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# An empirical investigation of the effectiveness of online entrepreneurship education among university students in Egypt

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# An empirical investigation of the effectiveness of online entrepreneurship education among university students in Egypt

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**Abstract:** Since providing entrepreneurship education to students without examining its impact might not lead to achieving the desired goals, coupled with the lack of research on the impact of online entrepreneurship education, it is important to understand the role and effectiveness of this medium of teaching to develop entrepreneurial students. Thus, this study explores the direct effect of online entrepreneurship education on Egyptian students' entrepreneurial attitude, self-efficacy, and interest, to inform educators if they will need to adjust their pedagogical approaches, to improve the students' learning outcomes and as well universities to put right strategies for their online entrepreneurship education programs. A survey based on the Engineering Entrepreneurship Survey developed by Duval-Couetil, Reed-Rhoads and Haghighi, was emailed to a total of 400 university students enrolled in entrepreneurship courses, divided into two groups according to the medium of delivery. The results have shown that online EE has a positive impact on students, however, it remains less than online EE.

**Keywords:** entrepreneurship; entrepreneurship education; online learning; self-efficacy; entrepreneurial attitudes; coronavirus.

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**Biographical notes:** Hala Wasef Hattab is an Associate Professor of Entrepreneurship at the British University in Egypt, entrepreneurship and innovation consultant, trainer and researcher. She led the Global Entrepreneurship Monitor – Egypt team for 3 consecutive cycles and wrote the report for 2008, 2010 and 2012. She has special interest in entrepreneurship education, and youth and women entrepreneurship. She is a Member of the editorial boards of different journals and a regular reviewer for entrepreneurship-specialised journals and conferences. She is a founding member of Middle East Council for Small Businesses and Entrepreneurship and has mentored and trained over than 100 startups in Egypt and across the Middle East.

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## 1 Introduction

Entrepreneurship has been recognised as an engine for social and economic development; entrepreneurs are perceived as change agents who introduce new ideas and organisational practices (Feldman et al., 2020) and their start-ups are a major source of innovation employing emerging technologies to invent products (Kohler, 2016). This has called policy makers, governments, and researchers to consider and deploy different approaches to promote and boost entrepreneurship within their countries. One of which is entrepreneurship education (EE) (Fretschner and Weber, 2013). Although a consensus has not been reached on whether entrepreneurship can be stimulated through education or not (Boldureanu et al., 2020), a significant amount of literature acknowledges its role in developing students' entrepreneurial skills, attitudes, intention, and behaviour (Fayolle and Lassas-Clerc, 2006; Pittaway and Cope, 2007; Hattab, 2014; Barba-Sánchez and Atienza-Sahuquillo, 2018), hence preparing them to be more entrepreneurial.

Due to the outbreak of coronavirus pandemic, students and educators across all levels of education were forced to rapidly shift away from face-to-face classes and adopt and adapt to online learning (Rajab et al., 2020) as a subsequent implementation of social distancing. On 1 April 2020, UNESCO has estimated that more than 1.5 billion learners were affected because of the closure of schools and higher education institutions (HEIs) in 185 countries, which constitute 89.4% of total enrolled learners (Marinoni et al., 2020). A similar trend is found in Egypt (Moawad and Corkett, 2021). The education sector was and remains one of the sectors that has been the most affected by the pandemic (Taha, 2020) with approximately twenty million students enrolled in schools and universities across the country. While there was already high growth of online learning before the pandemic (de Jong et al., 2020), the scale of the current crisis's impact on education is unprecedented (Tanveer et al., 2020). Scholars believe that the impact of this – and the developments required to make it work – could permanently change how education is delivered.

As entrepreneurship education covers a wide variety of audiences, objectives, contents, and pedagogical methods, it requires a flexible and informal learning environment. Even without COVID-19 outbreak's influence, EE needs to catch up with the speedy transition in the business world to deliver effective learning courses to support developing entrepreneurial students with entrepreneurial mindset (Takemoto and Oe, 2021). Hence some researchers claim that online platforms can be one of the tools to achieve the aims of entrepreneurship education as the relationship with technology has significant impact on various aspects of business behaviour. However, most of research about entrepreneurship education have discussed the traditional classroom offerings, while the online education has been scarcely documented (Audet et al., 2018).

Since providing EE to students without examining its impact on students' intentionality, might not lead to achieving the desired goals (Sahoo and Panda, 2019), coupled with the lack of research on the impact of online EE, this study aims at

answering the following question: Can online entrepreneurship education contribute to developing entrepreneurial students as effectively as classroom teaching? This study explores the direct effect of online entrepreneurship education on Egyptian students' entrepreneurial attitude, self-efficacy, and interest. It also assesses whether the online entrepreneurship education courses are effective enough to foster the individual competencies, willingness, or drive of an individual to choose entrepreneurship as a career option.

The rest of the paper is structured as follows: a literature review section giving an overview of previous research on entrepreneurship education and the migration to online education, followed by the methodology section to clarify the sample and methods of data collection employed; the study results section reporting and discussing the outcomes from the statistical analysis and finally conclusion section providing the implications for theory and practice, the limitations of the research and future research recommendations.

## 2 Literature review

According to the International Labor Organization (2019) the landscape of employment has been changing; it is more evident that students' interest in choosing entrepreneurship as a career choice is growing, while the interest in traditional jobs is gradually declining. This has been reflected on the expected role of HEIs; forcing them to change their pedagogies to provide an effective support system to their students so that they will become job creators, not job seekers (Tomy and Pardede, 2020) as a part of their third mission (Compagnucci and Spigarelli, 2020). It is believed that entrepreneurship education goes along with this line of thought, to equip graduates with desirable skills and an additional career path beyond employment in the public or private sector (Kuckertz, 2021) and help the citizens of the knowledge-based society to become architects of their destiny (Strano, 2016).

The establishment of entrepreneurship education at HEIs is a phenomenon that started for over sixty years at business schools and gained traction in the 1990s (McMullen, 2019) and has been a tremendous success on a global scale (Kuckertz, 2021). An earlier definition of Entrepreneurship education (EE) provided by McIntyre (2000, p.33), is "the process of providing individuals with the concepts and skills to recognise opportunities that others have overlooked, and to have the insight and self-esteem to act where others have hesitated". However, many scholars believe that entrepreneurship education should be considered as a model of lifelong learning (Linan, 2004) not for venture creation only, hence a modified definition was introduced which is a "pedagogical courses, programs and processes offered to students to develop or strengthen their entrepreneurial traits, attitudes and skills" (Hahn et al., 2017, p.945). While Shepherd and Douglas (1997) viewed EE as an enabler to create a new business venture while impacting the personal abilities of individuals to and instil and enhance the personal abilities to exploit opportunities.

Researchers have found that entrepreneurship education helps in fostering individual competencies or individual entrepreneurial orientation (Farashah, 2013; Franco et al., 2010; Lindberg et al., 2017; Robinson and Stubberud, 2014), which leads to the development of entrepreneurial intention (Fayolle and Liñán, 2014; Ferreira and Trusko, 2018; Hassan et al., 2020; Anwar et al., 2020; Shapero and Sokol, 1982), while Bae et al. (2014) and Botha and Bignotti (2016) argued that entrepreneurship education can shape

the individual's attitude toward entrepreneurship. While Peterman and Kennedy (2003) found that the ability and desire to undertake a venture increased among students after participation in an entrepreneurship program, Olugbola (2017) argued that every individual has a certain level of opportunity identification, and this can be improved through training and education. However, some studies produced different findings, for example, Karimi et al. (2016) and Oosterbeek et al. (2010), found that the differences in the intention to start a venture before and after attending an educational program were not significant.

One of the major issues in entrepreneurship education is how the subject should be taught (Pittaway and Cope, 2007). The more the field has been evolving, the discussion continues regarding course content, the use of technology-driven pedagogy and effectiveness measures (Solomon, 2007). Moreover, the educators are still debating on the appropriate educational objectives of entrepreneurship programs (Ahmad et al., 2018), hence no consensus is reached yet on the effective teaching techniques for EE. Though there are several traditional and non-traditional methods related to EE, for example, action-based entrepreneurship programs (Rasmussen and Sørheim, 2006), the literature remains divided on the effectiveness of traditional methods to teach entrepreneurship (Al-Atabi and DeBoer, 2014).

The COVID-19 outbreak, has created the largest disruption of education systems in human history, impacting billions of learners worldwide. The social distancing, restrictive movement policies and closures of schools and universities (Pokhrel and Chhetri, 2021) have significantly disturbed the traditional educational practices and left no way but to depend on the digital/online learning. Singh and Thurman (2019) defined online learning as the use of the internet in some way to enhance the interaction between teacher and student. Wang et al. (2020) described the remote learning as the use of online educational technology for knowledge sharing and dissemination of information, and includes several delivery methods, mainly Zoom, Microsoft Teams and E-learning (Ibrahim et al., 2021). Although it is still early to judge the effectiveness of the transition to online education due to the pandemic, but some initials findings have revealed that it has sufficiently contributed toward the goal of the pragmatic approach in business education (Chiabrishvili et al., 2021); this transition did not only offer a solution for this unprecedented global pandemic, but offered an open, flexible, and accessible learning environment (Naidu, 2017) and availed new opportunities to youth (Youssef et al., 2021) who responded well as they have been actively connected to the internet on daily basis (Hu-Au and Lee, 2017).

While online entrepreneurship education is not novel (Liguori and Winkler, 2020), it has not yet gained the widespread adoption (McPherson and Bacow, 2015). According to Rippa and Secundob (2019, p.2): "to the best of our knowledge, the existing research has largely neglected the potential of digital technologies in the academic entrepreneurship process". Moreover, there is lack of consensus regarding its effectiveness, for example, Chen et al. (2021) consider the online learning to be an obstacle to the effective delivery and provision of entrepreneurship education as it hinders the "learning by doing" required for learning to happen; while findings of research conducted by Moberg (2021) on the role and effect of online EE program showed that these programs can significantly influence young individuals' entrepreneurial awareness.

Given the interest and involvement of HEIs in creating entrepreneurship curricula and the migration to online education, the purpose of this study is to investigate Egyptian students' attitudes toward entrepreneurship and examine how online EE impacts a variety

of entrepreneurial outcomes. The research question addressed is: Can online entrepreneurship education contribute to developing entrepreneurial students as effectively as classroom teaching?

## 3 Method

To investigate the impact of entrepreneurship education and examine the research hypothesis, the researcher utilised an assessment instrument, Engineering Entrepreneurship Survey that was developed by Duval-Couetil, Reed-Rhoads and Haghighi in 2010 aimed at examining multiple outcomes of an entrepreneurship program delivered to engineering students (Purzer et al., 2016). The original assessment draws on survey items that fall into six categories including:

1 attitudes

2 behaviours

3 knowledge and skills

4 self-efficacy

5 perceptions of programs and faculty

6 demographic data.

The instrument has been validated and used by other scholars, for example, Castro and Zermeño, 2020; Purzer et al., 2016, for the same purpose. It has been chosen for the current study because it is a comprehensive tool that incorporated different scales to measure interests, perceptions and knowledge but is user-friendly and not so lengthy that students would hesitate to participate (Duval-Couetil et al., 2016).

For the current study, the researcher used the following three out of the six categories of the Engineering Entrepreneurship Survey, following the work of Duval-Couetil (2016):

1 *Attitudes*: Items focused on investigating students' interest in entrepreneurship, the attractiveness of entrepreneurship as a career choice and the reasons why they are or are not interested in entrepreneurship;

2 *Self-efficacy*: Items focused on investigating students' perception of their ability to perform entrepreneurial tasks; and

3 Perceptions of programs and faculty in terms of its usefulness in attracting students to entrepreneurship.

The survey items used Likert-type, 5-point, ordinal responses that represented verbal statements. To simplify the analysis and reporting of the data, 5-point response scales were collapsed into three by grouping responses. For example, the responses 'strongly agree and agree' were combined as were 'strongly disagree and disagree (Duval-Couetil et al., 2010).

To investigate the effectiveness of online education compared to classroom teaching in developing students' entrepreneurial behaviour and their attitudes toward entrepreneurship, the researcher targeted undergraduate students at the Egyptian

universities as a population for the current study while the sample constituted of students at the undergraduate level who are registered at entrepreneurship courses as part of fulfilling the requirements for their academic year. They were divided into two groups based on the medium of delivery; thus, one group was taught via online medium and the second group via face-to-face medium. The total number of the sample was 400 students divided almost equally between the two groups. The sampling was purposive where subjects (students) were selected based on the study's purpose with the expectation that each participant will provide information of value to the study. Although purposive sampling is non-probability sampling technique, but "the inherent bias of the method contributes to its efficiency, and the method stays robust even when tested against random probability sampling" (Tongco, 2007, p.148).

The data was collected from students using web-based self-administered questionnaire at the end of the semester which lasted for fourteen weeks. Overall response rate was 72% whereas for the first group it was 68% and the second group, it was 74%. However, after checking the completeness of surveys, a total of 48 surveys were discarded due to missing answers (23 surveys for the online sample and 25 for the offline sample).

The Cronbach's alpha of the constructs related to attitudes, self-efficacy and perception of program scales ranged between 0.8–0.92, which is according to rule of thumb is good (George and Mallery, 2003).

## 4 Results

Matlay (2008) and others have proven that entrepreneurship education had a positive impact on students' entrepreneurial outcomes, especially those related to the career aspirations but rarely the medium was considered. Thus, the current research is exploratory research aims at investigating the effectiveness of online EE on the entrepreneurial outcome for students at the undergraduate level through contrasting it with offline EE..This section presents the findings of the data analysed using Statistical Package for Social Sciences (SPSS).

But before proceeding with data analysis, assessment of the normality of data was conducted because it is considered as a prerequisite for many statistical tests (Mishra et al., 2019). Since the significance value of the Shapiro-Wilk test is above 0.05 then the null hypothesis that the data are normally distributed is accepted, hence the independent sample T-test has been used to test whether there is a difference in the dependent variable for two independent groups.

| | *Tests of normality* | | | | | |
|---|---|---|---|---|---|---|
| | *Kolmogorov-Smirnov*[a] | | | *Shapiro-Wilk* | | |
| | *Statistic* | *df* | *Sig.* | *Statistic* | *df* | *Sig.* |
| Attitude | 0.171 | 156 | 0.000 | 0.920 | 156 | 0.09 |
| Self-efficacy | 0.132 | 156 | 0.000 | 0.962 | 156 | 0.065 |
| Interest | 0.116 | 156 | 0.000 | 0.966 | 156 | 0.11 |

Students' Attitudes about entrepreneurship as a career choice.

As per Table 1, there is a difference between the two groups, whereas the mean for those who received the offline education is higher, indicating that the attitude towards starting their own enterprise is more impacted by the classroom and direct delivery than the online medium, which complies with the findings of Sithole and Lumadi (2012) that practicing starting own business impacts learners' tendency to start businesses, and this might be achieved online, but more evident within the offline context.

**Table 1** Group statistics using T-test

| *Mode of delivery?* | | *N* | *Mean* | *Std. deviation* | *Std. error mean* |
|---|---|---|---|---|---|
| Attitude | Offline | 123 | 7.0349 | 1.36107 | 0.12748 |
| | Online | 113 | 6.6667 | 1.29658 | 0.13981 |

Students were asked to rate their level of interest in several post-graduation options. Students in both groups were most interested in working for a multinational/large company (Table 2). The students who received offline EE were more inclined towards entrepreneurial ventures compared to those who received it online; they have higher level of interest in either starting their businesses or working for a start-up, 18.5% and 10.5%, respectively, compared to 13% and 1.5%, respectively. According to Khatri and Waraich (2019), career counselling and nature of programs impact students' employment preferences rather than the medium of delivery; but to the choice of becoming entrepreneurs is high when they participate in creativity programs, whether online or offline.

When students were asked about the reasons why they would and would not start their own businesses, each group expressed different reasons (Tables 3 and 4, respectively). For the students who received an offline education, the top three reasons for them to start a business is "I would start a business in order to make more money", "I would start a business in order to create something of my own" and I would start a business in order to focus on a technology/field/hobby that interests me", while the top reasons for those who received an online EE, were "I would start a business in order to have more flexibility and independence", "I would start a business in order to create something of my own", and "I would start a business in order to satisfy a need in a market". It is interesting to note that the least chosen reason for both groups was the same which is "I would start a business in order to follow a family tradition". The result for both groups complies with Hattab's (2014) findings that EE has a positive impact on students' positive perception of entrepreneurship.

**Table 2** Comparison of interest in post-graduation options

| | | *Mode of delivery?* | |
|---|---|---|---|
| | | *Online* | *offline* |
| % within Consider your after graduation options, I plan to | Attend graduate school | 10.0% | 90.0% |
| % within mode of delivery? | | 1.4% | 7.1% |
| % of Total | | 0.5% | 4.5% |
| % within Consider your after graduation options, I plan to | Start my own business | 41.3% | 58.7% |

**Table 2** Comparison of interest in post-graduation options (continued)

| | | *Mode of delivery?* | |
|---|---|---|---|
| | | *Online* | *offline* |
| % within mode of delivery? | | 35.6% | 29.1% |
| % of Total | | 13.0% | 18.5% |
| % within Consider your after graduation options, I plan to | Work for a startup | 12.5% | 87.5% |
| % within mode of delivery? | | 4.1% | 16.5% |
| % of Total | | 1.5% | 10.5% |
| % within Consider your after graduation options, I plan to | Work for multinational/large company | 41.4% | 58.6% |
| % within mode of delivery? | | 56.2% | 45.7% |
| % of Total | | 20.5% | 29.0% |
| % within Consider your after graduation options, I plan to | Work for the government | 50.0% | 50.0% |
| % within mode of delivery? | | 2.7% | 1.6% |
| % of Total | | 1.0% | 1.0% |

**Table 3** Reasons why students would start their own business

| *Item* | *Online* | | *Offline* | |
|---|---|---|---|---|
| | *Agree* | *Rank* | *Agree* | *Rank* |
| I would start a business because I have an idea for a business product or technology | 49% | 8 | 54% | 7 |
| I would start a business in order to follow a family tradition | 9% | 13 | 11% | 13 |
| I would start a business in order to focus on a technology/field/hobby that interests me | 64% | 6 | 72% | 3 |
| I would start a business in order to create something of my own | 74% | 2 | 75% | 2 |
| I would start a business in order to have more flexibility and independence | 76% | 1 | 69% | 4 |
| I would start a business in order to have more free time | 28% | 12 | 30% | 11 |
| I would start a business in order to solve a social problem | 46% | 9 | 51% | 8 |
| I would start a business in order to make more money | 70% | 4 | 80% | 1 |
| I would start a business in order to be the owner/at the top of company | 65% | 5 | 48% | 9 |
| I would start a business in order to create jobs | 63% | 7 | 59% | 6 |
| I would start a business in order to satisfy a need in a market | 73% | 3 | 66% | 5 |
| I would start a business in order to manage people | 30% | 11 | 15% | 12 |
| I would start a business in order to gain high social status | 43% | 10 | 38% | 10 |

Regarding the reasons that would stop them from starting their own businesses, there were slight differences among the two groups. For those who received an offline EE, their top reasons were "Lack of experience in management and finance", "Excessively risky£ and "Lack of legal assistance or counselling", while for those who received an online EE, their top reasons were "Excessively risky", "Lack of initial capital for start-up" and "Lack of legal assistance or counselling". It is interesting to note that both groups ranked "fear of failure" and "doubts about personal abilities" in a lower position compared to other reasons, indicating the positive impact EE had on them despite the mode of delivery, which complies with the findings of Al-Jubari et al. (2019).

**Table 4** Reasons why students would not start their own business

| *Item* | *Online* | | *Offline* | |
|---|---|---|---|---|
| | *Agree* | *Rank* | *Agree* | *Rank* |
| Lack of ideas regarding what business to start | 39% | 6 | 34% | 8 |
| Lack of assistance available to assess business viability | 43% | 5 | 44% | 6 |
| Lack of initial capital for start-up | 49% | 2 | 47% | 5 |
| Lack of legal assistance or counseling | 47% | 3 | 51% | 3 |
| Lack of knowledge of the business world and the market | 35% | 7 | 48% | 4 |
| Lack of experience in management and finance | 45% | 4 | 58% | 1 |
| Fear of failure | 33% | 8 | 39% | 7 |
| Doubts about personal abilities | 25% | 9 | 24% | 9 |
| Having to work too many hours | 24% | 10 | 20% | 10 |
| Lack of support from people around me (family, friends, etc.) | 16% | 11 | 19% | 11 |
| Excessively risky | 50% | 1 | 55% | 2 |

Students' perception of their entrepreneurship self-efficacy.

Self-efficacy refers to an individual's belief in his/her capability to perform tasks and roles aimed at entrepreneurial outcomes (Newman et al., 2019). Students were asked to rate their ability to start a business using Five-point scale evaluation (1. very poor; 2. below average; 3. average; 4. above average; 5. excellent). According to the results of the independent sample T-test, there is a difference in the means between the two groups, whereas the mean of those who received offline education was higher than those who received it online, indicating higher impact on the former group (Table 5).

**Table 5** Group statistics using T-test

| | | | | | |
|---|---|---|---|---|---|
| Self-efficacy | Offline | 121 | 10.8308 | 2.07908 | 0.21795 |
| | Online | 110 | 10.6374 | 1.98879 | 0.24668 |

Students who received an online EE showed confidence in their ability to start a business (Table 6), as 44% of them gave above average and excellent rating, but compared to those who received an offline EE, they are less confident. This result complies with the findings of Audet et al. (2018) that the students enrolled in the online section are

generally less successful in achieving the course's objectives, particularly competencies, skills, and attitudes.

**Table 6** Students' perception of their ability to start business

| | | *Mode of delivery?* | |
|---|---|---|---|
| | *Rating* | *Online* | *offline* |
| % within How would you rate your ability to start a business? | Poor | 56% | 44% |
| % within mode of delivery? | | 7% | 3% |
| % of Total | | 2% | 2% |
| % within How would you rate your ability to start a business? | Below average | 42% | 58% |
| % within mode of delivery? | | 14% | 11% |
| % of Total | | 5% | 7% |
| % within How would you rate your ability to start a business? | Average | 30% | 70% |
| % within mode of delivery? | | 37% | 50% |
| % of Total | | 13% | 32% |
| % within How would you rate your ability to start a business? | Above average | 41% | 59% |
| % within mode of delivery? | | 36% | 29% |
| % of Total | | 13% | 18% |
| % within How would you rate your ability to start a business? | Excellent | 36% | 64% |
| % within mode of delivery? | | 7% | 7% |
| % of Total | | 2% | 4% |

Moreover, students were asked to rate their entrepreneurial competencies after attending the course. Competencies refer to the knowledge and skills required to perform a specific job and it is changeable, learnable, and attainable though education (Volery et al., 2015). Students who have received online EE reported an improvement in their entrepreneurial competencies after attending the course, as 48% rated it as above average and excellent (Table 7), while 56% reported an improvement after attending an offline EE. Overall, students who received an offline entrepreneurship education were more successful in developing entrepreneurial competencies after attending the course compared to those who received it online (34% and 17%, respectively).

Students were asked about the degree to which entrepreneurship was being addressed within their courses (Table 8). Students who were receiving an online EE had better perception compared to those who received it offline, 70% of them reported that it was a great opportunity to learn about entrepreneurship and 70% of them as well felt that EE can broaden their career prospects, vs. 67% and 67%, respectively, for those who received it offline.

Moreover, 70% of those who received online education perceived entrepreneurship as a worthwhile career choice based on what they have studies during the semester, compared to 54% who received it offline. The researcher employed 'reverse wording' to ensure that students were not answering carelessly, and that no biases exist within their answers, Hence, two questions asked the students about their interest in the subject of entrepreneurship and taking entrepreneurship courses. However, the results students who

received the online entrepreneurship education had higher level of interest in entrepreneurship compared to those who received it offline.

**Table 7** Students' perception of improvement in their entrepreneurial competencies

| | *Rating* | *Mode of delivery?* | |
|---|---|---|---|
| | | *Online* | *Offline* |
| % within Overall, how would you rate your entrepreneurial competencies after attending the course? | Poor | 33% | 67% |
| % within mode of delivery? | | 3% | 3% |
| % of Total | | 1% | 2% |
| % within Overall, how would you rate your entrepreneurial competencies after attending the course? | Below average | 11% | 89% |
| % within mode of delivery? | | 1% | 6% |
| % of Total | | 0% | 4% |
| % within Overall, how would you rate your entrepreneurial knowledge after attending the course? | Average | 43% | 57% |
| % within mode of delivery? | | 48% | 37% |
| % of Total | | 17% | 23% |
| % within Overall, how would you rate your entrepreneurial competencies after attending the course? | Above average | 34% | 66% |
| % within mode of delivery? | | 36% | 40% |
| % of Total | | 13% | 25% |
| % within Overall, how would you rate your entrepreneurial competencies after attending the course? | Excellent | 33% | 67% |
| % within mode of delivery? | | 12% | 14% |
| % of Total | | 4% | 9% |

Students' perception of their entrepreneurship program.

**Table 8** Students' perception of their entrepreneurship program

| *Item* | *Online* | *offline* |
|---|---|---|
| | *Agree* | *Agree* |
| In general, in my faculty, students are encouraged to consider starting their own companies | 34% | 38% |
| In general, in my courses, entrepreneurship is presented as a worthwhile career option | 70% | 54% |
| I am not interested in taking entrepreneurship classes | 7% | 16% |
| Entrepreneurship education can broaden my career prospects and choices | 70% | 67% |
| I am not interested in the subject of entrepreneurship | 9% | 12% |
| It was a great opportunity to learn about entrepreneurship in my course(s) | 70% | 67% |

## 5 Conclusions, recommendations, limitations and future research

Entrepreneurship education has been acknowledged to have a positive contribution to the development of pupils' know-how, skills, as well as the enhancement of entrepreneurial attitude and intention. In Egypt, EE has been introduced as a mechanism to create entrepreneurially empowered individuals and combat the unemployment among youth. Due to the impact of COVID-19 pandemic, education process has been conducted using online platforms. While the debate of whether entrepreneurs are born or made, and the role EE plays in this. Is yet to be resolved, another debate arose which is, is online entrepreneurship education effective as the offline? This exploratory research was conducted to answer the question and hence provide further insights about the online entrepreneurship education. Despite the practical development of online and blended EE courses using the internet and educational tools, studies on educational technologies in EE have been limited. The underlying assumption is that digital technologies could leverage the way in which entrepreneurship process is introduced.

The results of this study show that students had positive view on entrepreneurship education, they believed that it broadens their career prospects and choice, improves their entrepreneurial competencies, and leverage their abilities to start a business. However, the majority do not expect to pursue entrepreneurial careers, rather they reported that they were most interested in working for a multinational/large size organisation after graduation. Considering the mode of delivery, students who received an online entrepreneurship education were less inclined towards starting their own businesses or work for a start-up than those who received it offline. They reported a development in their entrepreneurial self-efficacy through enhancement of their entrepreneurial abilities and competencies, however, they were less successful in doing this than those who received the offline education. It can be concluded that online entrepreneurship education has a positive impact, but it is less effective than offline entrepreneurship education in regard to producing the anticipated entrepreneurial outcome.

Considering the limited financial resources available to HEIs, it is recommended to reconsider their pedagogies (the method and practice of teaching), for example, rather than migrating to fully virtual education, they can incorporate the hybrid learning into their systems, hence overcoming the shortcomings of both online and offline entrepreneurship education. Some parts of entrepreneurship education cover topics such as elevator pitch, business plan development, etc. can be facilitated, to some extent, by the adoption of digital technologies as learners can be connected to practitioners and entrepreneurs to provide them with the advice and mentorship, that could not have been possible using offline methods.

In terms of research limitations, the survey tool used was based on an assessment tool that developed within the traditional delivery method (face to face), hence might not reflect the nature of the online delivery. Moreover, the survey has not been tested/piloted as it has been deployed quickly to make use of the rapidly evolving situation. The focus of research was on the recipients of the EE, but it did not take into consideration the other side of the equation, i.e., educators. Moreover, the shortage of previous research covering the online entrepreneurship education led to theoretically focus more on the EE in general regardless of the mode of delivery.

For future research, it is necessary to conduct the research among a larger sample and over multiple semesters, to identify the features and characteristics of the EE approaches assumed to develop the entrepreneurship competences while adopting the digital

technologies. Time is an important factor to be considered when tackling the entrepreneurial outcomes, hence it is recommended to consider it for future research. Since some literature advocate the role of educators in EE (for example, Bell and Bell, 2020; Kuckertz, 2013) it is deemed important to incorporate their opinion of and their experience with the online education process and compare it with the classroom experience.

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