

# FACTORS AFFECTING THE ENTREPRENEURIAL EDUCATION INTENTION OF CAIRO UNIVERSITY'S SCIENCE STUDENTS: A CASE STUDY

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## ABSTRACT

*In Egypt—similar to other developing countries around the world—the role universities play has become increasingly important to national economies when considering the source of trained and qualified workers for sustainable national growth. Today, Egyptian universities have reinvented education in entrepreneurship in terms of how graduates should be prepared for the workforce by focusing on job security, the demands of a rapidly evolving society, employment security, and technological changes, in addition to the willingness of students to pursue entrepreneurial careers at new companies of creative private and public sector organizations. Cairo University has implemented teaching entrepreneurship courses to all 25 of its faculties as a mandatory form of entrepreneurship education to cultivate entrepreneurial mindsets. The present work aims to study the effects of behavioral factors of the theory of planned behavior (TPB) and psychological trait factors on students' entrepreneurial intention by measuring the effects and circumstances under which the effects are observed, as well as to investigate and examine the effects of both behavior and traits elements. A questionnaire was prepared based on previous studies and was introduced to a selected sample of Cairo University students. Three hundred students, selected from four undergraduate stages and three post-graduate levels of the Faculty of Science at Cairo University, were considered, and the resulting data were analyzed using an analysis of a moment structure (AMOS) through structural equation modeling (SEM) to examine the effect of behavior and traits.*

*The findings revealed a positive relationship between social factors, while no relation existed between entrepreneurial intentions and current education and university life. The results showed that there was quite a different effect on attitudes toward behavior with students' entrepreneurial intention, while, on the other hand, there was also a specific effect of traits. Additionally, the findings revealed a positive relationship between social factors, while no relation existed between entrepreneurial intentions and current education and university life.*

**Keywords:** Faculty of Science, Cairo University, Entrepreneurship Education, Entrepreneurial Intention, Theory of Planned Behavior, Student Entrepreneurship.

## INTRODUCTION

Entrepreneurship has been progressively recognized as a vital generator of growth, innovation, and, in particular, new job creation. As a result, there has been an increased number of tutorials and political and company interest in entrepreneurship enhancement. The importance of entrepreneurship education has been exaggerated due to the demand to prepare students to deal with an up-to-date workforce and to adapt to living settings, along with the entrepreneurship courses taught to business students. This paper aims to advance an understanding of the impact

of behavioral and psychological factors that influence entrepreneurial intention (EI) to encourage small business projects for Cairo University students. The study has several objectives that aim 1) to distinguish to what extent the chosen variables (i.e., attitudes toward being a business person, perceived behavioral management, subjective norms and social valuation, propensity to require risk, self-confidence, desire for accomplishment, tolerance for ambiguity, originality, locus of control) correlate to students' EI; and 2) to explore out of those variables which will be the best predictors of students' business–personal intention to become an entrepreneur. Entrepreneurship education has been considered one of the key instruments used to increase the entrepreneurial attitudes of both potential and nascent entrepreneurs. The number of both public and private initiatives to train and educate students to be more entrepreneurial has multiplied at universities worldwide. Entrepreneurship education programs respond to the increasing interest from students about entrepreneurial careers (Brenner et al., 1991; Hart & Harrison, 1992; Fleming, 1994; Kolvereid, 1996a). In addition, there is an increasing awareness of public authorities regarding the importance of entrepreneurship as a contributor to economic development (Hytti & Kuopusjarvi, 2004).

The objective of this study is to explore which elements play the most influential role in shaping the personal decision to start a firm and to design improved entrepreneurship education initiatives. Personal attitudes and perceived behavioral control are the most relevant factors that explain EIs. The entrepreneurial intention questionnaire (EIQ) could be used as an evaluation instrument for entrepreneurial education programs.

The empirical analysis is based on two essential elements: an already validated instrument (EIQ) and a statistical method (factor-regression procedure) that is not dependent on any theoretical approach.

The role of entrepreneurship education is considered a key instrument in increasing the entrepreneurial attitudes of people (Potter, 2008). Thus, educational initiatives have been considered highly promising in their ability to increase the supply of potential entrepreneurs (that is to say, more people becoming aware of and interested in this career option) and nascent entrepreneurs (more people attempting to start a new venture).

Therefore, there is a need to clarify which elements play the most influential role in shaping the personal decision to start a firm. This will allow the design of more effective education initiatives. We use entrepreneurial intention as the dependent variable because intention is considered the single best predictor of behavior.

### **Participants and Location of the Study**

Universities have the ability to design and develop curricula that meet the demands of students as well as the needs of ever-evolving industries. They offer various qualifications, such as higher national diplomas, bachelor's degrees, honors programs, and post-graduate programs (Zegeye, 2013). The group of DUT students from the first level up to the post-graduate level formed the sample. These participants were drawn from the Faculty of Science. The students at the first level were not excluded, even though they only had 7 months of university education experience at the time of data collection. Therefore, second- and third-year students who were halfway through the completion of their debut qualifications were chosen. It is believed that by the time of data collection they would have received in-depth exposure to university education as well as the university environment.

## **RESEARCH DESIGN AND METHODS**

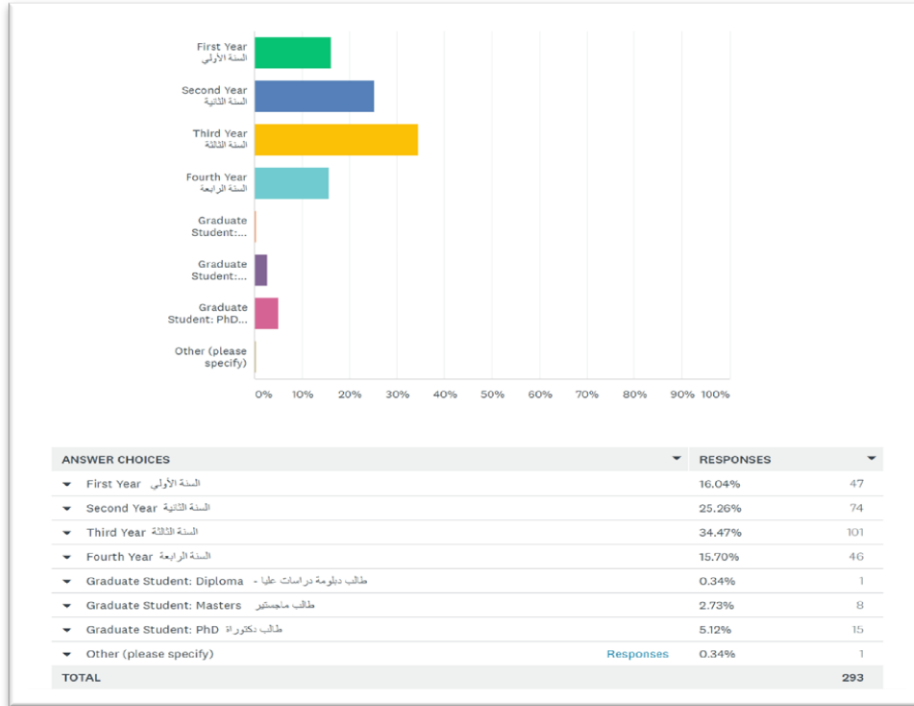
This study employs a descriptive cross-sectional approach because it describes an existing phenomenon, and the researcher is seeking to better describe existing situations by investigating relevant factors. The quantitative method has been identified as the most suitable because it draws a large and representative sample from the target students.

A generalization was constructed regarding the target students as a whole. This study adopted a deductive approach (Wilson, 2014). It applies the well-known theory of entrepreneurship education, and the problem question is based on the existing theory.

### **Recruitment of Study Participants**

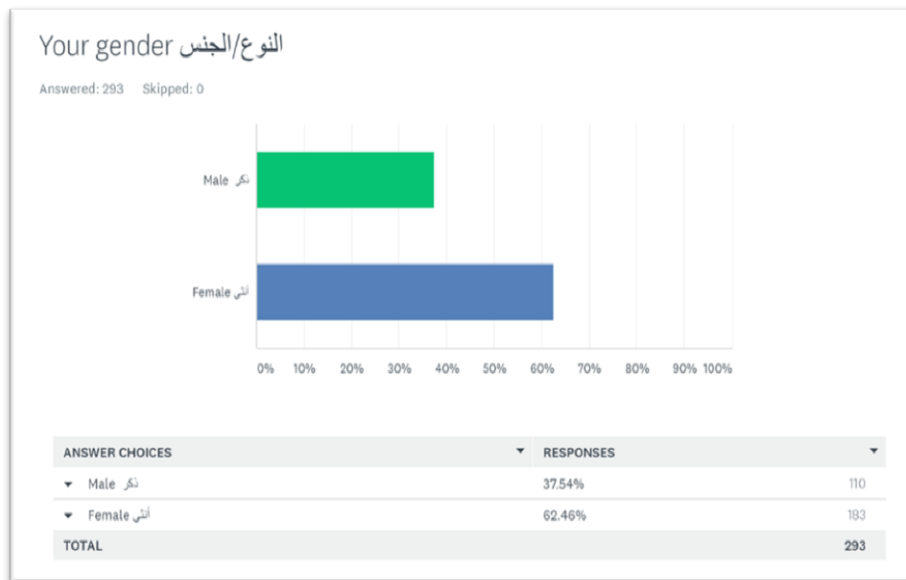
In this study, there were 300 currently registered students in the Faculty of Science at Cairo University. It was vital to define terms of elements, geographical parameters, and time (Bougie, 2010). The appropriate sample size was 293, as recommended, with a confidence level of 95% and a margin of error of 5%. Probability sampling was chosen for this study because it has the greatest freedom from bias, which is caused by the difference between the actual students and the sampling frame. This study adopted stratified random sampling because there was variation among the students. Therefore, this technique ensured that every stratum was effectively represented. This may also have a lower sampling error than simple, random sampling.

A total number of 293 students, plus 10% (for non-response or incomplete questionnaires), responded to questionnaires that were distributed to collect the data. Stages were identified as the strata, and the sample of 293 consisted of 47 students (1st class), 74 students (2nd class), 101 (3rd class), 47 students (4th class), one diploma student, eight master's students, 15 doctoral students, and one other student. The number chosen for each stage was almost appropriate to the size of the stratum in relation to the entire students. During the process of data collection, the lecturers were asked for 15 minutes of their lecturing time. The questionnaires were distributed by the researcher, who waited for the respondents to complete the survey and collected them once they were completed Figure 1.



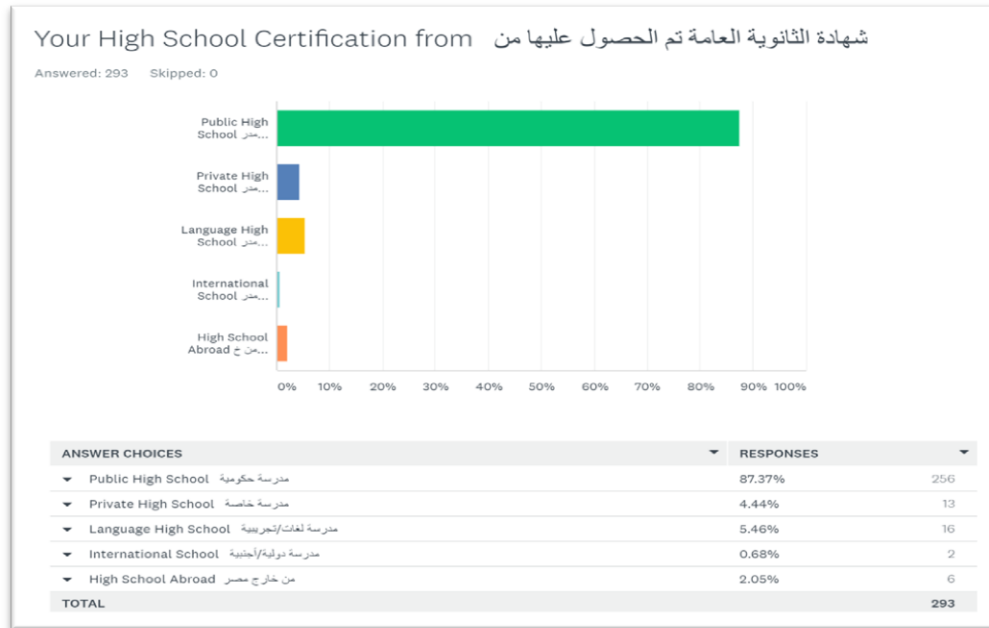
**Figure 1**  
**DISTRIBUTION BY ACADEMIC YEAR FOR PARTICIPANTS**

The gender distribution of the 293 students was 37.54% male and 62.46% female, (see Figure 2).



**Figure 2**  
**DISTRIBUTION BY GENDER FOR PARTICIPANTS**

1. The students came from high schools of different categories; the distribution was as follows: of the 293 students, 87.37% were from public schools, 4.44% were from private schools, 5.46% were from language high schools, 0.68% were from international language schools, and 2.05% were from abroad high schools Figure 3.
2. Figures 6-12 shows the distribution of students according to their: academic year levels, gender, age, subject specification, high school education and place of origin consequently.



**Figure 3**  
**HIGH SCHOOL GRADUATION FOR PARTICIPANTS**

### Construction of the Questionnaire

According to Wilson (2014), the questionnaire construction process is essential in that these key factors are considered: the purpose of the research, layout, length, and questionnaire. Questionnaires must be well developed and take into account the principles of wording and appearance of the questionnaire (Sekaran, 2016). The questionnaire consisted of 34 questions. The questions related to specific sections fell within the same theme in a logical order that encouraged students to complete the survey due to the flow of the questionnaire. The questionnaire for this study had closed questions because this technique helps the respondent make quick decisions. Additionally, it is significant to pre-test a questionnaire to establish whether it is clearly understood by the respondents. The questionnaire for this study was pre-tested by two professors from the Faculty of Commerce.

### Data Analysis

Data were coded, captured, and analyzed using IBM® SPSS® Amos version 26. Frequency distribution was performed for all the categorical variables. A chi-squared test of association was conducted to determine the association between the two categorical variables. P-values of <0.05 were considered statistically significant.

### Systematic Review Analysis

*“If entrepreneurial intentions precede entrepreneurial behavior, then entrepreneurship educators should benefit from intention-based research in entrepreneurship.”* If this is so, entrepreneurship education should investigate the drivers of EI (Kuehn, 2008). This question has been discussed in a literature stream on intention-based models for entrepreneurship education that suggests that the drivers of entrepreneurial intentions include attitudes, subjective norms, and perceived behavioral control. These elements of the theory of planned behavior (TPB) have also influenced the effectiveness of entrepreneurship education (EE) (Kuratko, 2005; Gorman et al., 1997; Rauch & Hulsink, 2015).

### **Personality and Intention**

Personality is considered to have a strong influence on EI and action to become an entrepreneur. EI would be a preceding and determining factor for engaging in business behaviors.

### **Theory of Planned Behavior**

The TPB began as the theory of reasoned action in 1980 and was used to predict an individual's intention to engage in a behavior at a specific time and in a specific place. The theory was intended to explain all behaviors over which people have the ability to exert self-control. The key component of this model is behavioral intent; behavioral intentions are influenced by attitudes about the likelihood that the behavior will have an expected outcome and the subjective evaluation of the risks and benefits of that outcome.

The TPB has been successfully used to predict and explain a wide range of health behaviors and intentions, including smoking, drinking, and health service utilization, breastfeeding, and substance use. The TPB states that behavioral achievement depends on both motivation (intention) and ability (behavioral control). It distinguishes three types of beliefs: behavioral, normative, and control. The TPB is comprised of six constructs that collectively represent a person's actual control over their behavior: attitudes, behavioral intention, subjective norms, social norms, perceived power, and perceived behavioral control. The TPB has shown more utility in public health than the health belief model, but it is still limited in its ability to consider environmental and economic influences.

## **RESULTS AND DISCUSSION**

The total of 300 hard-copy questionnaires were distributed, and 293 respondents completed the questionnaire.

### **Demographic Information**

The study questionnaire was designed to capture the following profiles of the students: high school, gender, age, current level of study, and zone citizenship. Table 1 indicates that the majority (62.46%) of students were female. Most students were between the ages of 16–24. In terms of the level of study, the results showed that the majority of the students were at the third level, and higher studies students were the least represented. Table 1 also shows that the majority of students had no experience with family business, and prior experience could represent mature students.

Table 2 shows that some students from other racial groups also had no family business experience. However, as family experience is not a major problem because entrepreneurship is not generic but a discipline that can be learned. These students are more likely to choose entrepreneurship as a career because family background has a significant influence on youth. In light of Table 2, a test of ( $p=0.001$ ) showed a significant association between family background and EI.

A 7-point Likert-scale questionnaire was adopted from the studies of Al-shammari & Waleed (2018) to test the assigned relations. The questionnaire consisted of four parts. The first covered students' backgrounds; the second covered personality and behavioral traits; the third covered societal traits; and the fourth covered students' skills. The first section of the questionnaire collected information about students' age, gender, education background, socioeconomic status, and specialty. For the other three sections in the questionnaire, the questions were adopted to measure the dimensions under study by implementing a 7-point Likert-scale used for all three section responses (1=strongly disagree, 2=disagree, 3=somewhat disagree, 4=neutral, 5=somewhat agree, 6=agree, 7=strongly agree).

We refer to the definition of EI as the “*self-acknowledged conviction by a person that they intend to set up a new business venture and consciously plan to do so at some point in the future*” (Thompson, 2009). EI has become a vibrant field in entrepreneurship research (Fayolle & Linan, 2014), as “*intentions have proven the best predictor of planned behavior, particularly when that behavior is rare, hard to observe, or involves unpredictable time lags*” (Krueger et al., 2000).

In a person's EI, there is a positive relationship among (1) pro-entrepreneurial attitudes, (2) subjective norms, and (3) perceived behavioral control.

The following hypotheses were developed from the theoretical framework:

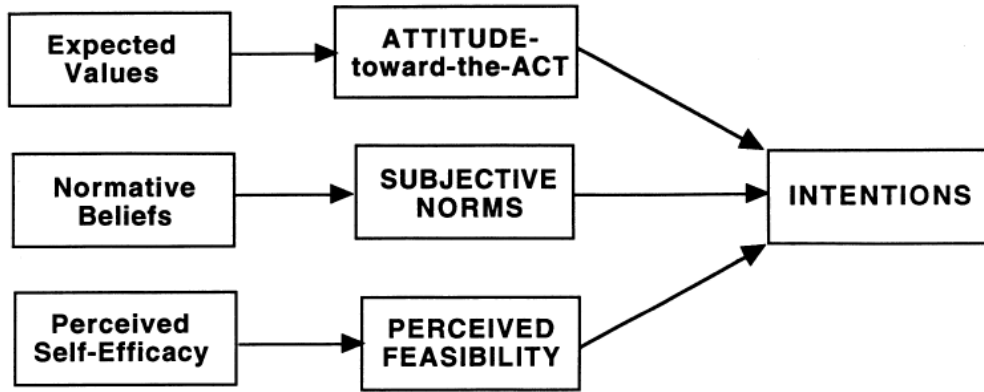
*H<sub>1</sub>: There is a significant relationship between attitude toward entrepreneurship and EI.*

*H<sub>2</sub>: There is a significant relationship between perceived behavioral control and EI.*

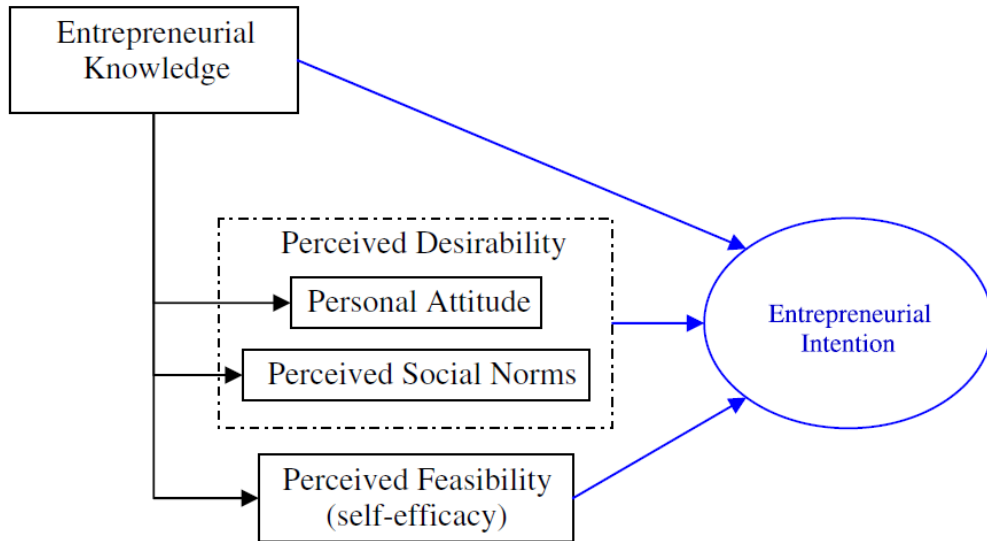
*H<sub>3</sub>: There is a significant relationship between subjective norms and EI.*

### **Ajzen's Theory of Planned Behavior**

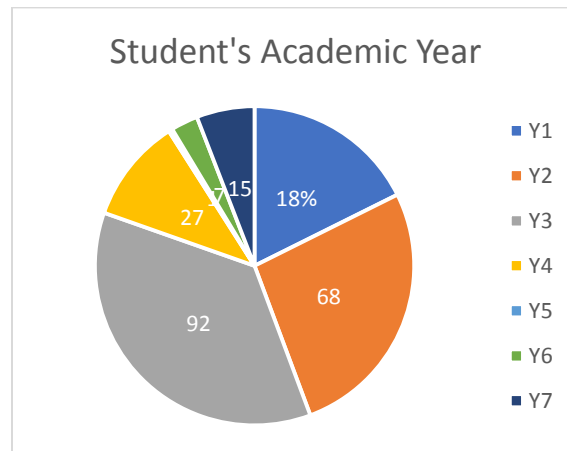
Based on Ajzen's (1985) TPB, the authors developed and tested a new model to analyze antecedents to M&E behavior (attitude, perceived norms, and behavioral control) and assessed how they impact practitioners' intentions to perform outcome M&E. The model was tested using a standardized active survey (n=400) see figures 4, and 5.



**Figure 4**  
**AJZEN'S THEORY OF PLANNED BEHAVIOR**

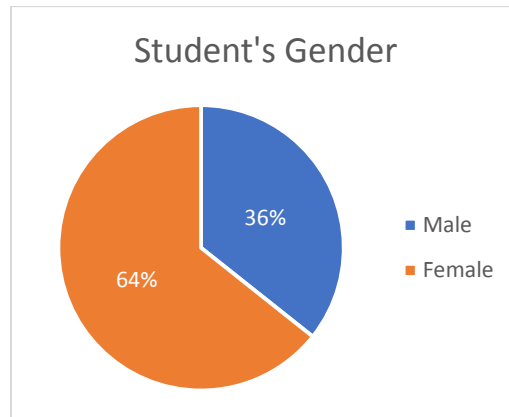


**Figure 5**  
**ENTREPRENEURIAL INTENTION MODEL, BASED ON LINAN, 2004.**

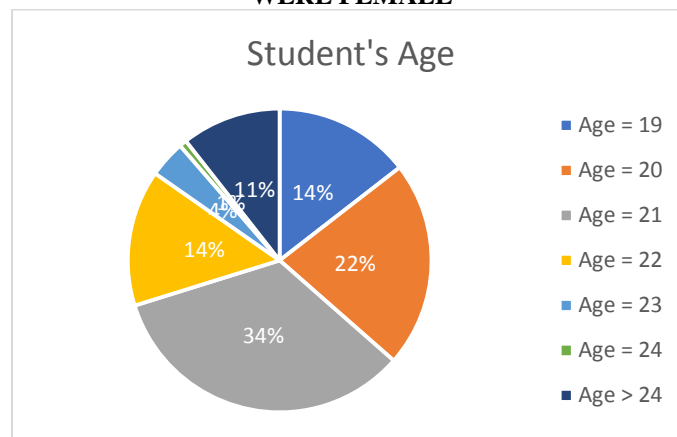




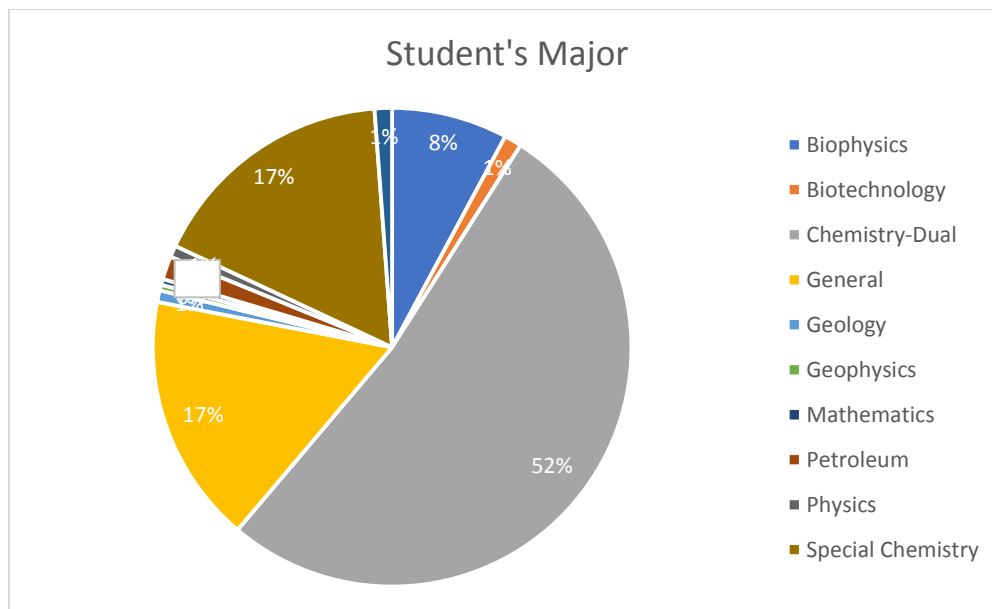
**Figure 6**  
**DISTRIBUTION OF STUDENTS BY ACADEMIC YEAR LEVEL SHOWING THE MAJORITY OF PARTICIPANTS WERE FROM THE THIRD AND SECOND YEARS**



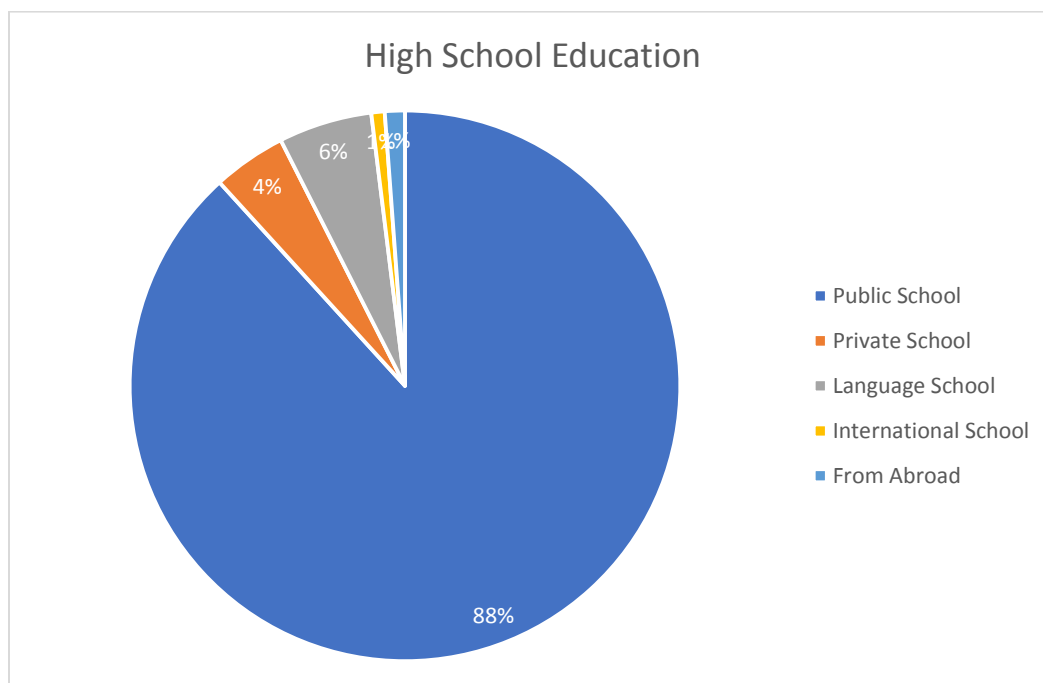
**Figure 7**  
**DISTRIBUTION OF PARTICIPANTS BY GENDER SHOWING THE MAJORITY OF STUDENTS WERE FEMALE**



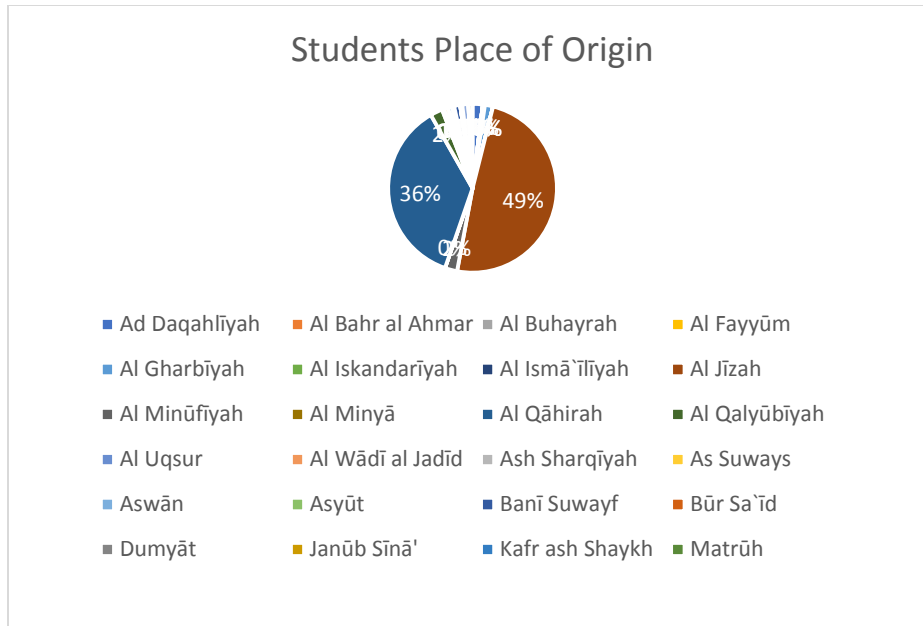
**Figure 8**  
**DISTRIBUTION OF PARTICIPANTS BY AGE SHOWING THE MAJORITY OF STUDENTS WERE AGED 20-21**



**Figure 9**  
**DISTRIBUTION OF PARTICIPANTS BY STUDY DISCIPLINE SHOWING THE MAJORITY OF STUDENTS WERE IN THE CHEMISTRY DUAL PROGRAM**

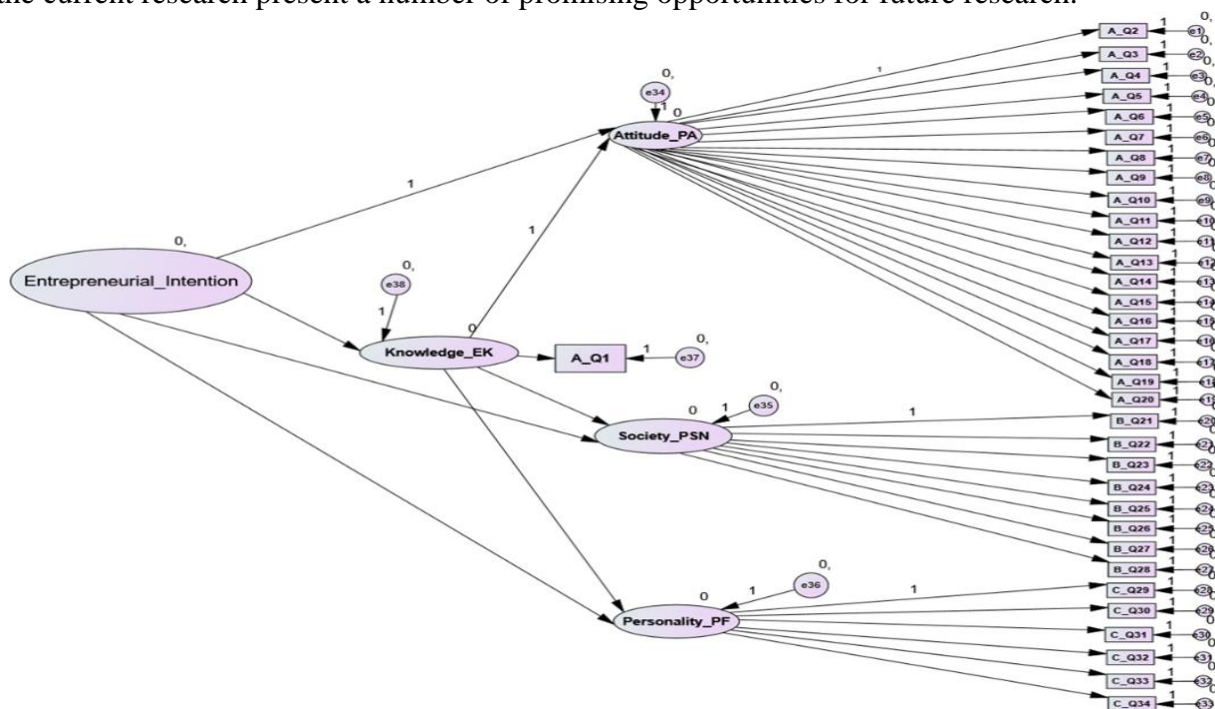


**Figure 10**  
**DISTRIBUTION OF PARTICIPANTS BY HIGH SCHOOL EDUCATION SHOWING THE MAJORITY OF STUDENTS GRADUATED FROM PUBLIC SCHOOLS**



**Figure 11**  
**DISTRIBUTION OF PARTICIPANTS BY PLACE OF RESIDENCE SHOWING THE MAJORITY OF STUDENTS LIVING IN CITIES**

We found significant positive relations between EE and EI. The findings and limitations of the current research present a number of promising opportunities for future research.



**Figure 12**  
**SPSS AMOS-SEM STUDY MODEL**

## DISCUSSION AND CONCLUSION

The goal of this study was to analyze two sets of conditions under which EE may be most effective for enhancing entrepreneurship intention (EI). We analyzed the role of motivational drivers and the type of prior education. We found general support for a positive effect of EE on EI. The results presented in this paper show some justification for the importance of EE at universities. The findings suggest that EE is generally effective for science students. This study used a cross-sectional approach to investigate the EE intentions at Egyptian universities as a requirement for building excellence in business. Researchers used the SEM technique, including both measurement and structural parts. The measurement part was used to construct the Attitude PA, Society PSN, Personality PF, and Knowledge EK. On the other hand, the structural part was used to draw the relation between all variables constructed, as mentioned in the conceptual framework.

The goodness of fit of our structural equations model was evaluated with a set of indicators and measures, and the results are shown in Table 1. The minimum discrepancy index (minimum discrepancy divided by its degrees of freedom) was 2.27, which is less than 5, and therefore it is in an acceptable range. The comparative fit index was 0.748, which is an acceptable level of goodness of fit because its value closes to 0.9. The normed fit index was 0.632, indicating poor goodness of fit of the model (which may due to the small sample size). The parsimony ratio index was 87%, which is the ratio of the number of paths dropped according to the model to the number of paths that can be dropped (all paths). Finally, the root means the square error of approximation was 0.071, which indicates an acceptable level of goodness of fit because it is close to the cut-off value of 0.05.

<b>Table 1</b>		
<b>MEASUREMENTS OF GOODNESS OF FIT OF THE STRUCTURAL EQUATION MODEL</b>		
<b>Measurement</b>	<b>Value</b>	<b>Acceptable value</b>
Minimum discrepancy/degrees of freedom	2.27	The lower the value below 5, the better the goodness of fit of the model
Comparative fit index	0.748	The higher the value over 0.9, the better the goodness of fit of the model
Normed fit index	0.632	The higher the value over 0.9, the better the goodness of fit of the model
Parsimony ratio index	0.877	
Root mean square error of approximation	0.071	The lower the value under 0.05, the better the goodness of fit of the model

For the measurement part, we can note that from the 19 questions instrument, (A\_Q2 to A\_Q19) is the one clearly identifiable factor (Attitude PA). Additionally, from the eight questions instrument, (B\_Q21 to B\_Q27) is the one clearly identifiable factor (Society PSN). The same is true for the rest of the six questions (C\_Q29 to C\_Q34) to construct the third instrument (Personality PF), from the three factors constructed (Attitude PA - Society PSN- Personality PF ) in addition to the factor (Knowledge EK), which is constructed from the factors (Attitude PA - Society PSN- Personality PF). From the first question (A\_Q1) we constructed the Knowledge EK factor. The relationship between the factors and their indicators is represented by a factor loading, as shown in Table 2, but Table 3 shows the squared multiple correlations.

Measurement	Estimate
Knowledge EK	0.767
Personality PF	0.187
Society PSN	0.485
Attitude PA	0.716

From Table 2, we can conclude that 76% of the variability in the Knowledge EK is accounted for by EI, but this was 19% for the Personality PF, 49% for the Society PSN, and 72% for the Attitude PA.

Factor Loading		Estimate	P	
Society_PSN	<---	Knowledge_EK	0.735	0.000
Attitude PA	<---	Knowledge_EK	1.000	0.000
Personality_PF	<---	Knowledge_EK	.339	0.000
Attitude PA	<---	Entrepreneurial Intention	1.000	0.000
Personality_PF	<---	Entrepreneurial Intention	0.328	0.000
Society_PSN	<---	Entrepreneurial Intention	0.847	0.000
Knowledge_EK	<---	Entrepreneurial Intention	0.992	0.000

### **Justification for Using SEM**

Table 3 introduces the regression weights (factor loading) for constructing the Knowledge EK, and we can conclude that the Society PSN was the most important variable in constructing the Knowledge EK, where its loading was 0.735. However, the least important variable was for the Personality PF, where the loading was 0.339 in constructing EI.

The most important variable was the Knowledge EK, followed by the Society PSN, which had a loading value of 0.847. On the other hand, we can note that all estimates in the model were highly significant, where the p-values for all estimates were 0.000, which less than 0.01, meaning all of them were highly significant.

We can conclude that the most important variable in constructing the Knowledge\_EK was the Society PSN, with the highest factor loading of (0.735), and the most important variables in constructing EI were the Knowledge EK and Society PSN, with factor loadings of -0.992 and 0.847, respectively. From our model, we can conclude that all estimates were highly significant, and all goodness of fit measures was met. Finally, for reliability, we can conclude that the highest percentages in interpreting the variability among the variables that construct EI were the Knowledge EK and Attitude PA, with 77% and 72%, respectively. We used AMOS software, version 23, which is a special module of SPSS only used for running structural equation models and confirmatory factor analysis. Structural equation modeling is a technique used to describe relationships among variables. Using a structural equation model helps to measure the direct, indirect, and total effects of exogenous and endogenous variables on an outcome variable. Additionally, SEM is used in conducting confirmatory factor analysis, where we attempt to prove an assumed theory, as we did in this study.

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