THE IMPACT OF ENTREPRENEURSHIP EDUCATION ON COGNITIVE STYLE: THE CASE OF UNIVERSITY GRADUATES IN EGYPT

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ABSTRACT

Entrepreneurship education has been identified as one of the most critical factors in promoting entrepreneurship over the long run. Accordingly, it is now a main concern in most countries to implement diverse entrepreneurship education programs across universities. Cognitive style has been the center of attention among researchers and practitioners as an important factor in influencing entrepreneurial behavior. Researchers have grown curious on whether one's unique educational background could possibly assist in developing the cognitive style. Accordingly, it is of high interest to explore the role of entrepreneurship education in influencing the degree to which individuals are analytical or intuitive in their cognitive style and the possibility to integrate both into a balanced thinking style. Hence, this research aims to study the impact of formal academic entrepreneurship education on young Egyptian graduates' cognitive styles. The research design applied is a quasi-experimental post-test-only control group design through a structured survey. A comparative study was conducted between the test group; 333 graduates from private universities who were exposed to formal entrepreneurship major, while the control group is 461 graduates who were not exposed to any kind of entrepreneurship education. The findings signified the effective role of formal entrepreneurship education in promoting future entrepreneurs with effective and balanced entrepreneurial thinking as it was reported that the test group scored significantly higher than the control group on non-linear/intuitive thinking style and balanced thinking style. While the control group scored significantly higher than the test group on linear/analytical thinking style.

Keywords: Entrepreneurship Education, Cognitive Style, Quasi-experimental Design, Egypt.

INTRODUCTION

Entrepreneurship education is an important feature of the institutional context in which entrepreneurs are embedded to. It has been the center of attention and interest among researchers. This is because it is believed to play a vital role as it is a mechanism for educating and developing students for an entrepreneurial career and for equipping them with the necessary skills and competences to compete in a rapidly globalizing marketplace (Buli &Yesuf, 2015; Bakar et al., 2015). The latest advances in the field of institutions and entrepreneurship proposed that there are effective links between institutional antecedents and entrepreneurial cognitions, yet empirical testing that advocate this area of research has been lacking (Lim et al., 2010; La Belle, 1982). Therefore, this study continues this stream of research by empirically examining the role of institutional factors represented in entrepreneurship education in the development of entrepreneurial cognitions. Practically, this is important for policy makers and educators since they need to see the impact of entrepreneurship education on stimulating the entrepreneurial

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career, hence increasing the entrepreneurial activity. This is to justify the investments done to promote entrepreneurship education (Walter & Block, 2016).

During the past decade, the cognitive theory has played a key role in explaining entrepreneurship. This is because the cognitive perspective highlighted the significance of the mind and enhanced the understanding of how to think entrepreneurially which subsequently affect entrepreneurial actions (Ahmad et al., 2014). The cognitive style which stems from the field of individual differences psychology has been the center of attention and interest among researchers and practitioners in organizational behavior in general and specifically in the innovation and entrepreneurship field (Armstrong & Hird, 2009). This is because cognitive style is commonly identified as a main factor of individual behavior as it influences the individuals' preferences towards various types of learning as well as the way they gather and process information, solve problems and make decisions. Therefore, it may affect peoples' choices. Consequently, this explains the importance of cognitive style in the context of entrepreneurship as it generally affects many key behaviors that entrepreneurs face daily (Kickul et al., 2009; Barbosa et al., 2008; Armstrong & Hird, 2009; Krueger & Day, 2010). Even though, cognitive style research has received considerable attention during the past 40 years in business and management research in general, it is still under-researched; there is a need to open up new areas of research where empirical contributions are more evident and given much attention to achieve balance as there is proportionately more theoretical research than the empirical one (Armstrong et al., 2012).

What has been done so far in entrepreneurship education studies has yielded great results. Yet, it is believed that entrepreneurship research should start to focus on studying how to stimulate entrepreneurial thinking (Neck & Greene, 2011). This is because it is emphasized that thinking is considered a key element of entrepreneurial behavior as entrepreneurs usually operate in an environment characterized by high uncertainty and make decisions with incomplete or vague information (Barbosa et al., 2008). This has given rise to a fertile and productive research field in entrepreneurship literature known as entrepreneurial cognition. Consistently, Nabi et al., (2017) stated that there is an urge need to explore empirically new promising future research directions that are considered underemphasized such as studying the impact of university-based entrepreneurship education on one's thinking style. This is because the learning processes can modify deep mental processes for more effective entrepreneurial thinking. This clearly proposes that measures of deep processes can be usefully adopted to study how thinking style would change after an entrepreneurship educational program as potential entrepreneurs learn to have a more entrepreneurial mindset (Gregoire et al., 2011; Krueger & Day, 2010).

More specifically, the cognitive psychology field has been recognized to be very useful to evaluators who want to measure and maximize the effectiveness of entrepreneurship education (Krueger, 2017). From a cognitive perspective, the development of Non-Linear (intuitive), Linear (analytic) and balanced thinking styles should be assessed, because these styles tend to contribute significantly to the entrepreneurial process by enhancing opportunity identification and planning effectiveness (Vance et al., 2012; Barbosa et al., 2008). Accordingly, developing and stimulating both intuitive and analytic thinking styles seems to be essential to the effectiveness of entrepreneurship education.

The prevailing mode of research in entrepreneurship cognition has been focusing on the impact and consequences that cognitive variables have on relevant outcomes. Nevertheless, very few researchers studied the origins and development of these cognitive variables. That is why, the nature and source behind the cognitive differences between entrepreneurs and non-

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entrepreneurs remains vague and ambiguous. Researchers need to give more attention and consideration to the antecedents that may have an impact on developing one's cognitive style (Gregoire et al., 2011). Moreover, many scholars and practitioners coming from diverse fields emphasized on the need to understand how entrepreneurship education could influence one's entrepreneurial thinking. Therefore, there seems to be a gap and little knowledge in this area (Nabi et al., 2017; Gregoire et al., 2011; Vance et al., 2012; Groves et al., 2011).

There is an unemployment problem that faces most developing countries. That is why, entrepreneurship education has received more attention specifically through training and formal educational systems. Therefore, there is an urge need to maximize the effectiveness of formal academic entrepreneurship education to educate and train youth to have an entrepreneurial mindset to make the entrepreneurial career an attractive option for them. This will subsequently impact the economic efficiency and help in introducing innovation to the marketplace as well as creating new jobs that will contribute to solving the unemployment problem (Hattab, 2014; Kirby & Ibrahim, 2011; Rae & Carswell, 2001; Bayron, 2013).

This research paper is grounded primarily on Human Capital Theory (Mincer, 1958; Becker, 1964) which predicts that individuals or groups who invest more in their human capital will possess greater levels of knowledge, skills and other competencies which will yield greater performance outcomes compared to those possessing lower levels. An important common measure of Human capital includes education and training which is considered a key source of human capital differences (Martin et al., 2013).

This research aims to study the the impact of Formal academic Entrepreneurship Education on cognitive style of young graduates. This study contributes to extending the knowledge of the potential impact of formal entrepreneurship education programs on young graduates' thinking styles since most researchers in the literature have focused on exploring the impact of entrepreneurship education programs on the common antecedents of entrepreneurial intentions such as self-efficacy, personal attitude, and subjective norms (Barbosa et al., 2008).

Entrepreneurship Education and Cognitive Style

Chen et al. (2010) refers to entrepreneurial education as *"a kind of educational thinking and educational practice with the purpose of cultivating students' awareness of entrepreneurship, spirit of entrepreneurship and capacity of entrepreneurship to strengthen their entrepreneurship quality as to tap their own potentials, cultivate their diligent, pioneering and innovative personality and intensify their employment competitiveness."* Moreover, Allinson et al. (2000) stated that cognitive style could be seen as *"a person's preferred way of gathering, processing and evaluating information"* that relates to creativity, problem-solving and decision making (Groves et al., 2011). An individual's cognitive style may intentionally vary according to the unique constraints and conditions of a given situation (Groves et al., 2011). Individuals' cognitive styles are classified as follows, people who have a "*Linear*" (analytical) style tend to look for facts and data, task-oriented and accurate and come up with clear and rational solution. While Individuals who have a "*Non-linear*" (intuitive) style adopt a holistic and conceptual thinking, creative and enjoy experimentation, uncertainty and freedom. While Individuals who have a "*Balanced*" style have a great versatility in using either linear or non-linear thinking depending on the situation at hand and on the various entrepreneurial and functional requirements needed for venture creation (Groves et al., 2011; Allinson & Hayes, 1996).

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Despite of the prevalent widespread intuitive stereotype that entrepreneurs have a right brain thinking preference and are perceived as being primarily creative, it is obvious that both intuitive and analytical ways of thinking complement each other and are both needed to cultivate and stimulate the entrepreneurial capability (Groves et al., 2011). This is because Olson & Bosserman (1984) proposed that different thinking styles to information processing are believed to be related to different phases of the entrepreneurial process. They stated that intuitive thinking will be more effective in early stages of the entrepreneurial life cycle while the analytical thinking will be more effective in later stages of the entrepreneurial life cycle. For example, when entrepreneurs are involved in exploiting new opportunities and gathering information from multiple sources to develop new products, services or new applications, they tend to think in a prevailing intuitive way. On the other hand, when they are involved in assessing these market opportunities, developing financial, marketing, production and distribution plans, implementing and managing the new venture, entrepreneurs would process information in a prevailing analytical, rational and linear manner as they focus more on details and facts. Thus, this highlights the importance of balanced thinking style throughout the entrepreneurial process (Olson & Bosserman, 1984).

Accordingly, the GEI (2009) reported that there is an urge demand coming from business school entrepreneurship educators asking for a major change and calling for a paradigm shift targeting all educators to adopt whole brain techniques to develop both right brain intuitive thinking as well as the left-brain analytical thinking (Kirby & Ibrahim, 2011; Penaluna et al., 2010; Groves et al., 2011). However, one of the major challenges facing most education systems in general and specifically business schools is how to come up with a learning and an evaluation system that balance both traditional and entrepreneurial styles to be able to develop students who have the capability to think both intuitively and rationally, what is called the "*balanced brain*" (Kirby & Ibrahim, 2011; Sadler-Smith, 2004).

Within the organizational and educational context, there is an obvious lack of incorporation of both linear and non-linear thinking styles either in companies or in educational curriculums. Several researchers emphasized the importance of utilizing both intuitive and rational thinking for information processing and decision making. As quoted by Senge (1990) that *"we have a very long way to go, in our organizations and society, toward reintegrating intuition and rationality".* Accordingly, one of the valuable objectives of business and entrepreneurship educators is to help students develop a balanced thinking style. This is because measuring the degree of thinking style balance after educational programs would help in providing relevant information to design, implement and assess instructional and developmental methods for the sake of enhancing thinking-style balance (Vance et al., 2007). Therefore, it is of high importance to measure the effectiveness of entrepreneurship education programs by examining its potential impact on promoting prospect/ future entrepreneurs with effective and balanced entrepreneurial thinking.

Since the time of ancient Greeks, the main aim of most formal education systems was to employ left-brain learning methods to develop student's analytical competencies. Instead of encouraging creative and intuitive entrepreneurial thinking style, which is function of the right brain, the main focus of education systems was more on stimulating the critical and analytical thinking style which represents the left brain suppressing the various approaches that can be adopted to create an open and curious environment in the classroom, to train and educate people to think in a creative and lateral manner (Kirby & Ibrahim, 2011). Recently, there is a recognized effort done by several universities to design and develop curriculums in entrepreneurship and

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business education that intend to stimulate student's creativity and their intuitive thinking such as Babson College's School of Business and the Cranfield School of Management (Vance et al., 2012). Moreover, Boyatzis et al. (2002) have presented findings based on a 50-year longitudinal study on a master's program in business administration taught at Western Reserve University. They reported that the program had a significant impact on student's thinking styles as after the program students were found to develop both cognitive intelligence competencies that represents linear thinking and emotional intelligence competencies that represent non-linear thinking.

Also, Singh (2008) stated that corporations value students who are graduated from an entrepreneurship major as they are more capable of thinking across functions and embracing a general perspective of the firm as a whole. Accordingly, Charney & Libecap, (2000) found out empirically that the impact of entrepreneurial education is not only restricted to starting up new ventures or becoming self-employed, but also it significantly affects established organizations indirectly as students who are exposed to entrepreneurial education are found to be more successful than their non-entrepreneurial counterparts even if they decided to pursue a more traditional career path. In general, entrepreneurial graduates were found to have higher probability of being hired in high growth companies or being involved in vital strategic tasks such as the development of new products than their non-entrepreneurial counterparts due to their agility in thinking style.

Furthermore, Groves et al. (2011) found that educational background was found to be correlated to thinking style balance as results showed that education contributes to one's versatility in using both linear (analytical) and nonlinear (intuitive) thinking styles. Moreover, the findings proposed that successful entrepreneurs will probably have a balanced thinking style profile and advanced education may impact the development of such cognitive versatility. Such cognitive versatility and flexibility is necessary and is considered a new arena of study that future researchers should focus on (Groves et al., 2011). Moreover, in 2012, Vance, Groves, Gale & Hess proved that senior business students who were exposed to courses that emphasize non-linear activities scored significantly higher compared to their freshmen counterparts on thinking style balance which in return could promote successful entrepreneurship. Finally, the previous findings provide empirical evidence that thinking style balance should be an assessment/measurement of success to improve the effectiveness of education in attaining desired learning outcomes.

Past studies were trying to find a link between students' learning styles and their discipline of study. It is worth mentioning that cognitive style is often considered to be the predecessor of learning style (Sadler-Smith, 2001; Riding, 2001). Kolb, (1976) empirically found on a sample of business managers; American postgraduate management students that their learning styles were correlated to their undergraduate majors. In a similar manner, Nulty & Barrett (1996) were trying to examine whether the discipline of study would affect student's learning styles. They studied the learning styles of university students in their first three years of their study as well as students in different disciplines in their last senior year on a sample of 674 students. The findings indicated that students in their first three years of studies share similar learning styles. However, learning styles of senior students tended to be related to their disciplines/majors that presented the primary focus of their studies. A logical explanation is that students in their first three years of university share the same educational experience that is why they were homogeneous in their learning styles unlike senior students who had heterogeneous learning styles as they were enrolled in different disciplines. The previous findings support the

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claim that one's learning style is flexible and could be influenced by education even over the short-term (Hayes & Allinson, 1997; Ismail et al., 2017; Zhang & Sachs, 1997).

Finally, Vance et al. (2007) found that students who are enrolled in accounting, finance majors and engineering courses that represent a quantitative nature have a higher preference for linear thinking than those who are enrolled in qualitative nature majors such as marketing and international business who prefer a more non-linear thinking.

One fruitful and valuable area that forthcoming research should explore is how one's unique educational background influence the development of his/her own cognitive style as a possible link between one's educational background and his/her thinking style is suggested (Gregoire et al., 2011). Although, many scholars and practitioners coming from diverse fields emphasized on the need to understand how entrepreneurship education could influence one's entrepreneurial thinking, few studies examined the impact of entrepreneurship education on one's cognitive style. Therefore, there seems to be a gap and little knowledge in this area (Nabi et al., 2017; Gregoire et al., 2011; Vance et al., 2012; Groves et al., 2011). Furthermore, thinking style balance is considered a new notion that future researchers should focus on to advance the entrepreneurial cognition field as it has been empirically tested on a very limited basis (Groves et al., 2011; Barbosa et al., 2008). Based on the above discussion, the research question and hypotheses are as follows:

"RQ: What is the impact of Formal Entrepreneurship education on cognitive style?"

H_1: *It is proposed that students graduated from an Innovation and Entrepreneurship major will achieve higher scores in balanced thinking style compared to those graduated from other majors (control group).*

H_2: *It is proposed that students graduated from an Innovation and Entrepreneurship major will achieve higher scores in non-linear thinking style compared to those graduated from other majors (control group).*

H_3: *It is proposed that students graduated from an Innovation and Entrepreneurship major will achieve lower scores in linear thinking style compared to those graduated from other majors (control group).*

METHOD`

The experimental design applied in this research is a "*quasi-experimental post-test-only control group design*" through a structured questionnaire/survey (i.e., with closed questions). This is an experimental design where the test group is exposed to "*treatment*" while the other group is controlled. In this research the test group is young graduates from private universities who were exposed to formal entrepreneurship major, while the control group is graduates from other majors who were not exposed to any kind of entrepreneurship education. This is to address how entrepreneurship education would impact their cognitive styles. Hence, this will enhance the understanding concerning the effectiveness of formal entrepreneurship education in private universities in Egypt to potentially produce valuable insights for the development and identification of prospect entrepreneurs. The chosen research design had been widely adopted in various studies attempting to test the usefulness of entrepreneurship education by assessing its potential impact (Nitu-Antonie & Feder, 2015; Rauch & Hulsink, 2015).

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Sample and Procedure

The survey sample consisted of 836 surveys of which 794 (566 via drop off technique and 228 via online technique) were complete and usable classified as 333 University graduates exposed to formal entrepreneurship education (test group), and 461 University graduates who were not exposed to any kind of entrepreneurship education (control group). The target sample fall within five years of graduation (2015-2019), their ages range from 20 till 26 years old. The males represented 30% of the sample while 70% of the sample was females. Moreover, graduates who majored Innovation and Entrepreneurship represent 38.5% of the sample while 61.5% of the sample graduated from different majors such as accounting, finance, marketing, human resource, strategic management and economics. Regarding their employment status, 42.7% of the sample was unemployed as they were fresh graduates, whereas 32.8% of the sample was employed in a salaried work. Furthermore, only three private universities in Egypt have major/concentration in Innovation and entrepreneurship in their academic catalogue, thus they were included in this present research, and they are German University in Cairo (GUC), British University in Egypt (BUE) and Nile University (NU). Concerning the sampling technique, non-probability judgmental/purposive sampling which is a form of convenience sampling was used meaning that the researcher selects a certain sample of the population based on who he/she thinks would be appropriate for the study. The selection is based on the researcher's judgment and expertise in choosing the elements to be included in the sample (Malhotra, 2010).

The questionnaire was distributed among the respondents over a period of one year. It was distributed in June 2018 till the end of June 2019. The researcher depended on three main methods for data collection, and they are online technique, physical presence in universities and personal networks/contacts. It is worth mentioning that participants were informed that participation in the study is entirely voluntary, and confidentiality was guaranteed.

Instrument

The scale adopted in this research is the Linear Nonlinear Thinking Style Profile (LNTSP) developed by Vance et al. (2007). It is a 26-item, four-dimensional, forced-choice self-report measure of decision- making style. The LNTSP scale is comprised of two sets of paired forced-choice items. Respondents were asked to voluntarily self-assess their thinking style preferences based on a four-point scale. The first set of forced-choice items includes five pairs of statements that describe alternative behaviours during decision making (10 total items); five items measuring Linear Decision-Making (LDM) and corresponding five items measuring Nonlinear Decision-Making (NDM). Respondents were asked to allocate exactly three points across each pair of statements according to how frequently they behave during decision making on a Likert type scale (0=rarely or never, 1=occasionally, 2=moderately often, 3=very often). An illustration of a pair of statement is "*I primarily rely on logic when making career decisions*" and "*I primarily rely on feelings when making career decisions*".

The second set of forced-choice items include eight pairs of words or phrases that influence and guide individual's decision making and behaviour (16 total items); eight items measuring External Information Sources (EIS) and corresponding eight items measuring Internal Information Sources (IIS). Respondents were asked to allocate exactly three points across each pair of words to indicate the impact of these sources on their decision-making process on a Likert

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type scale (0=little or no influence on how I behave, 1= moderate influence on how I behave, 2= strong influence on how I behave often, 3=very strong influence on how I behave). Examples of pairs include "*feelings*" and "*facts*", "*deduction*" and "*intuition*", "*inner knowing*" and "*logic*". The linear thinking style dimension score is the sum score of EIS and LDM, while the nonlinear thinking style dimension score is the sum score of IIS and NDM. Whereas the thinking style balance score has been calculated in past research as the absolute value of the difference between total linear and total nonlinear scores; the lower the score, the greater/higher the balance (Vance et al., 2007).

Formal Entrepreneurship Education was simply measured by asking participants a dichotomous question whether they were graduated from Innovation and entrepreneurship major, yes was coded as 0 and no was coded as 1 for purposes of analysis. The last part of the questionnaire requested the respondents to fill in demographic information. The questions included gender, age, year of graduation, university graduated from, their major, their current employment status and their parents' occupation.

RESULTS

Before conducting the data analysis, confirmatory factor analysis (CFA) for LNTSP scale was carried out to measure the validity of the scale. According to table 1, the goodness of fit indices shows acceptable and satisfactory validity of the LNTSP scale. The CHI standardized is 2.271 which is within the acceptable baseline. Moreover, all values of the six indices; Goodness of Fit Index, Normed Fit Index, Relative Fit Index, Incremental Fit Indexes, Tucker-Lewis Index, Comparative Fit Index are greater than 0.90, thus within the acceptable baseline as well. Additionally, the values of Root Mean Square Residual and Root Mean Square Residual Error Approximation are below 0.08 which is acceptable and indicates a very good fit of the model.

Table 1
THE GOODNESS OF FIT INDICES FOR LNTSP SCALE

	CMIN/DF	GFI	NFI	RFI	IFI	TLI	CFI	RMR	RMSEA
Required threshold	< 3.0	>.90	>.90	>.90	>.90	>.90	>.90	<.08	<.08
LNTSP Scale	2.271	0.975	0.930	0.916	0.960	0.951	0.959	0.020	0.038

Additionally, testing the reliability of the Linear Nonlinear Thinking Style Profile scale was conducted. In this study, the reliability of the scale was measured via the internal consistency. The internal reliability of the scale has been tested by the Cronbach's alpha. The acceptable value for Cronbach alpha that indicates satisfactory and acceptable internal reliability is 0.7 and above (Pallant, 2007). Reliabilities for the scale reported sufficient and satisfactory Cronbach's alpha scores (> 0.7). According to the below table the Cronbach's alpha scores of the Linear thinking style, Non-Linear thinking style were as follows α=0.796, α=0.796 respectively. Also, the scale has shown adequate intrinsic validity as well. The intrinsic validity is calculated by the root square of the reliability coefficient. Another method was applied to test the reliability

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of the scale using Structure Equation Modeling (SEM) which is the Composite Reliability (CR). Composite reliability is intended to measure the internal consistency of the scale as well. The Composite Reliability scores of the scale have reported satisfactory and acceptable values (> 0.7) (Hair et al., 2014).

Table 2
RELIABILITY FOR LNTSP SCALE

Dimension	Number of Items	Reliability Coefficient α	Intrinsic Validity	Composite Reliability (CR)
Linear (Analytical) Thinking style	13	0.796	0.892	0.87
Non-Linear (Intuitive) Thinking style	13	0.796	0.892	0.87

T-Test analysis is commonly applied in research to assess the significant difference between two groups on one dependent variable (Hair et al., 2014). T-Test is conducted in this study to test the impact of formal entrepreneurship education on university graduates' cognitive style. The significance level applied in the t-test is equal to or less than 0.05. If the p-value is above 0.05, then there is no significant difference between the two groups on the dependent variable (Pallant, 2007). The respondents were divided into two groups. The first group is the test group; graduates who were exposed to formal entrepreneurship education (i.e., Entrepreneurship major). The second group is the control group; graduates who were not exposed to any kind of entrepreneurship education. This categorical question was tested along with the research variable; cognitive style through independent-test.

As shown in Table 3, the results showed that there is a significant difference in scores between graduates who were exposed to formal entrepreneurship education and those who were not exposed to any kind of entrepreneurship education on linear, non-Linear and balanced thinking styles at a significance level of ($P<0.01$). It was revealed that graduates exposed to formal entrepreneurship major ($M=20.8709$, $SD=5.28394$) score lower than graduates not exposed to any kind of entrepreneurship education ($M=22.0738$, $SD=5.60231$) on the linear (analytical) thinking style factor. Also, it was shown that graduates exposed to formal entrepreneurship major ($M=18.1291$, $SD=5.28394$) score higher than graduates not exposed to any kind of entrepreneurship education ($M=22.0738$, $SD=5.60231$) on the non-linear (intuitive) thinking style factor. Additionally, graduates exposed to formal entrepreneurship major scored higher ($M=2.7417$, $SD=10.56788$) than graduates not exposed to any kind of entrepreneurship education ($M=5.1475$, $SD=11.20462$) on balanced thinking style factor as the lower the score, the greater/higher the balance. Therefore, all three hypotheses were supported.

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Table 3
T-TEST: TEST AND CONTROL GROUPS COMPARISON ACROSS COGNITIVE STYLE

Variable	Sample (n)	Mean	Std. Deviation	T- test	P_value
Linear (Analytical) Thinking	Test Group (n=333)	20.8709	5.28394	-3.057	.002**
	Control Group (n=461)	22.0738	5.60231		
Non-Linear (Intuitive) Thinking	Test Group (n=333)	18.1291	5.28394	3.057	.002**
	Control Group (n=461)	16.9262	5.60231		
Balanced Thinking	Test Group (n=333)	2.7417	10.56788	-3.057	.002**
	Control Group (n=461)	5.1475	11.20462		
**p<0.01					

DISCUSSION

The previous finding emphasized the effectiveness of formal entrepreneurship education in stimulating Egyptian graduates' thinking style balance. As formal entrepreneurship education was found to significantly impact thinking style balance among young graduates in Egypt. In other words, formal entrepreneurship education was found to be highly correlated to thinking style balance. The previous findings indicate that Entrepreneurship major offered at three private universities in Egypt educate/teach students to think in a creative and analytical manner to help them develop their cognitive style versatility which in return encourages entrepreneurial thinking. This is because the major incorporates activities that embrace both linear and non-linear thinking styles in their educational curriculums. This contradicts with the criticism subjected to entrepreneurship educators for over relying on encouraging the functional skills to start up a business at the expense of promoting creativity and innovation. The study's findings are consistent with the literature review since Groves et al., (2011) found that successful entrepreneurs have a balanced thinking style profile and advanced education may positively impact the development of such cognitive versatility. Moreover, Vance et al. (2012) found that senior business students who were exposed to courses that emphasize non-linear activities scored significantly higher compared to their freshmen counterparts on thinking style balance which in return could promote successful entrepreneurship. In a consistent manner, Kirby & Ibrahim, (2011) found that senior students who were subjected to formal entrepreneurship education have versatility in their thinking style. Furthermore, Charney & Libecap, (2000) found out that students who are exposed to entrepreneurial education are found to be more successful than their non-entrepreneurial counterparts as they are more capable of thinking across functions and embracing a general perspective of the firm as a whole.

Since entrepreneurship scholars have emphasized the urge need to adopt new impact indicators of university-based entrepreneurship education such as one's cognitive style (Nabi et al., 2017), this study was able to extend the knowledge of the potential impact of formal entrepreneurship education programs on young graduates' thinking styles. Most researchers in the literature have focused on exploring the impact of entrepreneurship education programs on the common antecedents of entrepreneurial intentions such as self-efficacy, personal attitude and subjective norms (Ajzen, 1991). To the best of the researcher's knowledge, this is the first study

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to explore the direct impact of formal entrepreneurship education on young graduates' cognitive styles. This research verified the role of formal entrepreneurship education in successfully promoting future entrepreneurs with effective entrepreneurial/versatile thinking which subsequently could affect their entrepreneurial behavior positively. Therefore, this research contributes to the literature on how to stimulate entrepreneurial thinking among under/postgraduates by proposing an effective link between entrepreneurship education and thinking style balance. It is quite clear that this study mainly focuses on assessing the impact of only one type of entrepreneurship education program which is the formal academic type. Accordingly, it would be quite interesting to test the potential impact of non-formal entrepreneurship education programs on individual's cognitive styles in the future. Also, it would be valuable to explore how individuals' cognitive styles would affect their intentions to start up their own businesses.

Moreover, the nature of individuals' cognitive style whether it is a flexible or stable construct has been a debatable issue in the literature review and of particular interest to researchers. However, very few researchers studied the flexibility of cognitive style in terms of exploring factors that may influence the development of one's cognitive style (Gregoire, et al., 2011; Pithers, 2002). Accordingly, this research extends our knowledge with respect to the malleable nature of individuals' cognitive style that was found to be subject to change. Based on the above contribution, this could inspire and open new research directions such as adopting new impact indicators in testing the effectiveness of entrepreneurship education programs such as one's mindset or emotions. Also, another promising research direction that could be explored in future entrepreneurship research is uncovering other factors that may have significant impact on shaping and influencing individuals' cognitive styles such as parenting or culture.

Furthermore, most of the entrepreneurship research done in the literature mainly focuses on the contexts of developed countries more than developing ones, that is why research in the area of entrepreneurship in developing countries is considered at formative stage (Hattab, 2014). This study fulfils the gap and provides insights into the potential impact of formal entrepreneurship education programs offered at the three well-known private universities in Egypt. It is worth mentioning that this is the first attempt to study the impact of Innovation and Entrepreneurship major across three private universities in Egypt. It is quite evident that the field of entrepreneurship is practical in nature. In this sense, a better understanding of the potential impact of formal entrepreneurship education on young graduates' cognitive style is imperative on the practical level. Accordingly, this research provides several promising avenues for practical implications for various stakeholders.

There is an urge need that educators give more attention to promote formal entrepreneurship education and integrate it in all public and private educational institutions starting from the school level till post-graduate level, especially that only three universities in Egypt were found to have Entrepreneurship major/concentration in their academic catalogue program.

Moreover, cognitive style was empirically found to be subject to modifications, then the development of educational and training programs or modification of current business school curricula in the academic setting is critical. The overemphasis of analytical left-brain side style of business education is not suitable with the dynamic complex nature of entrepreneurship and may contribute to ineffective entrepreneurial thinking and decision-making. Intuition has to play an important role in teaching entrepreneurship and business. Entrepreneurship and business educators in universities should strive to develop a curriculum that endorse versatility by

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developing students' intuitive and rational thinking and design an evaluation system that recognizes both styles as well. This is to encourage students to have a versatile and entrepreneurial thinking style. This is significantly important in Egypt since the current educational culture still encourages somehow the idea of being hired in safe corporate or government jobs. Finally, assessing versatility in thinking style after educational programs would help in providing relevant information to design, implement and assess instructional and developmental approaches for the sake of enhancing thinking-style balance.

Also, policy makers need to invest more in promoting formal entrepreneurship education among public and private Universities. This is especially important for a developing country like Egypt where the need for entrepreneurial development is high. Therefore, it is vital to allocate the resources efficiently where the returns on investment could be foreseen. Moreover, policy makers should design and impose relevant policies and frameworks to regulate the implementation of formal entrepreneurship education in all educational institutions, so that, entrepreneurship education would have an important role in the future accreditation process. There is an urge need to spread the entrepreneurial culture in Egypt by investing in entrepreneurship education that has a key role in developing new potential entrepreneurs.

Moreover, more initiatives must be made by public and private universities to promote formal entrepreneurship education not only among business students but also across different faculties (i.e., major, minor, electives, projects……. etc.). Universities in Egypt should have a more important role in encouraging entrepreneurial behavior by creating an entrepreneurial environment where students learn how to think and behave entrepreneurially which makes them realize their full potentials and capabilities, hence being promoters of change and excelling in today's highly competitive business environment. In addition to that, this research could potentially provide practical insights for employers as well. This research suggests that the educational background should be examined as part of the process of analyzing applicants' thinking style, innovative intentions and decision behaviours. This could serve as a very useful guide for selecting those who could actively be involved in vital strategic tasks such as the development of new products or services. Furthermore, this research could be valuable to venture capitalists and financial/investment institutions as this study suggests that the educational background of potential entrepreneurs should be checked as part of the process of analyzing their thinking style which could subsequently guide them for better investment decisions.

Finally, this research could be valuable to the government as well. This is because the government should have a critical role in promoting entrepreneurial behaviour among youth especially that Egypt's scores with regard to entrepreneurial intents are among the highest globally which demonstrates strong entrepreneurial aspirations, particularly among youth (Global Entrepreneurship Monitor, 2018). Therefore, there should be serious initiatives done by the government to translate these aspirations into actual start-ups by expanding entrepreneurial education and awareness among youth through the formal and non-formal educational systems in public and private universities, massive open online courses that are highly convenient for younger generations nowadays and finally mass media awareness and social media campaigns to positively promote entrepreneurship in the society.

CONCLUSION

Entrepreneurship is considered one of the most essential drivers contributing to the economic development across the globe. Accordingly, entrepreneurship education has been the

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centre of attention and interest among researchers. This is because it is believed to play a vital role in educating and developing students with a versatile and entrepreneurial thinking style and for equipping them with the necessary skills and competences to start up their own businesses and compete in a rapidly globalizing marketplace. These research findings supported the positive role of formal entrepreneurship education in fostering future entrepreneurs with balanced entrepreneurial thinking as the results found that the test group scored significantly higher than the control group on thinking style balance. This research effort contributed theoretically to the field of entrepreneurship education and cognition by enhancing one understands regarding the impact of formal entrepreneurship education on one's cognitive style. Moreover, this research provided several promising avenues of practical implications for various stakeholders such as educators, policy makers, universities, and the government.

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