presentations, simulation, exercises
Learning from failure	5	Explanation of the concept of failure and how to overcome it based on games (such as a guessing game on celebrities who had experienced failure before succeeding)	Games, conference
Storytelling	5	Students were asked to tell a story from their personal lives and relate it to the project	Conference, stories
Sources of financing	5	Presentation of the various sources of financing with the qualifying criteria for each source	Conference
Business plans	15	Explanation of the 3 BP studies. Students applied what they learned to their own BP and presented it at the end of the workshop	Practical application, oral presentation
How to pitch	5	How to organize the ideas acquired in the preceding modules to be able to talk about their project within a specific timeframe. Each student presented his or her project and the others shared their comments with a view to improving the project	Conference, presentation simulation

experimental group benefited from the program, while the control group did not. Due to limited space, the organizers explained that some were randomly selected to participate, and others could join in the program later. This is a delayed participation strategy. Data were collected from both groups before the program began and a month and a half after the program ended.

The selection process began with an awareness-raising campaign that aimed to recruit students. The campaign to recruit nascent student entrepreneurs to participate in the program attracted 252 students who wanted to enroll. After conducting individual interviews with them ($n = 124$) to learn more about their project and ensure they were

ready to start a business, 62 students were selected based on whether or not they already had at least one entrepreneurial idea. The reason for this is twofold. First, the program is designed to support students with a business idea by introducing them to activities to create their business. Second, homogeneity is needed to facilitate the course content and thus observe if this type of program helps students with their business creation. These 62 students were randomly divided into two groups. Students in the first group ($n = 32$) participated in the training program, and those in the second group ($n = 30$) did not. Thus, the students who completed the program formed the experimental group, and those who did not were the control group.

Sample

The total sample (experimental and control group combined) is composed of 33 male students and 29 female students. They are on average 22 years old (standard deviation = 1.85). A total of 74% of them have already carried out extracurricular activities in the field of entrepreneurship (e.g., participated in a club, attended a conference, etc.). As is often the case with student entrepreneurs, 65% have parents in business, and 40% have received general entrepreneurship training as part of their university program. Due to the selection process and the fact that nascent student entrepreneurs are not necessarily similar to the student population, the sample cannot be considered representative of the student population. However, it may represent the students who are interested in entrepreneurship, have at least developed an initial intention to become entrepreneurs, and are ready to start a business.

Measures

Knowledge. Knowledge refers to students' understanding level and ability to recall, interpret and apply the concepts they have learned during the program (Bloom et al., 1956; Krathwohl, 2002; Krathwohl et al., 1964). This variable was measured using the "level of knowledge" subscale of the entrepreneurial competencies scale recently used by Kozlinska et al. (2020), which is based on the Global University Entrepreneurial Spirit Students' Survey (GUESSS), a well-known study on entrepreneurial intentions of university students conducted in more than 35 countries (Sieger et al., 2014). The initial scale consists of five items, each containing a statement about the level of knowledge on specific topics related to entrepreneurship. Students were therefore asked to indicate to what extent each statement applied to them. The possible responses were presented on a five-point Likert scale ranging from (1) does not apply to (5) strongly applies. The list of items used is appended to this document (see Table 3). The reliability test on the five items (Cronbach's alpha = .862; composite reliability = .906) showed excellent internal consistency.

Attitudes. In this study, attitudes refer to the degree to which an individual has a favorable or unfavorable evaluation of entrepreneurship (Ajzen & Fishbein, 1980). As

Table 3. List of Scale and Items.

Construct	Items
Entrepreneurial knowledge	<ul style="list-style-type: none"> I know the key principles for presenting business ideas to potential investors I understand the process of granting loans in commercial banks I know the basic principles of team building and training I understand how business plans differ from business models I know what lateral thinking is
Entrepreneurial attitudes	<ul style="list-style-type: none"> Being an entrepreneur and having my own business is my true passion A career as an entrepreneur suits me well – it gives me more freedom and independence Out of the various options, I would prefer to be an entrepreneur
Entrepreneurial self-efficacy	<ul style="list-style-type: none"> I am able to attract the resources to implement a business idea I am able to identify and build management teams I can develop relationships with potential investors I can create a work environment that encourages people to do their best work I am able to motivate others to do what I want them to I am well equipped in terms of project management I am able to persuade potential customers to purchase a product or service I am an active networker I am able to convincingly communicate my ideas to others I have an overflowing imagination My intuition often helps me make the right decisions under conditions of uncertainty I am able to see a series of lucrative opportunities in everyday life I can learn from any life situation I am able to apply new ideas in real life

(continued)

Table 3. (continued)

Construct	Items
Entrepreneurial intentions	<p>I am ready to do everything to become an entrepreneur</p> <p>My professional goal is to become an entrepreneur</p> <p>I Will do everything to create and run my own business</p> <p>I am determined to create a business in the future</p> <p>I have very seriously thought about creating a business</p> <p>I have the firm intention of one day creating a business</p>
Entrepreneurial behavior	<p>Are you currently trying, alone or with others, to start a new business, including self-employment or selling goods or services to third parties?</p> <p>Even if you are not currently trying to create a business, it would be interesting to know whether you have undertaken any steps to start a business</p> <p>Spent a lot of time thinking about creating a business?</p> <p>Organized a start-up team?</p> <p>Defined market opportunities?</p> <p>Prepared a business plan?</p> <p>Chose a company name?</p> <p>Created a legal entity?</p> <p>Registered with tax authorities?</p> <p>Saved money to invest in a business?</p> <p>Invested your own money in a business?</p> <p>Applied for and received financial support?</p> <p>Searched for facilities and equipment?</p> <p>Purchased or leased important items, such as equipment, facilities or goods?</p> <p>Purchased raw materials, inventory or supplies?</p> <p>Developed models or procedures for a product/service?</p> <p>Initiated marketing or promotional activities?</p> <p>Devoted yourself full time to the business?</p> <p>Applied for licenses or patents?</p> <p>Hired employees?</p>

with the knowledge construct, attitudes were measured using a five-point Likert scale ranging from 1 = totally disagree to 5 = totally agree, which was adapted by Kozlinska et al. (2020) from the GUESSS study (Sieger et al., 2014). Students were asked to indicate their level of agreement with three statements. The reliability test on the three items (Cronbach's alpha = .816; composite reliability = .890) showed excellent internal consistency.

Entrepreneurial Self-Efficacy. Entrepreneurial self-efficacy was also measured using the scale adapted by Kozlinska et al. (2020) from the GUESSS study (Sieger et al., 2014). It comprised 14 items containing statements on the students' perception of their ability to carry out a certain number of entrepreneurial tasks. The main question introducing the 14 items was: "To what extent do the following statements apply to you? Please indicate the score for each statement." The possible responses were presented on a five-point Likert scale ranging from 1 = totally disagree to 5 = totally agree. The reliability test (Cronbach's alpha = .944; composite reliability = .951) on the 14 items revealed excellent internal consistency.

Intentions. Entrepreneurial intentions were measured using the six-item scale proposed by Liñán and Chen (2009), one of the most widely used scales in the field. For each item, students were asked to indicate the extent to which they agreed with the statements on a five-point Likert scale ranging from 1 = Totally disagree to 5 = Totally agree. One of the items was "My professional goal is to become an entrepreneur." Two of the items had a low external load and were withdrawn. The reliability test on the four selected items (Cronbach's alpha = .919; composite reliability = .943) showed excellent internal consistency.

Entrepreneurial Behavior. For this study, entrepreneurial behavior refers to engagement in activities that contribute to the creation of a business (Delanoë-Gueguen & Liñán, 2019; Joensuu-Salo et al., 2015; Neneh, 2019; Rauch & Hulsink, 2015). This construct was measured using a scale adapted by Rauch and Hulsink (2015) and based on the Panel Study of Entrepreneurial Dynamics (Reynolds, 2006), consisting of 19 binary questions (Yes/No) related to the performance of entrepreneurial tasks. The first question was: "Are you currently trying, alone or with others, to start a new business, including self-employment or selling goods or services to third parties?" The remaining 18 questions were introduced by "Even if you are not currently trying to create a business, it would be interesting to know whether you have undertaken any steps to start a business." The value of the construct was calculated as the average of these different items by dividing the total number of "yes" responses from each participant by the number of items (i.e., 19).

Control Variables. Five control variables were used in the various analyses as they are known to have confounding effects on the study's variables. These include gender (Nowinski et al., 2019), age (van Gelderen et al., 2018), having a parent who is an

entrepreneur (Zellweger et al., 2011), having previously received entrepreneurship training (Liu et al., 2019), and having participated in extracurricular activities (Bazan et al., 2019).

Analysis of the Quality of the Measurement Scales

We conducted a series of analyses to test the measures' validity and the constructs' psychometric qualities. Exploratory factor analyses reported adequate fit indices except for one item for ESE, one for entrepreneurial intention, and two for entrepreneurial knowledge, where the results suggested that they should be removed.⁶ We did so. We then tested for convergent validity using the value of the average variance extracted—all measures report scores above the recommended threshold of .50. Discriminant validity was tested using the Fornell-Larcker criterion and the Heterotrait-Monotrait Ratio method. Except for the attitude and intention measures, which have similarities slightly higher than expected, which is normal theoretically, all the other measures have ratios better than the suggested limits. The variance inflation factor (VIF) analysis suggests no multicollinearity. Thus, the measures used in this study appear acceptable for subsequent analyses.

Results

This section presents the correlation matrix with the means and standard deviations of the variables used. Then we will describe the control variables to see if there are differences between the treatment and control groups. We will present the differences in the means between the two groups before conducting regression analyses to verify the effect of participating in the training program on the change in the variables selected for this research.

Table 4 presents the correlation matrix with the means and standard deviations. It should be noted that the mean level of entrepreneurial attitude (T1) is 4.07 (out of 5.00), and entrepreneurial intention (T1) is 4.23 (out of 5.00). This suggests that the students ($n = 62$) already have strong entrepreneurial attitudes and intentions with a marginal possibility of improvement. This is not the case for entrepreneurial knowledge (T1), with a mean of 2.25 (out of 5.00), and ESE (T1), with a mean of 3.30 (out of 5.00). Entrepreneurial behavior (T1) shows that 26% of the list of activities had been completed before participation in the research, suggesting room for improvement in participating in the program.

As shown in Table 5 below, there is no significant difference between the two groups (experimental and control) in terms of gender, age, having a parent who is an entrepreneur, or having previously received entrepreneurship training. However, it should be noted that female students outnumber male students in the experimental group (53.1% versus 46.9%). In the control group, male students outnumber female students (60% versus 40%). These differences are not significant. Similarly, 70% of the students in the control group have at least one parent who is or has been an entrepreneur. In

Table 4. Means, Standard-Deviations and Correlation Matrix of the Variables.

	Mean	S.D.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. EEP	.52	.50	I														
2. Gender (female = 0)	.53	.50	-.131	I													
3. Age	22.10	1.85	.051	.049	I												
4. Extracurr. ACT.	.74	.44	.240	-.036	-.250	I											
5. Parent	.65	.48	-.111	-.020	.186	-.129	I										
6. ENT. TRAINING	.40	.50	.006	.046	.154	.259*	.060	I									
7. Knowledge T1	2.25	.87	.090	.181	.083	.155	.056	.526**	I								
8. Knowledge T2	3.33	1.08	.512**	.040	-.022	.264*	-.073	.379**	.434**	I							
9. Attitudes T1	4.07	.96	.263*	.012	.070	.056	-.005	.204	.416**	.267*	I						
10. Attitudes T2	4.12	.93	.129	-.014	-.032	.065	-.022	.387**	.425**	.402**	.707**	I					
11. ESE T1	3.30	.83	.088	.079	.061	.005	.028	.247	.549**	.450**	.642**	.552**	I				
12. ESE T2	3.75	.92	.341**	-.027	.041	.210	-.018	.321*	.470**	.799**	.467**	.584**	.729**	I			
13. Intentions T1	4.23	.92	.280*	.006	.028	-.054	.058	.109	.467**	.244	.821**	.586**	.623**	.436**	I		
14. Intentions T2	4.31	.88	.183	.014	.001	.054	.142	.156	.393**	.403**	.720**	.779**	.595**	.616**	.721**	I	
15. Behaviour T1	.26	.36	-.480**	.267*	-.126	-.063	.126	.097	.076	.025	-.297*	-.116	-.130	-.031	-.277*	-.126	I
16. Behaviour T2	.29	.35	-.410**	.255*	-.100	-.043	.167	.078	.101	.049	-.276*	-.151	-.125	-.011	-.233	-.142	.869**

Table 5. Description of the Control Variables.

	Experimental	Control	Fisher test sig
Male	46.9%	60.0%	.218
Involvement in extracurricular activities	84.4%	63.3%	.054
Parent or loved one who is an entrepreneur	59.4%	70.0%	.275
Previously received entrepreneurship training	40.6%	40.6%	.583
			t Test sig
Age	22.2	22.0	.696

contrast, only 59.4% of the students in the experimental group do. The proportion of students who have previously received entrepreneurial training is identical in both groups (40.6% each). This is also the case for age. The average age in the experimental group is 22.2 years old compared to 22.0 years old in the control group.

Contrary to the other variables, students in the two groups are significantly different regarding participating in extracurricular activities (p -value of .054). In the experimental group, 84.4% of the students participated in such activities. In contrast, only 63.3% of the control group had the same experience. Extracurricular activities refer to being a member of one of the university clubs whose main activities include setting up social projects, organizing events and seminars on employability and self-employment within their institutions, and participating in national and international social entrepreneurship competitions where students are asked to pitch and defend their project ideas. Organizing these events requires students to complete several activities, such as planning and assigning tasks, seeking funding, setting up sponsorship files, etc. All of these activities expose students to the world of entrepreneurship.

The means of the different constructs were compared to ensure that the two groups were identical. The independent samples t test was used for this purpose. The results show no significant difference between the two groups regarding knowledge and ESE (see Table 6). However, the students in the control group have significantly higher attitudes and entrepreneurial behavior than those in the experimental group. Conversely, the students in the experimental group have significantly higher intentions than the students in the control group. Since the selection was random, this situation was caused by chance, but it was considered when interpreting the results.

Effects of the Program on Entrepreneurial Outcomes

A series of multiple linear regressions were used to test the hypotheses. Gender, age, having a parent who is an entrepreneur, being involved in extracurricular activities, and prior entrepreneurial training were controlled for in all models used. In addition to these variables, the predictive model for each entrepreneurial outcome included the pretest data as a control variable. The results of the analyses showed that the program only

Table 6. Means Comparison Between the Two Groups.

		Experimental	Control	t test sig.
Knowledge	Pre-test	2.3229	2.1667	.485
	Post-test	3.8646	2.7667	.000
	Change	1.5417 (.000) ¹	.6000 (.018)	.000
Attitudes	Pre-test	4.3125	3.8111	.045
	Post-test	4.2396	4.0000	.324
	Change	-.0729 (.672)	.1889 (.525)	.161
Ese	Pre-test	3.3702	3.2256	.502
	Post-test	4.0505	3.4308	.007
	Change	.6803 (.001)	.2051 (.405)	.004
Intentions	Pre-test	4.4766	3.9667	.033
	Post-test	4.4688	4.1500	.160
	Change	-.0078 (.961)	.1833 (.513)	.269
Behavior	Pre-test	.3174	.5316	.002
	Post-test	.4424	.5544	.061
	Change	.1250 (.272)	.0228 (.950)	.012

^aValues in parentheses are the *p* value of the before/after mean comparison test within each group.

affected knowledge and ESE (see [Table 7](#)). There were no significant effects on attitudes, intentions, or behavioral outcomes.

The predictive model of entrepreneurial knowledge (Model 2) significantly explains 36.8% of the variance in entrepreneurial knowledge. The analyses show that practice-based pedagogical approaches significantly increase students' entrepreneurial knowledge ($\beta = .506$; $p = .000$), which alone explains 23.9% of the phenomenon ($\Delta \text{Adj } R^2$). These results are corroborated by the means comparison test on the mean change in entrepreneurial knowledge between the pretest and posttest ([Table 6](#)). Knowledge improved significantly for students in both the experimental and control group. However, the improvement in the experimental group is higher than in the control groups (1.5 versus .6). In addition, the observed difference is significant. This suggests that the program positively affected the students' entrepreneurial knowledge. These results support hypothesis H1, which suggests that participating in a program to support nascent student entrepreneurs through action-based pedagogical approaches significantly improves entrepreneurial knowledge. [Figure 2](#) illustrates the changes between the groups.

The model used to test hypothesis H2 significantly explains 19.8% of the variance in ESE ([Table 7](#), Model 6). Similar to entrepreneurial knowledge, ESE was significantly improved by the program ($\beta = .349$; $p = .006$). The variance explained by the training program alone is 10.5% ($\Delta \text{Adj } R^2$). Although ESE improved in both groups (experimental and control), the program helped to increase ESE in the experimental group. Between pretest and posttest, the ESE of these students improved by an average of .68 points, whereas students in the control group improved by only .21 points ([Table 6](#)). Furthermore, the comparison test of the two groups (experimental and

Table 7. Impact of the Program on Entrepreneurial Career Indicators.

	Knowledge		Attitudes		ESE		Intentions		Behaviour	
	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10
GENDER (female = 0)	-.023	.054	-.042	-.047	-.118	-.071	.018	.013	.015	.017
AGE	-.023	-.104	-.181	-.175	.054	-.001	-.035	-.029	-.151	-.167
Extracurr. ACT.	.155	.014	-.114	-.103	.260†	.159	.115	.126	.061	.026
PARENT	-.081	-.027	-.030	-.033	-.041	-.005	.149	.145	.148	.152
ENT. TRAINING	.180	.259*	.385***	.380***	.138	.176	.069	.064	-.104	-.103
KNOWLEDGE T1	-.490**	-.565***	-.473***	-.463***						
ATTITUDES T1										
ESE T1					-.280*	-.321*				
INTENTIONS T1							-.431**	-.419**		
BEHAVIOUR.T1									-.538***	-.484***
EEP		.506***		-.038		.349***		-.037		.145
F Variance sig	.032	.000	.002	.004	.075	.007	.029	.050	.001	.001
R ²	.215	.441	.309	.310	.182	.290	.219	.220	.328	.344
R ² (adjusted)	.129	.368	.233	.220	.093	.198	.134	.119	.254	.259

† = $p \leq .10$; * = $p \leq .05$; ** = $p \leq .01$; *** = $p \leq .001$.

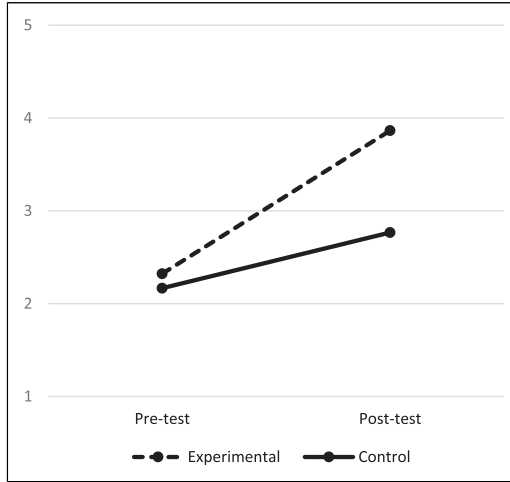


Figure 2. Changes in student nascent entrepreneur knowledge in both groups.

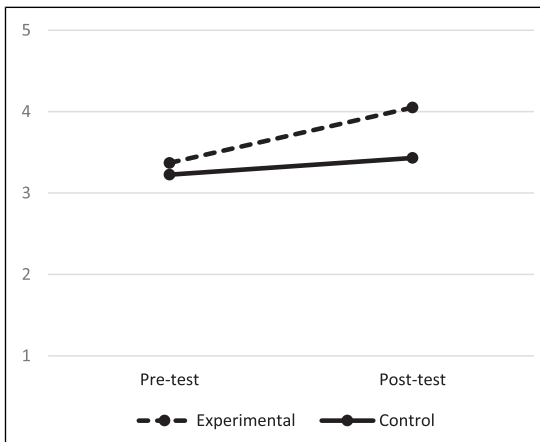


Figure 3. Changes in student nascent entrepreneur ESE in both groups.

control) revealed that the observed difference is statistically significant. Similarly, when comparing the level of ESE of the students in each group at the pretest and posttest, the improvement observed in the experimental group is significant (p -value = .001). On the other hand, although the ESE improved in the control group, this improvement was not significant (p -value = .405) (see Table 6). Therefore, it can be concluded that the program positively affected the students' perception of their ESE, supporting Hypothesis H2. Figure 3 illustrates the changes between the groups.

The predictive model for entrepreneurial behaviors explains 25.9% of the variance (Table 7, Model 10). The regression results indicate a small and non-significant positive effect of the program on students' engagement in entrepreneurial behaviors ($\beta = .145$; $p = .250$). However, as can be seen in Table 6, although the increase in entrepreneurial behavior in the experimental group is not significant ($p = .272$) as it is for the control group ($p = .950$), the increase in the experimental group compared to the control group is significantly higher ($p = .012$). This suggests that the behavioral progression of program participation is effective. These results do not fully support the final hypothesis of this study. H3 is partially accepted.

Using multiple comparisons of means is likely to increase Type I errors, and therefore a Bonferroni correction may be necessary. Considering the use of five comparisons (one comparison per indicator used), it is suggested to use the threshold of $p \leq .01$ (i.e., $p = .05$ divided by five). This correction would not change the interpretation of the results obtained, as the knowledge and ESE thresholds are below the corrected threshold, and the behavior change is very close to the corrected threshold ($p = .012$). However, considering our multivariate analyses, we still arrive at a partial acceptance of the hypothesis (H3).

The model used to test attitude (hypothesis H4) change significantly explains 22% of the variance in the students' attitudes toward entrepreneurship (Table 7, Model 4). However, the program did not significantly affect their attitudes ($\beta = -.038$; $p = .758$). Furthermore, the regression coefficient is negative. In the experimental group, students' attitudes toward entrepreneurship decreased after their exposure to the program. Conversely, the attitudes of the control group improved slightly. As indicated in Table 6, the observed difference is not significant. As a result, participation in a program designed for student nascent entrepreneurs using action-based pedagogical approaches would not significantly improve students' attitudes toward entrepreneurship, as expected. These results support this idea (H4).

Finally, the model used to test the change in entrepreneurial intentions (hypothesis H5) explains 11.9% of the variance in entrepreneurial intentions (Table 7, Model 8). As with attitudes, the program did not significantly improve entrepreneurial intentions ($\beta = -.037$; $p = .781$). The same observation is made in Table 6, where neither the experimental nor the control group improved their intentions, and the change between the groups is insignificant ($p = .269$). Thus, as expected, participation in the program does not significantly improve the entrepreneurial intentions of nascent student entrepreneurs. The results confirm this assumption (H5).

Discussion and Conclusion

This study aimed to analyze the causal effect of a practice-based entrepreneurship education program on a set of entrepreneurial career-related outcomes, i.e., knowledge; attitudes; ESE; intentions; and behavior. Five hypotheses were formulated to test such effects. The program only significantly improved students' knowledge and ESE; an

equivocal result was found for behavior. As expected, no significant effects were found for attitudes and intentions.

This study shows that learning entrepreneurship through action is an excellent way to improve knowledge, which is consistent with several previous observations (Bell & Bell, 2016; George, 2015; Gielnik et al., 2015; Heinonen, 2007; Liang et al., 2016; McCrea, 2013; Newbery et al., 2016; Niehm et al., 2015; San Tan & Ng, 2006; Woodier-Harris, 2010). Incorporating practice in the learning process can demystify the entrepreneurial process and increase knowledge, especially procedural knowledge (Bell & Bell, 2016; Volery et al., 2013). With an action-based approach, students go beyond mere perception by better understanding the entrepreneurial reality (George, 2015). As a result, individual perception of their knowledge is improved. It should be noted, however, that the control group also advanced their entrepreneurial knowledge, but to a different extent than the experimental group. This suggests that nascent student entrepreneurs will likely be self-directed learners to advance their projects. However, attending a program to provide them with relevant learning will accelerate this learning.

Regarding ESE, the study results show an improvement among students engaged in an action-based entrepreneurship teaching approach. These results corroborate prior research (Koenig, 2016; Liu et al., 2019; Maritz & Brown, 2013; Newman et al., 2019; Nowinski et al., 2019). As suggested by social learning theory (Bandura, 1986, 1997), which is embedded in the social cognitive career theory (SCCT), experiential pedagogical approaches provide mastery experiences that can strengthen ESE. Practice-based pedagogical approaches encourage students to experiment with entrepreneurial tasks. By participating in such tasks, students can acquire specific skills through practice. Even better, this strengthens individual confidence in their ESE. Similarly, Bell and Bell (2016) have shown that when students draft a business plan and validate it during the course, their confidence in entrepreneurial skills increases. Learning by doing allows them to develop the skills needed to be an entrepreneur. Conducting pedagogical activities as part of a cohort of students also fosters vicarious learning, just as frequent interaction with the individuals providing the training allows for verbal persuasion of the students' abilities regarding their project. These are two factors that promote the development of ESE.

It should be noted, however, that the entrepreneurial behavior of the experimental group showed significantly more progress than that of the control group, suggesting that either this progress was caused by the instruction received or that the progress was not linear and eventually plateaued. The small sample size of participants in the experiment ($n = 32$) makes Type II errors also very likely. This situation could provide a non-statistically significant change not because the program was not effective, but because of the small power of the tests. For these reasons, no firm conclusions can be drawn.

On the other hand, the results did not show any significant effects of participation in a special program designed with action-based pedagogical approaches on attitudinal and intentional outcomes. There are two possible explanations for these findings. First, a methodological explanation could be that despite the random assignment of

individuals to the experimental conditions, this group demonstrated higher levels of attitudes and intentions than the control group before the start of the program, while the latter was more advanced in behavior. Simply knowing that they were randomly selected to participate in the program may have increased their attitudes and intentions, leaving them less likely to progress once the training was completed. A second explanation is that having a clear business idea and wanting to enroll in a program designed to support nascent student entrepreneurs implies that one already has a strong attitude and intention to become an entrepreneur. Our results suggest this and are consistent with what [Bae et al. \(2014\)](#) found in their meta-analysis. This indicates that high entrepreneurial attitudes and intentions could act as necessary conditions ([Dul, 2016](#)) for enrolling in this program. As a result, the intervention could have minimal effect on the variation of these indicators.

This study contributes on several levels. Firstly, it helps to demonstrate the importance of taking into account the stage of the entrepreneurial process to develop appropriate courses and activities. Indeed, our results suggest that once an individual has taken action to start their business, he or she is likely to have sufficient entrepreneurial intentions and sufficiently positive entrepreneurial attitudes. These intentions and attitudes may be necessary but not sufficient conditions for taking action ([Dul et al., 2020](#)). Our work reminds us of the importance of matching learners' needs, their specific situations in the entrepreneurial process, and the activities proposed in the training. In this regard, the impact indicators must be appropriate to their initial progress and the duration of the experiment. In particular, a follow-up over several years would have had to focus on creating the organization and its performance, considering that the individuals could have continued their entrepreneurial momentum by creating the organization. Our study shows that when supporting nascent student entrepreneurs, specific activities should be proposed to help them progress in their business creation rather than focusing on developing career-related attitudes and commitment. Besides, although active pedagogy was used to deliver content, nothing in the program was designed to support the progression of business creation, such as the use of the Lean Startup process ([Bortolini et al., 2018](#); [Lizarelli et al., 2021](#); [Silva et al., 2020](#)).

Second, this study helps demonstrate the impact of specialized programs targeting university students most engaged in entrepreneurship to help them progress toward starting their businesses. Although we could not show behavioral progress when comparing the treatment and control groups, we did find a significant change in the entrepreneurial behavior of the treatment group from the pretest to the posttest. Furthermore, the results illustrate a significant increase in terms of knowledge and ESE. The latter is an essential determinant of entrepreneurial goal attainment and entrepreneurial performance ([Baron et al., 2016](#); [Hechavarría et al., 2012](#); [Newman et al., 2019](#)). It is, therefore, possible that this effect may be observed over a more extended period. While some universities offer basic entrepreneurship training that is open to all or sometimes reserved for specific programs, the findings show encouraging results for the support provided further downstream in the entrepreneurial process, such as the support provided by particular coaching or mentoring structures in the entrepreneurial

ecosystem (St-Jean & Jacquemin, 2022; St-Jean & Tremblay, 2020). This contributes by highlighting the need to develop support systems that could help nascent student entrepreneurs progress in their business creation process. In this regard, university business incubators could help achieve this type of outcome (Ali et al., 2020; Nicholls-Nixon & Valliere, 2020) and may be more appropriate than a short-term training program, although both can work together with different objectives.

Lastly, this study was conducted in Morocco. We contribute to validating the effects of these programs outside of Western countries, where most of these studies have been conducted in the past. Although recent experiments have been conducted in developing countries about entrepreneurial training and support for established entrepreneurs (e.g., Bruhn & Zia, 2011; Chong & Velez, 2020; Dyer et al., 2016; Fiala, 2018; Huis et al., 2019; Valdivia, 2015), very few experimental studies have been conducted in developing countries such as Morocco on the impact of entrepreneurship education on nascent student entrepreneurs. Thus, a meta-analysis showed that entrepreneurship education might have less impact on entrepreneurial intentions in countries such as Morocco, where the culture of citizens is oriented towards uncertainty avoidance and where gender inequality is high (Bae et al., 2014). Our results confirm this situation since we need to demonstrate the effect of entrepreneurship education on entrepreneurial intention. However, as discussed earlier, this is likely caused by the fact that the group already had a solid entrepreneurial intention when they started the training. However, we show that nascent student entrepreneurs in Morocco can progress in their entrepreneurial knowledge, self-efficacy, and entrepreneurial behaviors when exposed to a specific experiential pedagogy. This pedagogy type is relevant, although Moroccans probably need to become more familiar with it within the Moroccan school system (Chafi et al., 2016). This study helps validate the relevance of these approaches to entrepreneurship across cultures. It also helps to generalize our understanding of the phenomenon. Although our findings are interesting, uncertainty avoidance could help reduce the maintenance of effort in implementing the entrepreneurial project. Indeed, we need to find out the medium- and long-term effects of participating in this type of training in a context less conducive to the emergence of entrepreneurial projects due to more significant uncertainty avoidance (Wennberg et al., 2013). Therefore, our results suggest longer longitudinal follow-ups in contexts such as Morocco in the future to see the longer-term effect of entrepreneurship education.

Managerial Implications

From a managerial point of view, these programs are instrumental in acquiring knowledge, skills, and competencies, developing ESE, and improving entrepreneurial behavior, at least marginally. For students who enter the entrepreneurial process with strong entrepreneurial intentions and a high entrepreneurial attitude, those who enroll in these programs may be more concerned about their success and seek to prepare well. Thus, this type of program does not affect stimulating entrepreneurial intention or, more broadly, developing the attitudes needed to be an entrepreneur. It does not even

significantly affect the progress and success of the students' projects. It would probably be appropriate to offer these programs in conjunction with other types of support, such as mentoring and coaching (Radu Lefebvre & Redien-Collot, 2013; St-Jean et al., 2018), or incubation services (Assenova, 2020) capable of providing medium-term support that allows for adjustments according to the needs expressed.

Study Limitations

It is essential to emphasize the limitations of this study. Firstly, although a rigorous research design was used, the sample size was small. This may limit the ability to detect specific effects of the program. Larger cohorts would be needed in the future. Secondly, although the participants were randomly assigned to the experimental and control groups, significant differences in certain variables were observed before the program began. However, these differences were controlled for in the analyses to prevent them from confounding the effects of the program. Thirdly, the program that was the focus of the experiment was very short (about one and a half months). Thus, the results were measured over a very short period. Therefore, it is impossible to know what might happen in the medium and long term, so it is recommended to follow them for at least one year after graduation. Fourthly, even if positive results were obtained at the level of knowledge and ESE in the context of active pedagogy, the reader should keep in mind that this is not a demonstration of the effect of experiential pedagogy in developing ESE and knowledge but rather that this development was observed in this context of experiential pedagogy. Other pedagogical approaches may yield similar results, but these considerations are beyond the scope of this manuscript. This suggests further work on this specific issue in the future. Fifthly, it is possible that the experiment had an experimental bias due to the knowledge of being manipulated. For example, being selected to participate in the program may have influenced the scores on entrepreneurial attitudes and intentions from a social desirability perspective. This type of bias could affect even the progress of knowledge and ESE. Future research could use the Solomon four-group design to overcome this potential bias (Braver & Braver, 1988). Sixthly, some items were removed from the selected measures because the factor analyses suggested they did not fit well in terms of validity. Although this is a potential bias, we conducted the same analyses with all items. The results were the same. Therefore, this possible bias did not affect our results. Seventhly, participants in the control group still need to receive the training, with no guarantee that it would occur in the future or that they would be selected at that time. A quasi-experimental research design could have avoided this inconvenience (e.g., Costa et al., 2018), but this would have reduced the demonstration's quality. On the other hand, it was not possible to accommodate more than about 30 people. Therefore, it was necessary to turn people away, which made it possible to use randomization to select the selected people. Finally, the results could be generalized to contexts other than Morocco. However, it is reasonable to assume that these effects might be different, thus suggesting research in less studied cultural contexts.

Future research should have longer follow-ups to see the longer-term effect of the changes observed, especially on ESE. Indeed, some studies show the short-term effect of education on entrepreneurial self-efficacy, suggesting that this may be the case here and in similar settings (St-Jean, Tremblay, Fonrouge, & Chouchane, 2022). Moreover, although the focus on nascent student entrepreneurs sheds new light on entrepreneurship education, it appears that high attitudes and intentions are necessary conditions for action. Therefore, they cannot be improved by support programs. On the other hand, other constructs such as entrepreneurial identity (Radu-Lefebvre et al., 2021), entrepreneurial career commitment (Baluku et al., 2020), or the ability to create a business more quickly and sustainably could be mobilized in the future. Further research should also be conducted to understand in depth what nascent student entrepreneurs need to move forward and operationalize their businesses. Finally, a research design that includes two different and varied treatments of different pedagogies (e.g., active vs. passive) would make it possible to demonstrate the specific effect of active pedagogies in supporting nascent student entrepreneurs.

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Notes

1. Law 01/00, promulgated in 2000, organizes the higher education system and allows the Moroccan university to redefine its mission and integrate entrepreneurship into its system through the introduction of the entrepreneurial spirit (Art 129) and encouraging the creation of university incubators (Art 7)
2. Source: HCP (*Haut Commissariat au Plan*, or High Commission for Planning). <https://www.hcp.ma/>
3. See article 129 of the law mentioned above. To download the law: https://planipolis.iiep.unesco.org/sites/default/files/ressources/morocco_enseignement_superieur_loi_fr.pdf
4. See article 7.

5. SALEEM is the acronym for *Structuration et accompagnement de l'entrepreneuriat étudiant au Maghreb* (Structuring and support for student entrepreneurship in the Maghreb). More info at: <https://www.projet-saleem.org/>
6. We tested all of our models and analyses with all the items, and the results came to the same conclusion as when the problematic items were removed. These results can be provided upon request

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