EFFECTS OF THE CURRICULUM CONTENT IN DEVELOPING AND BUILDING KNOWLEDGE, PRINCIPLES AND METHODS OF ENTREPRENEURSHIP AND INNOVATION AMONG JUST STUDENTS, JORDAN

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ABSTRACT

Entrepreneurship is a key element in economic development; it helps combating poverty and unemployment. Worldwide, school and university curricula have been developed to cover principles of entrepreneurship and innovation. The main objective of this study is to disclose the effects of the course curriculum content "Entrepreneurship and Innovation" in developing and building knowledge, principles, and methods of entrepreneurship and innovation, among students of the Jordan University of Science and Technology (JUST). The experimental and statistical methods were applied on a population of 832 male and female students. The study involved two hypotheses: the impact of the curriculum content in building knowledge and formation of basic concepts in entrepreneurship and innovation, and the impact of the curriculum content in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects. The results revealed that there are statistically significant differences between the before and after tests for both hypotheses. Additionally, there was no significant difference between the two hypotheses for gender and level of the study of the students. This can be attributed to the absence of entrepreneurship material in the school curricula in Jordan.

Keywords: Curriculum, Entrepreneurship and Innovation, Knowledge, JUST.

INTRODUCTION

Entrepreneurship plays a vital role in economic development. It contributes to the growth of countries and increases the income of their individuals. This can be achieved through the innovation and creation of new projects and jobs. It is one of the most critical inputs to the developed economy. Today, the United States, Russia, and Japan consider entrepreneurship as a primary reason and a direct cause of their economic development. This has led many developing countries to adopt entrepreneurship because of the role it plays in economic development (Badri & Hachicha, 2019; Ramidi, 2018; Rivera, 2007).

Amrita (2016) and Eid (2014) indicated that in the last two decades, entrepreneurship education and innovation have become one of the main pillars contributing to economic development because of its impact in creating a generation of entrepreneurs and innovators. Entrepreneurship curricula, educational and training programs are beginning to appear in many

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curricula of schools, colleges, and universities around the world. (Fischera et al., 2019; Loss & Bascunan, 2011). Therefore, there are now colleges and specializations awarding various degrees in entrepreneurship and innovation (Babson College, University of Tampa - Sykes College of Business, Princess Sumaya University for Technology (PSUT), Prince Mohammed Bin Salman College (MBSC), Skyline University College (SUC), Endicott College, Etc.).

There are many studies that deal with the teaching of entrepreneurship and innovation in schools and universities (e.g. Al-Hammad, & Al-Qudah, 2019; Ayasrah et al., 2019; Alarmede, 2018; Gangi, 2017; Din et al., 2016; Doğan, 2016; Rashid & Al Arabi, 2016; Abdelkader & Ibrahim, 2015; Mubarak, 2005). In general, these studies confirm the importance of the subject of teaching entrepreneurship and innovation and its role in creating a generation capable of creativity, innovation, and development in various disciplines. Moreover, the taught courses help students to transform their ideas and creativity into small and medium-sized entrepreneurship, and thus contributing in socioeconomic development. A study carried out by Kyle (2005) emphasized that the idea of entrepreneurship education is not a new one, and in the last thirty-five years, the entrepreneurship curricula have grown significantly. He found that entrepreneurial education can help creating entrepreneurs. Entrepreneurship education is one of the tools that encourage university transformation and development. Previously, most of the curricula of entrepreneurship were taught primarily in business schools. Nowadays, it is taught in all colleges regardless of the areas of specialization of the students. The entrepreneurial approach stimulates creativity, innovation, and intellectual property protection, two of the essential characteristics required by United States companies for their future employees.

Olokundun et al., (2017) carried out a study to investigate the impact of the content of the entrepreneurship curriculum on the development of critical thinking, and business among a sample of Nigerian university students. The findings of the study showed that the design of an entrepreneurship curriculum could motivate critical thinking abilities in students to generate creative business ideas. The study emphasized that the use of practical activities such as brainstorming, mind mapping, and similar events can stimulate idea generation among students. A study by McClure (2015) showed that many colleges and universities in the United States have developed and offered a variety of opportunities for undergraduate students to learn about innovation and entrepreneurship. These universities have established a solid ground, and developed guidelines to build curricula of innovation. There are four main reasons behind this transformation: perceived labor market demands, student interest, private donations, and competition with other institutions. Therefore, the study empirically confirmed the vital role of market competition and external resources in curriculum formation and the change in higher education today.

The Hashemite Kingdom of Jordan is one of the leading developing countries in nationalizing and sponsoring entrepreneurship and innovation projects and programs. This status has been reached through providing infrastructure, technology, political and legal legislations, expansion of emerging projects, and urging educational institutions to adopt curricula and programs to teach and disseminate the culture of entrepreneurship and innovation (JEDCO & CSS, 2019).

Jordan University of Science and Technology (JUST) has distinguished itself at the national and Arab levels in adopting entrepreneurship and innovation through many programs, activities, events, and initiatives. It pioneered the introduction of the curriculum of "*Entrepreneurship and Innovation*" for all its students regardless of their specialization. Additionally, the Center of Excellence for Innovative Projects has been founded to foster

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intellectual property protection. The center hosts a business incubator and accelerator. "*Entrepreneurship and Innovation*" is one of the newest courses in the university. It came into application four years ago and has benefited more than 10000 students so far. The core importance of this curriculum lies in creating and establishing of entrepreneurial thinking among young people. This will direct them to invest in their abilities and expertise to be able to develop entrepreneurial small and medium- scale enterprises that will contribute to the economic and social progress of the nation and for the future. Following the curriculum at the level of Jordanian universities, JUST was the first university at the national level that introduced such curriculum, and enforced it as a compulsory course for all its students. Therefore, this research focuses on determining the impact of the curriculum content of "*Entrepreneurship and Innovation*" in building the knowledge about, and formation of basic concepts in entrepreneurship and innovation. We also seek, as a statement, the impact of the curriculum of course in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects among students of JUST. Furthermore, we seek to answer some critical questions: Are there statistically significant differences in the curriculum content of entrepreneurship and innovation in the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation? What is the impact of the curriculum content of entrepreneurship and innovation in acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects level among the students due to gender and the level of the study?

MATERIAL AND METHODS

Course Curriculum: Entrepreneurship and Innovation

The curriculum of the course is an international one and being taught in the finest American and European universities. The course is compulsory for all academic majors at the bachelor's level with two credit hours and offers an introduction to entrepreneurship and creativity. The overall objective of the course is to help students evaluate their work skills, commit them to run a pilot project successfully, and review their entrepreneurial challenges. The students learn about themselves, their decisions, and goals to determine how entrepreneurship can play a significant role in their working lives. The students gain a lot of economic concepts, environmentally sustainable practices, and social entrepreneurship. They learn a range of ways to enhance their creativity. The online method is the teaching method through E-learning Moodle. The curriculum consists of two aspects. The first aspect, which is theoretical (knowledge), consists of four chapters, namely: (1) The Foundations of Entrepreneurship, (2): Inside the Entrepreneurial Mind: From Ideas to Reality, (3): Conducting a Feasibility Analysis and Designing a Business Model, and (4): Crafting a Business Plan and Building a Solid Strategic Plan. The second aspect is practical (applied). It offers a lot of practical activities that serve the theoretical cognitive perspective. This part provides the students with the necessary skills and practical experiences that will help them make headway in the world of entrepreneurship and creativity. Some of the activities carried out include a variety of exercises and practical applications (such as carrying out the assessment of entrepreneurial ideas, building a business plan, and feasibility study), a range of induction programs, lectures and specialized forums, and conducting field visits to specialized institutions, incubators, and specialized accelerators.

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The Statistical Tests

The experimental method was used to prove the following alternative hypotheses of the study: H1: There is a significant impact of the curriculum content of course on the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation among the students of Jordan University of Science and Technology.

> *H1: There is a significant impact of the curriculum content of "Entrepreneurship and Innovation" in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects among students of Jordan University of Science and Technology*.

Two questions were raised:

Are there statistically significant differences at α=0.05 between the curriculum content of "*Entrepreneurship and innovation*" in the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation, and the impact of the curriculum content of entrepreneurship and innovation in the acquisition and formation of principles, methods and strategies used in the implementation and application of entrepreneurial projects level among the students due to gender and the level of the study?

To answer the hypotheses and questions of the study, the researchers analyzed the data collected using a set of statistical methods such as Independent Samples Test, t-test, One Way ANOVA within the statistical analysis program (SPSS).

The Study Population

The study population consisted of all students of the Entrepreneurship and Innovation Course for the summer season of 2018/2019. The study population reached 832 male and female students. The number of male students was 322 (39.71%), while the number of female students was 510 (61.29%). The sample of the study by academic year was as follows: first-year students represented 357(42.91%) of the study sample, second-year students account for 360 (43.26%), while the rest of the years constituted 115 (13.83%) of the study population involved.

Building and Implementation of the Test

The researchers designed a test (before and after) to achieve the objectives of the study. The test contained a range of demographic characteristics, and consisted of two main dimensions: Dimension I: The impact of the curriculum of entrepreneurship and innovation in the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation. This dimension consists of twenty-six statement. The following are samples of them:

- I have a little knowledge about entrepreneurship, and its programs.
- I can differentiate between a successful entrepreneur, and a small business owner.
- I am convinced of the importance of entrepreneurship and innovation in building and supporting the economy.
- I read some books and articles on entrepreneurship and creativity.
- I like to see the success stories of entrepreneurs, and I know a lot of them.
- My goal at the professional level is to have my own entrepreneurial project.

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- Dimension II: The impact of the curriculum of entrepreneurship and innovation in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects. This dimension consists of fifteen statements. The following are samples of them:
- I have sufficient scientific knowledge on how to conduct high quality assessment research for any innovative entrepreneurial idea.
- I have the scientific and practical knowledge needed to plan to start my entrepreneurial project.
- I have the ability and willingness to apply the "*innovative business model*" to the idea of my entrepreneurial project.
- I have the ability and desire to design a "*business plan*" for my entrepreneurial project.
- I have the ability to design a "*Feasibility study*" for my entrepreneurial project.
- I have knowledge about some incubators and business accelerators that embrace entrepreneurial projects.

The Likert scale was used to measure the total score of these statements according to each dimension. This is a five-fold scale, namely: totally agree, agree, not sure, not agree, totally not agree.

Virtual Scale Honesty

This refers to judgment on the virtual test according to its words clarity and meaning in the light of the dimension to which it belongs. The test was judged by some specialists in entrepreneurship and creativity, who have indicated the appropriateness of the proposed data for the test by revising some statements. Moreover, the stability of the test was obtained by extracting the stability parameters of the scale used in the internal consistency method by calculating the stability coefficient using the Cronbach-Alpha equation. The total value of stability coefficients for all paragraphs reached 0.946, which are acceptable and indicated the stability of the study. Sekaran (1984) asserts the quality of this measure if Cronbach alpha exceeds 60.0. Hence, it is valid to measure what is assigned to its measurement.

Implementation the test

The researchers applied pre-test to a study community in the second lecture of semester (11/6/2019) of the course before introducing the curriculum. The post-test was carried out in the last lecture of the semester (29/7/2019).

RESULTS AND DISCUSSION

This section presents and discusses the results of the study. The results were as follows: First: To prove the following research hypotheses: There is a significant impact of the curriculum content of "*Entrepreneurship and Innovation*" in the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation among students of JUST, and there is also a significant impact of the curriculum content of entrepreneurship and innovation in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects among students of JUST. Two Independent Samples Test were used to demonstrate the nature of the relationship between the research hypotheses and the results of the test (before and after) when it is statistically significant (α=0.05). This can be seen from Table 1 below.

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Table 1
INDEPENDENT SAMPLES TEST TO DEMONSTRATE THE NATURE OF THE RELATIONSHIP BETWEEN THE RESEARCH HYPOTHESES

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Curriculum content in the construction knowledge and formation of b concepts entrepreneurship innovation	Equal variances assumed	7.514	0.006	1.556	1662	0.12	0.07	0.045	-.018-	0.158
	Equal variances not assumed			1.54	1319.37	0.124	0.07	0.045	-.019-	0.159
Curriculum content in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects	Equal variances assumed	12.108	0.001	2.632	1662	0.009	0.122	0.046	0.031	0.213
	Equal variances assumed			2.575	1268.71	0.01	0.122	0.048	0.029	0.216
all_var	Equal variances not assumed	4.497	0.034	-3.956-	1662	0	-.13041-	0.03297	-0.19507-	-.06575-
	Equal variances not assumed			-11.139-	1660.26	0	-.29714-	0.02667	-0.34946-	-.24482-

The results of the analysis of the Independent Samples Test (Table 1) revealed that there are statistically significant differences for the first hypothesis. It is attributed to the test (before and after), where the value of sig=0.006, which is less than the statistically significant (0.05). Accordingly, we accept the alternative hypothesis, which shows the existence of statistically significant differences. The results of the analysis also revealed that there are statistically significant differences for the second hypothesis. It is attributed to test (before and after), where the value of sig=0.001, which is less than the statistically significant (0.05). Accordingly, we accept the alternative hypothesis, which shows the existence of statistically significant differences.

There is a positive relationship between curriculum content of "*Entrepreneurship and Innovation*" and their positive impact in construction of knowledge and the creation of basic concepts in entrepreneurship and innovation and in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects among students of JUST. It can be attributed to a variety of causes and factors, and the most

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important of them are: Jordan's experience is relatively recent in entrepreneurship and innovation education and training; Jordanian school educational institutions lack any curriculum or content that addresses entrepreneurship and innovation; Recently, it has become in line with the developed world in the interest in education and training in entrepreneurship and innovation; JUST is one of the first educational institutions to offer a specialized course in entrepreneurship and innovation education. That was in the 2017/2018 school year. A group of universities and colleges nationwide then followed it chiefly because there is no education and training activity and previous experience and knowledge among students on the topics of leadership and innovation. This specialized curriculum, with its unique content, has left a cultural knowledge imprint, and many of the principles, methods, and strategies used in the implementation of entrepreneurship projects. The curriculum also offers unique scientific content, based on international curricula, which specializes in entrepreneurship education and innovation and are being taught in many universities and institutions of higher education in the United States, Britain, Canada, etc. The positive results of this analysis intersect with many studies that have examined the importance of specialized curricula in entrepreneurship and innovation education, especially among young people in university education (Kyle, 2005; Olokundun et al., 2017).

Second: Are there statistically significant differences at α=0.05 between the curriculum content of "*Entrepreneurship and innovation*" in the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation, and the impact of the curriculum content of "*Entrepreneurship and Innovation*" in the acquisition and formation of principles, methods and strategies used in the implementation and application of entrepreneurial projects level among the students due to gender and the level of the study?

To answer this question, the t-test was used for two independent samples to examine differences according to the gender variable. Table 2 shows the results.

Table 2 t-test for independent samples between the curriculum content of entrepreneurship and innovation in the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation, and the impact of the curriculum content of entrepreneurship and innovation in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects level among the students due to gender.

Table 2
T-TEST FOR INDEPENDENT SAMPLES BETWEEN THE CURRICULUM CONTENT OF ENTREPRENEURSHIP AND INNOVATION IN THE CONSTRUCTION OF KNOWLEDGE AND THE FORMATION OF BASIC CONCEPTS IN ENTREPRENEURSHIP AND INNOVATION, AND THE IMPACT OF THE CURRICULUM CONTENT OF ENTREPRENEURSHIP AND INNOVATION IN THE ACQUISITION AND FORMATION OF PRINCIPLES, METHODS, AND STRATEGIES USED IN THE IMPLEMENTATION AND APPLICATION OF ENTREPRENEURIAL PROJECTS LEVEL AMONG THE STUDENTS DUE TO GENDER.

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	Df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Curriculum content in the	Equal	0.014	0.907	-.028-	1662	0.978	-.00074-	0.02631	-	0.0509

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construction of knowledge and the formation of basic concepts in entrepreneurship and innovation	variances assumed								.05235-	
	Equal variances not assumed			-.028-	1326.03	0.978	-.00074-	0.02656	-.05283-	0.0514
Curriculum content in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects.	Equal variances assumed	0.009	0.924	-2.571-	1662	0.01	-.08846-	0.03441	-.15594-	-.02098-
	Equal variances not assumed			-2.567-	1359.66	0.01	-.08846-	0.03446	-.15607-	-.02085-
all_var	Equal variances assumed	4.497	0.034	-3.956-	1662	0	-.13041-	0.03297	0.19507	.06575-
	Equal variances not assumed			-1.561-	1335.32	0.119	-.04460-	0.02857	-.10064-	0.0114

The results in Table 2 indicate that there are no statistically significant differences (α=0.05) among curriculum content and the construction of knowledge, and the formation of basic concepts in entrepreneurship and innovation according to gender. Based on the level of significance, reaching 0.907, which is greater than the significance level (0.05), we accepted the zero hypotheses that there are no differences. The results also indicated that there are no statistically significant differences (α=0.05) in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects according to gender. Based on the level of significance, reaching 0.924, which is greater than the significance level (0.05), we accepted the zero hypotheses that there are no differences.

Third: Are there statistically significant differences at α=0.05 between the curriculum content of "*Entrepreneurship and Innovation*" in the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation, and the impact of the curriculum content of entrepreneurship and innovation in the acquisition and formation of principles, methods and strategies used in the implementation and application of entrepreneurial projects level among the students due the level of the study?

To determine this, the One Way ANOVA analysis has been applied. The result of the analysis of variance is shown in Table 3 below.

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Table 3
ONE-WAY ANOVA DETERMINE THE RELATIONSHIP BETWEEN THE CONTENT OF THE CURRICULUM AND ITS IMPACT ON CONSTRUCTION OF KNOWLEDGE AND THE FORMATION OF BASIC CONCEPTS IN ENTREPRENEURSHIP AND INNOVATION, AND IN THE ACQUISITION AND FORMATION OF PRINCIPLES, METHODS, AND STRATEGIES USED IN THE IMPLEMENTATION AND APPLICATION OF ENTREPRENEURIAL PROJECTS LEVEL AMONG THE STUDENTS DUE TO THE LEVEL OF STUDY.

		Sum of Squares	df	Mean Square	F	Sig.
Curriculum content in the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation	Between Groups	0.747	2	0.374	1.368	0.255
	Within Groups	453.541	1661	0.273		
	Total	454.288	1663			
Curriculum content in the acquisition and formation of principles, methods and strategies used in the implementation and application of entrepreneurial projects	Between Groups	0.466	2	0.233	0.497	0.609
	Within Groups	779.269	1661	0.469		
	Total	779.735	1663			
all_var	Between Groups	0.49	2	0.245	0.77	0.463
	Within Groups	528.192	1661	0.318		
	Total	528.682	1663			

The results in Table 3 indicate that there are no statistically significant differences (α=0.05) among curriculum content and the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation according to the level of study. Based on the level of significance, reaching 0.255, which is greater than the significance level (0.05), we accepted the zero hypotheses that there are no differences. The results also indicate that there are no statistically significant differences (α=0.05) in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects according to the level of study. Based on the level of significance, reaching 0.609, which is greater than the significance level (0.05), we accepted the zero hypotheses that there are no differences.

It is possible to explain the lack of a relationship between the curriculum content of "*Entrepreneurship and Innovation*" in the construction of knowledge and the formation of basic concepts in entrepreneurship and innovation, and the impact of the curriculum content in the acquisition and formation of principles, methods, and strategies used in the implementation and application of entrepreneurial projects level among the students due to gender and the level of the study. This could be due to lack of interest in spreading the culture of entrepreneurship and innovation among students in different stages of education and members of society in general. It could as well be due to the lack of education system at the primary and secondary level at the state level of any curriculum or content of knowledge specialized in education and training in entrepreneurship and creativity. This has affected students' performance in subjects and programs related to entrepreneurship and innovation in university education.

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RECOMMENDATIONS

It is noticeable that the experience of Jordan in education and training in entrepreneurship and innovation is quite similar to the modern experience.

This is seen especially in offering specialized curricula of teaching entrepreneurship and creativity, such as the experience of Jordan University of Science and Technology. Entrepreneurship and creativity education and training are among the most important priorities for industrialized developed countries as well as developing countries. This is because of its primary role in contributions to economic and social development.

Based on the findings of this research, we recommend the following:

- Provision must be made for more specialized academic curriculums in education and training in entrepreneurship and innovation, at the university and country level.
- It is better to rely on global curricula that are specialized in education, training, and development of entrepreneurship and innovation system, which have been applied and taught in the world's leading countries. The transfer of these distinctive experiences will contribute to development and save a lot of time.
- Specialized approaches of entrepreneurship and innovation should be developed to suit different levels of education.
- Further studies should be conducted on Jordan experience in adopting the entrepreneurship and innovation system at the national level.

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