

Entrepreneurship Education for Higher Education Students in KSA and Its Impact on Their Employability: An Empirical Investigation

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Abstract

This research study aims to investigate the effect of teaching enterprise, new product development (NPD) and entrepreneurship on science and technology degree courses in Kingdom of Saudi Arabia (KSA) and its impact on students' attitudes towards starting a small business enterprise (SBE) or a new business enterprise (NBE). Based on the review of the related literature, the current research validates a conceptual model applying a post-positivist research philosophy with a triangulation approach, in which quantitative and qualitative triangulation is employed to deal with and collect the research data. Data were collected by means of interviews and survey strategy through questionnaires and data was analysis using path analysis. The results of the empirical investigation of this research and its findings support the research model and all of its hypotheses. The research results showed that teaching enterprise, new product development and entrepreneurship on science and technology degree courses in KSA have a significant impact on these students' attitudes towards starting a small business enterprise (SBE) or a new business enterprise. It was also found that entrepreneurship teaching has the highest significant positive impact on KSA science and technology students' attitudes towards starting a new business or a small business enterprise.

Keywords: Enterprise, New product development, Entrepreneurship, KSA, Science and technology degrees, Higher Education, Small business enterprise

1. Introduction

The concept of entrepreneurship has gained a lot of attention from both researchers and practitioners in the last few decades. Many attempts had been made to develop a better understanding of how entrepreneurship can be used to increase economic productivity, efficiently and effectively epically in developed nations. Unlike business students (in developing and developed nations), Kingdom of Saudi Arabia (KSA) higher education science and technology students often appears to lake real entrepreneurship sense due to cultural and educational reasons. Moreover, due to some other environmental factors, such students seem to be disadvantaged and far away from the complete understanding of the true meaning of Entrepreneurship. These environmental factors include: their scientific background, lack of training provided to them regarding enterprise, new product development and entrepreneurship, lack of governmental support for entrepreneurship and the availability of sufficient supply of jobs within KSA.

However, the KSA government is working very hard to encourage KSA higher education institutes to develop capable and talented graduates that have a extensive variability of entrepreneurial and innovation talents and skills.

As such, it is extremely important to investigate the influence of teaching enterprise, new product development and entrepreneurship on science and technology degree courses in KSA and the impact of this teaching on students' attitudes towards starting a small business enterprise (SBE) or their own businesses.

By reviewing the literature, it is noticed that although there is a large number of studies that had been conducted on entrepreneurship and entrepreneurship education, only very few studies were conducted to investigate its direct or indirect influence on students' attitudes towards starting a new business. Moreover, there are no studies that were conducted on entrepreneurship and entrepreneurship education in KSA.

1.1 Entrepreneurship:

Entrepreneurship had been defined in many different ways as expected for such an important concept. Table 1 illustrate some of the different definitions of entrepreneurship.

Table 1: Different definitions of entrepreneurship

<i>Study</i>	<i>Definition</i>
Asamani and Mensah (2013)	Entrepreneurship is the process of creating something new with value by devoting the necessary time and effort, assuming the accompanying financial, psychic, and social risk, and receiving the resulting rewards.
Uddin and Bose (2012)	Entrepreneurship is the process of identifying opportunities in the market place, committing actions and necessary resources to exploit the opportunities for long term personal gain.
Timmons and Spinelli (2008)	Entrepreneurship is a way of thinking, reasoning, and acting that is opportunity obsessed, holistic in approach and leadership balanced.

Meanwhile, Vesper's introduced an entrepreneurial typology which provides a good illustration to the different entrepreneurial typologies (as illustrated Table 2)

Table 2: Vesper's entrepreneurial typology

<i>N</i>	<i>Entrepreneurial Name</i>	<i>Entrepreneurial activity</i>
1	Starter	Enters an independent business by creating a new one
2	Acquirer	Enters an independent business by acquiring an ongoing one
3	Runner	Manages a small to medium business, Beyond start-up
4	Take-off artist	Steers a company into a high-growth trajectory
5	Turnaround artist	Saves a failing company
6	Innovator	Makes something new happen that is not a company
7	Champion	Supports innovator
8	Entrepreneur	Takes initiative for business unit creation inside an established business
9	Industry captain	Runs a big business

Source: Verheul, Uhlaner and Thurik (2005) p: 489.

1.2 Education is Kingdom of Saudi Arabia (KSA):

According to the KSA Central Department of Statistics and Information (CDSI), within 2013 KSA had 25 public universities, enrolling a total of 1,165,091 students, among whom 1,064,880 were studying at the undergraduate level. King Abdulaziz University had the largest total enrolment (177,234), followed by King Faisal University (134,942), and Imam Mohammed Bin Saud Islamic University (97,331) (CDSI, 2016 and WES, 2016b). Table 3 illustrate the main top universities in KSA.

Table 3: Top Universities in KSA

<i>N</i>	<i>University</i>
1	Jazan University
2	King Fahd University of Petroleum and Minerals
3	Umm Al-Qura University
4	University of Tabuk
5	University of Dammam
6	King Abdulaziz University
7	King Khalid University
8	Northern Borders University
9	King Faisal University
10	Al Baha University
11	Al-Imam Mohammad Ibn Saud Islamic University
12	Taif University
13	Princess Nora bint Abdulrahman University
14	King Saud bin Abdulaziz University for Health Sciences
15	University of Ha'il
16	Al Jouf University
17	King Saud University
18	Qassim University
19	Shagra University
20	Najran University
21	Taibah University

Source: The authors based on the information available from KSA Ministry of Higher Education (2016)

Figures 1, 2, 3 and 4 illustrate growth in the numbers of KSA population in the higher education age (18-24 years), growth in the number of registered students in public institutions of HE, growth in the number of freshmen in public universities, and globally mobility Saudi students 2004/2005 vs 2011/2012 respectively.

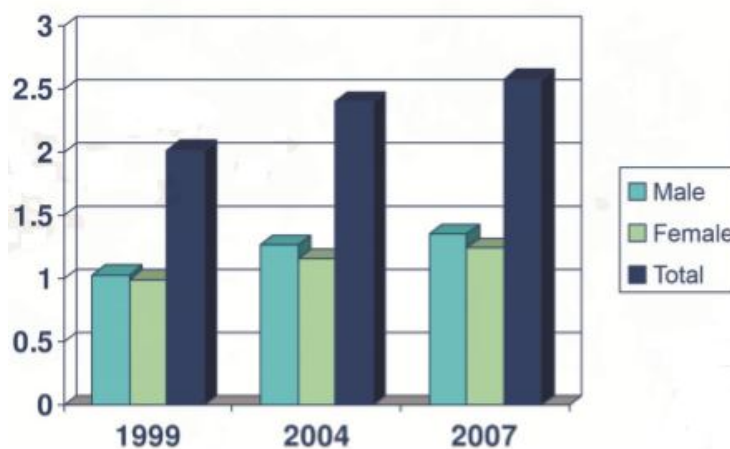


Figure 1: Growth in the numbers of KSA population in the higher education age (18-24 years) (millions)

Source: KSA Ministry of Higher Education (2016)

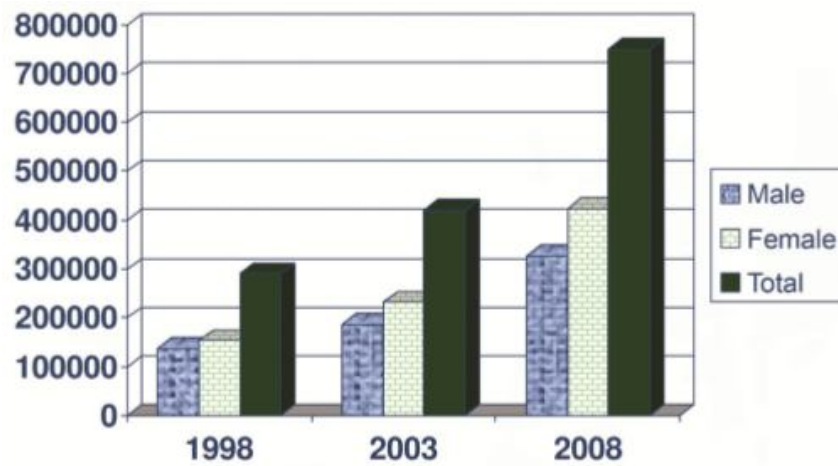


Figure 2: Growth in the number of registered students in public institutions of HE

Source: KSA Ministry of Higher Education (2016)

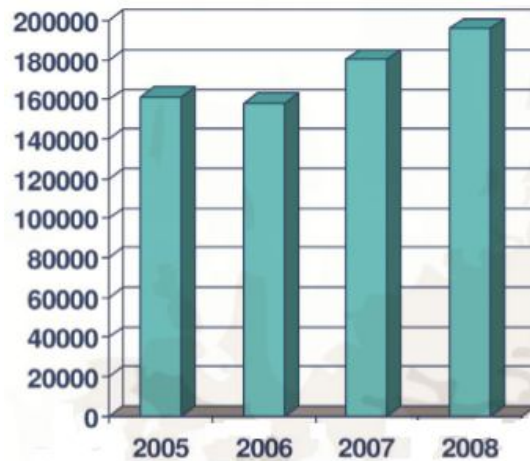


Figure 3: Growth in the number of freshmen in public universities

Source: KSA Ministry of Higher Education (2016)

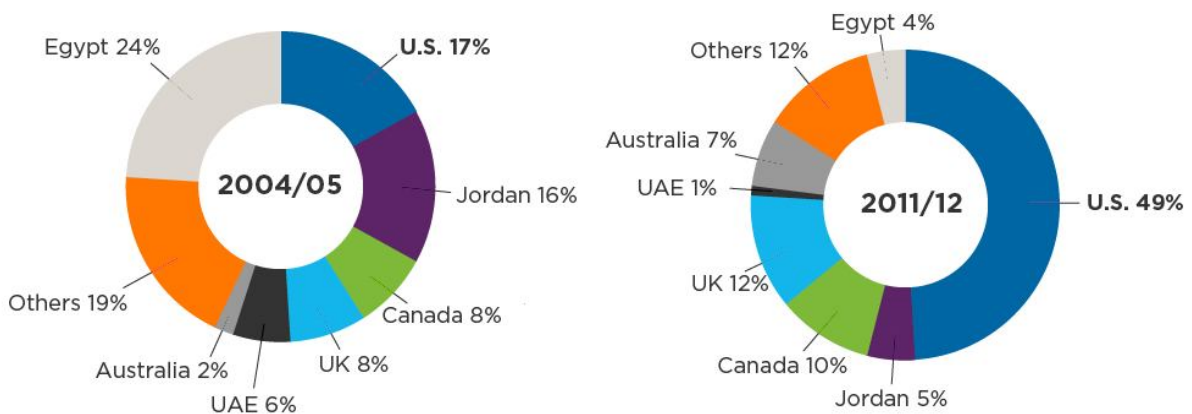


Figure 4: Globally Mobility Saudi Students 2004/2005 vs 2011/2012

Source: WES (2016a)

Table 4: Percentage of growth in a number of typical colleges in KSA during the period 2003-2009

<i>N</i>	<i>No Specialization</i>	<i>Number of current colleges</i>	<i>Percent of growth 2003-2009</i>
1	Medicine and medical sciences	54	400%
2	Science	27	285%
3	Pharmacy	13	333%
4	Computer science	18	500%
5	Engineering	26	271%
6	Community colleges	52	160%

Source: KSA Ministry of Higher Education (2016)

1.2.1 KSA National Qualifications Framework:

According to the KSA Public Education Evaluation Commission (PEEC), the Saudi Arabia Qualifications Framework is a unified inclusive system that sets standards and procedures for development, approval and classification of qualifications based on learning outcomes for specified levels (PEEC, 2016). The programme objectives are (according to KSA Public Education Evaluation Commission - PEEC, 2016):

- Building local standards for learning outcomes in education and training in KSA.
- Enhancing the confidence in KSA qualifications.
- Obtaining international recognition for KSA qualifications.
- Connecting between the different national KSA qualifications.
- Providing cooperation basis between KSA strategic partners in education and training sectors.
- Assuring and keeping educated collection records.
- Building coordination and integration between all education, training sectors in KSA.
- Building qualifications classification tools.
- Contributing in establishing and implementing KSA educational and training system (PEEC, 2016).

Table 5: KSA National Qualifications Framework

<i>N</i>	<i>Level</i>	<i>Qualification</i>	<i>Credit Requirements</i>
1	Entry	Completion of secondary education	N/A
2	Level 1	Associate Diploma	30
3	Level 2	Diploma	90
4	Level 3	Bachelor	120
5	Level 4	Higher Diploma	24
6	Level 5	Master	24-39
7	Level 6	Doctor of Philosophy	12-30

Source: WES (2016b) and NCAAA (2016)

2. Research problem:

The central problem inspiring this study is the essential need to recognise and understand the different effects of teaching enterprise, new product development and entrepreneurship on science and technology degree courses in KSA and the influence of this teaching on students' attitudes towards starting a small business enterprise (SBE) or their own business enterprises.

3. Research Objectives:

Henceforth, this study aims to enhance the acquisitive knowledge in the field of entrepreneurship and to develop the current frame of knowledge in the field through investigating the different influences of teaching enterprise, new product development and entrepreneurship on science and technology degree courses in KSA and the influence of this teaching on students' attitudes towards starting a small business enterprise (SBE) or a new business enterprises. To achieve this aim, a prearranged methodical organised inspection of the related literature to entrepreneurship teaching in general and in developing nations in particular is conducted to provide an archive of previous research points to sightsee and develop a clear understanding about the phenomena under investigation. Based on this review of related literature, the study validates a conceptual model utilising a post-positivist research philosophy with a triangulation approach, in which quantitative and qualitative data are collected based on interviews and survey strategy through questionnaires to address different levels of the current research.

4. Importance of the study

Such investigation for the phenomena under investigation will help in attaining a profound and reflective understanding of enterprise, new product development and entrepreneurship teaching practises by KSA Universities and HE institutions. The current research study provide excessive assistance for entrepreneurs, practitioners, researchers, policy makers, and educators and HE institutions through providing a richer view and profound understanding for all the different issues related to the influence of enterprise, new product development and entrepreneurship teaching on KSA science and technology students attitudes towards starting a new business enterprise.

Furthermore, this current research enhances the tremendously limited number of empirical studies that had been conducted to examine enterprise, new product development and entrepreneurship teaching by KSA Universities and HE institutions. Contingent on this research; researchers, educators, and scholars in the field can have a richer interpretation to set their approaches towards appropriate future research studies in the field which in turn will add a considerable contribution to the accumulated knowledge in the field.

5. Entrepreneurship in higher education:

5.1 Can entrepreneurship be learned?

Drucker (1985) introduced what he called “the entrepreneurial mystique”. According to him entrepreneurship is not magic, not mysterious, and it has nothing to do with genes. In contrast it's a discipline, and like any other management discipline, it can be learned (Drucker, 1985). Adopting Drucker (1985) point of view, if entrepreneurship can be learned, then it can be taught. In contrast to Drucker (1985) arguments, many other scholars do believe that entrepreneurs are born, not made. Among such scholars, Birch (2004) who argues that no one can teach people to be entrepreneurs, but entrepreneurship can be encouraged through some kind of apprenticeship.

Amalgamation of both points of view (entrepreneurs are born vs entrepreneurs are made) generates a fruitful environment for any person to become an entrepreneur. Even if entrepreneurs are born and they inherit their parental genes through their DNA, entrepreneurs can be made even better by gaining the extra skills, qualities, experience and knowledge that can be provided to them through education. As such, the question here should be diverted from: are entrepreneurs born or made? To: how can higher education universities and institutions provide entrepreneurship education programmes and modules that can shift its students' entrepreneurial ability. Accordingly, the question should be: how can higher education universities and institutions provide effective and efficient entrepreneurship education that can create successful entrepreneurs?

5.2 Entrepreneurship Education:

As illustrated earlier, entrepreneurship courses, degrees, and modules in higher education universities and institutions can have a positive impact on students and graduates entrepreneurial ability. Such entrepreneurship courses, degrees, and modules can equip and prepare students with the needed knowledge to boost their entrepreneurial attitudes and intention. Based on the review the related literature, it was found that many research studies have proven the positive impact of entrepreneurship education on higher education students' entrepreneurial attitudes and intention. Within this regard, Souitaris, Zerbinati, and Al-Laham (2007) found that entrepreneurship programmes has a positive effect on entrepreneurial attitudes and intention of science and engineering students. They also found that entrepreneurship programmes increased science and engineering students' subjective norm and intention towards self-employment in two major European universities with outstanding reputation for science and engineering studies, in London, UK and Grenoble, France.

Meanwhile, Kourilsky (1995) and Dyer (1994) indicated that entrepreneurship education at pre-college levels is very important in increasing interest in entrepreneurship and entrepreneurial ability. In addition, Gedeon (2013) attempted to identify and apply some of the best normative practices in university entrepreneurship education to create a new MBA in entrepreneurship and innovation management in Canada. He introduced the entrepreneurship program design framework (EPDF). Gedeon (2013) framework (EPDF) provided a rigorous structure for reviewing the literature, designing the new programs and establishing specific best practice recommendations for defining MBA programs goals, content, pedagogy and measurement of student transformation.

Lange et al. (2014) studied the influence of entrepreneurship education on students' intentions to become entrepreneurs with a sample of 3,775 Babson College alumni who graduated in the timeframe from 1985 to 2009. Their findings provided evidence that entrepreneurship education influences entrepreneurial intentions and leads to entrepreneurial careers of Babson College students (USA). Meanwhile, using the same sample, Lange et al. (2014) studied the same causal relationships between entrepreneurship education and students' intentions to become entrepreneurs. Their findings provided evidence that taking two (or more) essential entrepreneurship optional courses (at Babson College - USA) positively influenced students' intention to become entrepreneurs.

Sirelkhatim and Gangi (2015) provided a systematic literature review of curricula contents and teaching methods for 129 articles divided between entrepreneurship education and entrepreneurship learning. The findings illustrated that of the curricula content and teaching methods vary depending on the entrepreneurship programme objective. The following table illustrate the content and teaching method word frequency in entrepreneurship education published articles (as conducted by Sirelkhatim and Gangi, 2015).

Table 6: Content and teaching method word frequency in Entrepreneurship Education published articles

<i>N</i>	<i>Word or phrase</i>	<i>Word frequency</i>
1	Business plan	5,792
2	Marketing	484
3	Small business management	358
4	Simulations	167
5	Case studies	113
6	Networking	82
7	Product development	65
8	Opportunity recognition	52
9	Finance	47
10	Incubators	45
11	Guest speaker	37
12	Selling and sales	37
13	Mentoring	31
14	Team building	20
15	Generating ideas	29
16	Internships	14
17	Pitching ideas	10
18	Role playing	8

Source: Adopted from Sirelkhatim and Gangi (2015)

As can be seen in the table, business plan, marketing small business management, simulations, case studies, and networking were the most common used words (phrases) in entrepreneurship education published articles.

5.2.1 Entrepreneurship Education in Developing Countries:

5.2.1.1 Latin America:

Moriguchi, Oliveira and Menck (2014) evaluated the case of entrepreneurship teaching at the Business Administration Bachelor's Program offered by the Faculty of Management and Business at the Federal University of Uberlândia, in Minas Gerais State (Brazil). The results showed that the combining marketing courses with an entrepreneurship courses stimulate students' involvement with new products innovation and new products development. The findings also reinforced the importance of entrepreneurial attitudes and behaviours stimulation (e.g. self-learning, practical method approach, possibility of offering idea implementation) for the success of entrepreneurship teaching.

5.2.1.2 Africa:

Pulka, Rikwentishe and Ibrahim (2014) evaluated students' attitude towards entrepreneurship education in five selected North East Nigerian universities. Based on a sample of 370 students, the results indicated that the students are holding robust constructive attitude (with an overall attitude of 82.12%) towards entrepreneurship education in Nigeria universities.

5.2.1.3 Eastern Europe

Konig (2013) tried to define the impact of entrepreneurship teaching on the development of students' entrepreneurial behaviours. Based on a sample of 324 students of Josip Juraj Strossmayer University in Osije (Croatia), the results provided evidence that entrepreneurial behaviours can be developed through entrepreneurship teaching at university levels. Meanwhile, Turker and Selçuk (2008) investigated and analysed the impacts of contextual factors on entrepreneurial intention of Turkish university students. Based on a sample of 300 Turkish university students, the findings illustrated that perceived educational support and structural support affect the entrepreneurial intention of Turkish HE students'.

Also Badulescu and Badulescu (2014) investigated entrepreneurial attitudes among Romanian doctoral students. Based on a sample of 110 Romanian doctoral students (from three different universities), the findings illustrated that Romanian doctoral students have significant attitude towards entrepreneurship as well as high interest in acquiring skills entrepreneurial to use them in their future careers.

5.2.1.4 Asia:

Sharma (2014) attempted to assess the role of education in general and entrepreneurship education in particular in developing youth entrepreneurship in Uttarakhand State (India). Sharma (2014) findings confirmed that higher education institutions (HEIs) within Uttarakhand State were not effective enough in building entrepreneurial awareness and knowledge among its students. Within this regard, students who studied one or more entrepreneurship modules at higher education institutions within Uttarakhand State showed little entrepreneurial awareness and knowledge level of entrepreneurship, which was found to be statistically significant in comparison to their counterparts.

Within the same focus, Mahmud (2014) investigated Muslim female students' attitudes towards entrepreneurship in Bangladesh. Mahmud (2014) found that most female students in Bangladesh tend to perceive entrepreneurial activities to be risky and uncertain. The main reasons for such perceived risk and uncertainty were: lack of capital, experience, skills, knowledge, support from family, support from society and government; cultural obstacles; and gender discrimination.

5.2.2 Entrepreneurship Education in Arab countries:

The review of the related literature reinforced the fact that there are a reasonably large number of studies that had been conducted on entrepreneurship education. Nevertheless, only very few studies were conducted to investigate it in Arab higher education universities and institutes. Furthermore, fewer studies were conducted to investigate entrepreneurship education direct or indirect influence on students' attitudes towards starting a new business (El-Gohary, O'Leary and Radway, 2012).

Considering the number of studies that were conducted to investigate entrepreneurship education in Arab countries, only 5 studies were found in the related literature. These studies are the studies of: El-Gohary, Selim and Eid (2016), Al-Harrasi, and Al-Salti (2014), Al-Ali (2014), Saleh and Salhieh (2014), and El-Gohary, O'Leary and Radway (2012). Meanwhile, there are many other research studies that were conducted to investigate entrepreneurship, SMEs, and SBEs in Arab countries (e.g. El-Gohary, and El-Gohary, 2016; El-Gohary and Eid, 2013a; El-Gohary and Eid, 2013b; El-Gohary, 2012a; El-Gohary, 2012b; El-Gohary, 2011; El-Gohary, 2010c; Hamad, Elbeltagi and El-Gohary, 2016; Zaki, Edwards and El-Gohary, 2015; Hamad, Elbeltagi, Jones and El-Gohary, 2016; Ahmed, Hay and El-Gohary, 2015; El-Gohary, 2010a; ; El-Gohary, 2012c; El-Gohary, 2010b; El-Gohary, Trueman and Fukukawa, 2009a; El-Gohary, Trueman and Fukukawa, 2009b; El-Gohary, Trueman and Fukukawa, 2009c; El-Gohary, Trueman and Fukukawa, 2008a; El-Gohary, Trueman and Fukukawa, 2008b; etc.)

6. Research Framework Hypothesis:

Based on the previous debates and the thorough appraisal of the linked literature, the research framework was constructed (figure 5) to test the following research hypothesis:

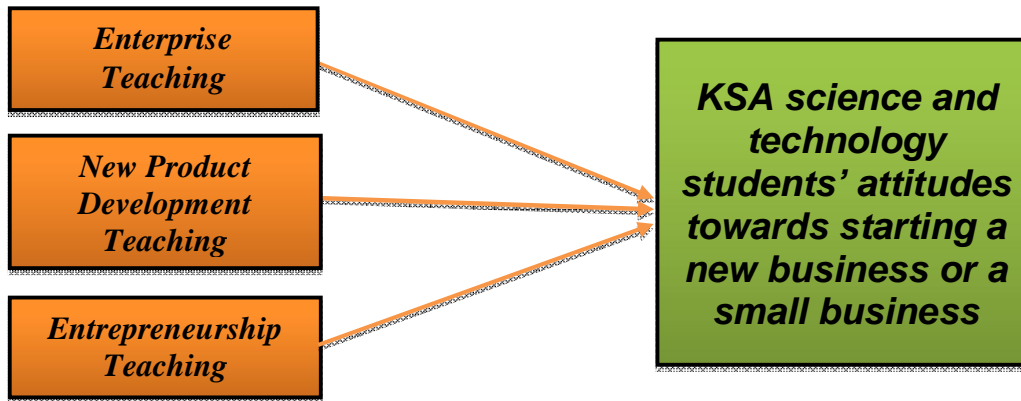


Figure 5: The research framework.

H1- Teaching enterprise on science and technology degree courses in KSA has a positive impact on students' attitudes towards starting a small business enterprise (SBE).

H2- Teaching new product development on science and technology degree courses in KSA has a positive impact on students' attitudes towards starting a small business enterprise (SBE).

H3- Teaching entrepreneurship on science and technology degree courses in KSA has a positive impact on students' attitudes towards starting a small business enterprise (SBE).

7. Methodology and Research Design:

This research aims to explore the current practices of enterprise, new product development and entrepreneurship teaching within KSA HE institutions, as well as investigating the influence of teaching such subjects on science and technology students' attitudes towards starting a small business enterprise (SBE) or a new business. As such, the key goal of the study is to test and investigate the causal relationships between teaching enterprise, teaching new product development, and entrepreneurship teaching and science and technology students' entrepreneurial attitudes.

By studying the related literature in the field, it is observed that there are a respectable number of research studies that had been conducted to investigate entrepreneurship education (e.g. El-Gohary et. al., 2016; Sandhu et. al., 2011; Franco et. al., 2010; Kirby and Ibrahim, 2011; Matlay, 2011; Davey et. al., 2011; Iakovleva et. al., 2011; Packham et. al., 2010; and Nabi and Holden, 2008). It is also noticed that although a considerable number of studies were conducted in developed countries like: Australia, Canada, France, Germany, Norway, Spain, and the Netherlands (e.g. Iakovleva et. al., 2011; Moriano et al. 2011; Engle et al., 2010; Packham et. al., 2010; Franco et. al., 2010; Liñán and Chen, 2009), there is paucity in the literature investigating the causal relationship between entrepreneurship teaching and science and technology students' entrepreneurial attitudes within the KSA and/or Arab countries.

Consequently, when conducting the proposed research it is not appropriate to generate the research hypotheses depending only on the available literature in the fields of enterprise, new product development and entrepreneurship education. In this respect, a robust in-depth examination of the phenomenon is needed as a starting point to generate appropriate hypotheses as well as a reliable formulation of the research problem. Moreover, a case study based on qualitative methods will be very useful and will help in: exploring the current practices of enterprise, new product development and entrepreneurship teaching within KSA HE and answering the questions of 'how' and 'why' in relation to entrepreneurship teaching and its impact on science and technology students' entrepreneurial attitudes. Consequently, both descriptive and quantified descriptions of the phenomenon that employs both quantitative and qualitative techniques will be used in this study.

Based on the overhead debate, there are adequate philosophical and practical motives for depending on the post-positivist approach in conducting this current research. There are two main reasons for this choice. Firstly, this research aims to illustrate and explore the different contexts of the enquiry as a starting point towards establishing a cause and effect relationship between the phenomenon's main constructs. This main objective cannot be classified as either purely positivistic nor purely interpretivist research, since it incorporates elements of both paradigms. Consequently, this research falls logically into post-positivism, which is positioned between positivism and interpretivism (Lincoln and Guba, 2000). Secondly, the mixed approach for this inquiry adopted by this research is argued to be within the post-positivism approach which emphasises the use of a variety of techniques from the positivist and the interpretivist paradigms (El-Said and Brunel, 2005). This post-positivist approach will be employed in conducting this research depending on triangulation approach, in which quantitative and qualitative data are collected (all over the KSA) based on interviews and survey strategy through questionnaires to address different levels of the study project.

Meanwhile, enterprise, new product development and entrepreneurship studies have utilised a combination of qualitative and quantitative approaches. It is noticed that qualitative approaches have been used mainly where profound understandings were needed in respect of particular entrepreneurship phenomena (e.g. Nabi and Liñan 2011; Matlay, 2011; Mwasalwiba, 2010; Matlay, 2008; Kirby, 2004; Hynes, 1996; and Garavan and O'Conneide, 1994), whilst quantitative approaches have been useful in cases where the data was available (e.g. Iakovleva et al., 2011; Davey et al., 2011; Sandhu et al., 2011; Kirby and Ibrahim, 2011; Packham et al., 2010; Franco et al., 2010; Petridou et al., 2009; Pruett et al., 2009; Liñan and Chen, 2009; Jones et al., 2008; and Gallaway and Brown, 2002). Based on the general principle that research methodology employed by the researcher must be appropriate for the questions that he wants to answer, it is believed that triangulation approach is the most suitable methodology to be used in this research to increase the validity and credibility of the research conclusions and findings. Data, method and methodological triangulation will take place based on a combined research strategies. Even though triangulation requires a commitment to greater amounts of effort, and time, it has the advantage of removing the bias that is often associated with the use of a single technique.

7.1 Research Sample and Data Collection:

The qualitative part of the current study was conducted depending on data collected through personal interviews. A total of 27 interviews were conducted to collect the required data. Meanwhile, the quantitative part of the current study was conducted depending on data collected through research survey which targeted a sample of 1500 students studying on science and technology degree courses that were selected randomly from students at 6 different universities in KSA. The developed research instrument was distributed and out of 1500 questionnaires, a total of 432 questionnaires were returned with a response rate of 28.8 % which is considered to be a very high response rate among similar studies within KSA and/or Arab countries. This is mainly due to the careful follow-up by the research team and the high number of reminders that were sent to the research sample to complete the required developed research instrument.

7.1.1 The research instrument:

The development of the survey instrument was based mostly on adopted new scales that were developed by the research team to directly address the phenomena under investigation in KSA context. Different new measures were validated through the data collected via the interviews. Meanwhile, when applicable, measures that have been previously applied were used (such as the measures of entrepreneurship educational which was adopted from: El-Gohary and Eid (2013), El-Gohary, O'Leary and Radway (2012), the measures of intentions of starting a business which was adopted from: Iakovleva et al., 2011; Liñan and Chen, 2009; and Kolvereid, 1996 as well as the measures of attitudes towards starting a business was adopted from: Liñan and Chen, 2009; and Kickul and Krueger, 2004). However, where possible, these measures were adjusted to be suitable to the KSA and research context.

The instrument was pre-tested 4 times to warranty that the study respondents will understand all the research measurement scales used in the study easily. Subsequently, the study survey instrument was piloted with a selective sample of the research participants, research experts, and highly qualified academics. Based on the feedback provided through the pilot examination, the research instrument was altered to completely reflect the phenomena under investigation.

8. Analysis and results:

The following tables deliver an illustration of the main results of descriptive analysis for the data collected from the research sample.

Table 7: Distribution of the research qualitative sample by age

<i>Age</i>		<i>Frequency</i>	<i>%</i>	<i>Valid %</i>	<i>Cumulative %</i>
Valid	Less than 20 years	5	18.5	18.5	18.5
	20 - 22 Years	22	81.5	81.5	100.0
	Total	27	100.0	100.0	-

Table 8: Distribution of the research qualitative sample by gender

<i>Gender</i>		<i>Frequency</i>	<i>Percent</i>	<i>Valid %</i>	<i>Cumulative %</i>
Valid	Male	21	77.8	77.8	77.8
	Female	6	22.2	22.2	100.0
	Total	27	100.0	100.0	-

Table 9: Distribution of the research qualitative sample by university

<i>University</i>		<i>Frequency</i>	<i>Percent</i>	<i>Valid %</i>	<i>Cumulative %</i>
Valid	A	3	11.2	11.2	11.2
	B	0	00.0	00.0	11.2
	C	8	29.6	29.6	40.8
	D	5	18.5	18.5	59.3
	E	6	22.2	22.2	81.5
	F	5	18.5	18.5	100.0
	Total	27	100.0	100.0	-

Table 10: The research qualitative sample Age * Gender Cross-tabulation

		<i>Gender</i>		<i>Total</i>
		<i>Male</i>	<i>Female</i>	
<i>Age</i>	Less than 20 years	3	2	5
	20 - 22 Years	18	4	22
Total		21	6	27

The qualitative sample was well distributed and provided a well-balanced sample to collect the needed data. The analysis of the qualitative data collected through the interviews was used mainly to validate the research measures which were newly developed for conducting the current research study. Meanwhile, a good understanding of the research main variables was generated through the interviews. Elements such as: Module Content, Module Delivery, Teaching Environment, Enterprise Teaching, and New Product Development (NPD) Teaching were enhanced and developed for the research questionnaire depending on the results of the qualitative analysis for the data collected through the interviews using content analysis.

Table 11: Distribution of the research quantitative sample by age

<i>Age</i>		<i>Frequency</i>	<i>%</i>	<i>Valid %</i>	<i>Cumulative %</i>
Valid	Less than 20 years	37	8.6	8.6	8.6
	20 - 22 Years	322	74.5	74.5	83.1
	More than 22 years	73	16.5	16.9	100.0
	Total	432	100.0	100.0	-

Table 12: Distribution of the research quantitative sample by gender

<i>Gender</i>		<i>Frequency</i>	<i>Percent</i>	<i>Valid Percent</i>	<i>Cumulative Percent</i>
Valid	Male	281	65.0	65.0	65.0
	Female	151	35.0	35.0	100.0
	Total	432	100.0	100.0	-

Table 13: Distribution of the research quantitative sample by university

University	Frequency	Percent	Valid %	Cumulative Percent
Valid	A	58	13.5	13.5
	B	65	15.0	28.5
	C	72	16.6	45.1
	D	69	15.9	61
	E	79	18.2	79.2
	F	89	20.8	100.0
	Total	432	100.0	100.0

Table 14: The research quantitative sample Age * Gender Cross-tabulation

		Gender		Total
		Male	Female	
Age	Less than 20 years	21	16	37
	20 - 22 Years	244	78	322
	More than 22 years	16	57	73
Total		281	151	432

Table 15: The research quantitative sample Age * University Cross-tabulation

		University						Total
		A	B	C	D	E	F	
	Less than 20 years	4	8	7	9	3	6	37
	20 - 22 Years	57	51	62	49	63	40	322
	More than 22 years	8	14	9	12	15	15	73
Total		69	73	78	70	81	61	432

Table 16: The research quantitative sample Gender * University Cross-tabulation

		University						Total
		A	B	C	D	E	F	
	Male	53	46	44	59	57	22	281
	Female	5	19	28	10	22	67	151
Total		58	65	72	69	79	89	432

Meanwhile, reliability analysis was conducted depending on the calculation of: a) coefficient alpha (Cronbach alpha) and; b) item-to-total correlation for the research measures and constructs. The results showed that all the research variables had a very good item-to-total correlation values (ranging from 0.443 to 0.775) and high reliability coefficient ranged from 0.788 to 0.918 with a Cronbach's Alpha Based on Standardised Items equal 0.845. The values of item-to-total correlation and Cronbach's Alpha were considerably and significantly higher than the reliability acceptable levels suggested by: Hamad, Elbeltagi and El-Gohary (2016), Hamad, Elbeltagi, Jones and El-Gohary (2015), Eid and El-Gohary (2015a), Eid and El-Gohary (2015a), Ahmed, Hay and El-Gohary (2015), Eid and El-Gohary (2014), Iqbal and El-Gohary (2014), Eid and El-Gohary (2013), El-Gohary, et al., (2013), El-Gohary, Edwards and Huang (2013), El-Gohary (2012), Millman and El-Gohary (2011), El-Gohary (2010a), El-Gohary (2010b), El-Gohary (2009), Edgett (1991), Edwards, et.al. (2016), and Magal et al., (1988).

Therefore, the results of the coefficient alpha (Cronbach alpha) and item-to-total correlation provide good evidence that the research measures are satisfactory adequate for conducting further data analysis through inferential statistics to test any research hypothesis and the proposed research conceptual framework. Data were analysed using path analysis. As path analysis is a multivariate investigative methodology for empirically examining sets of relationships in the form of linear causal models (Garson, 2009), it is suitable for analysing the research data. The aim of using path analysis was to examine the direct and indirect effects of each hypothesis on the basis of knowledge and theoretical constructs as suggested by Kenny (2008). As discussed earlier, Figure 5 illustrates the proposed framework (path diagram) that reflects the relationships between the different research variables.

To calculate the value of the path coefficient associated with each path, which represents the strength of each linear influence, SEM package AMOS V18 were used to test the hypotheses developed in the framework, applying the maximum likelihood estimates method, following the guidelines suggested by Jöreskog and Sörbom (1982, 1984). To satisfy the advanced analysis requirements, the researchers investigated the multivariate normality of the data set through conducting skewness test of normality (Garson, 2009) and investigating the histograms of the different research variables. The results indicated no departure from normality. The framework (see Figure 1) indicated a great fit of the data, and the results obtained confirmed that the model had a great fit: goodness-of-fit index=0.910, root mean square residual =0.059, comparative fit index=0.904 and incremental fit index=0.914 (Table 17). Figure 6 demonstrate the path diagram for the research model which reflects the estimated standardised parameters for the paths, their level of significance and the square multiple correlations for each construct.

Table 17: Fit indices for the research path model

<i>Goodness-of-fit Index</i>	<i>Root Mean Square Residual</i>	<i>Comparative Fit Index</i>	<i>Incremental Fit Index</i>
0.910	0.059	0.904	0.914

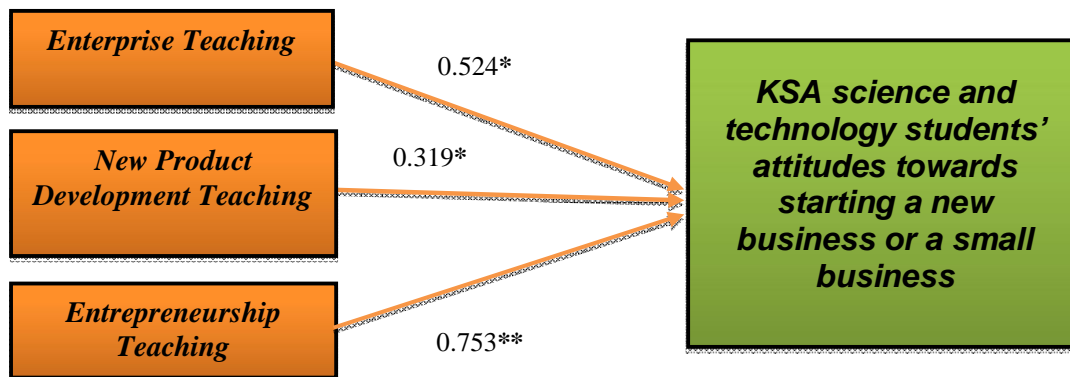


Figure 6: The path diagram for the study model.

Notes: ns, not significant; ***, **, *significant at 0.001, 0.01, 0.05 levels respectively

Results indicated that enterprise teaching, new product development teaching, and entrepreneurship teaching factors positively affects KSA science and technology students' attitudes towards starting a new business or a small business (standardised estimate (SE)=0.524, $p < 0.05$, SE=0.319, $p < 0.05$, and SE=0.753, $p < 0.05$ respectively). It was also found that entrepreneurship teaching has the highest significant positive impact on KSA science and technology students' attitudes towards starting a new business or a small business (SE=0.753, $p < 0.05$). Henceforth, hypotheses: H1, H2 and H3 can be supported.

Conclusion and direction for future Research

The results of the empirical investigation of this research and its findings support the research model and all of its hypotheses. The research findings illustrated that enterprise teaching, new product development teaching, and entrepreneurship teaching factors positively affects KSA science and technology students' attitudes towards starting a new business or a small business. It was also found that entrepreneurship teaching has the highest significant positive impact on KSA science and technology students' attitudes towards starting a new business or a small business. Meanwhile, the results of the empirical investigation of this research provide a complete understanding of the influence of teaching enterprise, new product development and entrepreneurship on science and technology degree courses in KSA and the impact of this teaching on students' attitudes towards starting a small business enterprise (SBE) or a new business. Based on such understanding (in a later research) a complete platform (a complete resource pack for KSA science and technology lecturers and students) can be developed (subject to the availability of suitable funding) to provide the needed teaching materials to teach enterprise, new product development and entrepreneurship to science and technology students within KSA Universities (e.g. King Abdul-Aziz University)

Meanwhile, the outcomes of the proposed research can be provided to all the governmental and non-governmental institutions related to the promotion of entrepreneurship and entrepreneurial thinking (e.g. Saudi Entrepreneurship Society). This will help in achieving high impact dissemination for the knowledge generated from such research.

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