

## Entrepreneurship and Innovation Culture in the Libya Higher Education Institutions: A case study in the Faculties of Economics and Engineering at the Universities of: Tripoli, Zawia, Gharyan, Tobruk and Sabratha

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### Abstract

*This study aims to assess the historical evolvement of entrepreneurship and innovation concepts in Libya. Also, it aims to investigate the entrepreneurship and innovation culture in the Libyan higher education institutions in six dimensions. Namely: academic staff, curricula, teaching methodology, administrative organization, support research projects, and the attitudes of academic staff toward this field in 2021. With the help of a descriptive approach (5-point Likert scale), findings revealed that the studied sample has many weaknesses in the field of entrepreneurship and innovation, particularly in the first five dimensions. While the only partially positive point was the academics' attitudes towards the entrepreneurship and innovation field dimension. This study provides valuable implications and suggestions for academics and policymakers.*

### Keywords

entrepreneurship and innovation, Cognitive Capital, Creative Thinking, knowledge - based economy, social entrepreneurship

### ثقافة ريادة الأعمال والابتكار في مؤسسات التعليم العالي الليبية

دراسة حالة على كليتي الاقتصاد والهندسة بجامعة (طرابلس- الزاوية- غريان- طبرق- صبراتة)

### الكلمات المفتاحية

الريادة والابتكار، رأس المال الفكري، التفكير الابداعي، الاقتصاد القائم على المعرفة، الريادة الاجتماعية

### الملخص

تهدف هذه الدراسة إلى التعرف على فلسفة ريادة الأعمال والابتكار والتطور التاريخي لها، بالإضافة إلى التعرف على واقع ثقافة ريادة الأعمال والابتكار في كليتي الاقتصاد والهندسة بجامعة (طرابلس- الزاوية- غريان- طبرق- صبراتة) في خمسة أبعاد هي: أعضاء الهيئة التدريسية، والتنظيم الإداري، والمناهج وآليات تطبيقها، وأوجه الدعم الفني والمالي، وميول أعضاء أعضاء الهيئة التدريسية لتبني فلسفة واستراتيجيات هذا المجال خلال سنة 2021م. بالاعتماد على المنهج الوصفي (مقياس لكرت الخماسي)، وأوضحت النتائج أن عينة الدراسة تعاني من العديد من نقاط الضعف في الأبعاد الأربعة الأولى المشار إليها سلفاً، بينما تمثلت نقطة القوة الوحيدة في بعد ميول أعضاء هيئة التدريس لتبني فلسفة واستراتيجيات هذا المجال. كما توصلت الدراسة إلى توصيات قيمة لكل من أصحاب القرار والباحثين.

## 1.1 Introduction

Change across the ages is considered a universal and social norm that occurs as an urgent reaction to meet ongoing development and growth in life. Ibn Khaldun is the first scholar who highlighted the inevitability in his introduction written at the end of the thirteenth century. He claimed that the conditions of the world and nations do not constantly go stable. Instead, it is a transition from one state to another through ages (Ibn Khaldun, 2004). Undoubtedly, entrepreneurship is generally defined as a creative behavior leading to regeneration, modernity and innovation. It is also concerned with creating new activities and businesses that result in development and impressive outcomes. Therefore, entrepreneurship and innovation have become the central core of interest of many governments as it is regarded a critical element in accomplishing economic excellence and growth as well as establishing a creative environment. The impact of the Fourth Industrial Revolution and the development in the realm of digital economy and the common use of its terms, such as: Blockchain, robot, fintech, and the Internet of things, Self-driving vehicles, 3D printing, nanotechnology, and biotechnology, would exemplify the importance of entrepreneurship and innovation in this era (Klaus, 2016). From the education point of view, higher education institutions in any country are considered the fundamental base that leads to cognitive, economic and social development. Higher education institutions

went through a radical transformation across ages; it was revolutionized from the stage of traditional education that prevailed in the 15<sup>th</sup> century to the stage of research in the 17<sup>th</sup> century and then to the stage of community service during the last decades. These consecutive stages were achieved as a result of such efforts, most notably cultivating the culture of entrepreneurship and innovation in higher education institutions. The latter became the primary driving tool for development and change in most societies, especially Western ones, where the term of entrepreneurial universities emerged (Etzkowitz, 2004).

## 1.2 Research Problem

The Global Competitiveness Report 2015 indicated that Libya Universities' outputs neither meet the needs of society nor labor markets. Consequently, universities graduates in Libya unable to create job opportunities in the private sector (Global Competitiveness Report, 2015). This is confirmed by the World Bank's Dynamics report of the Labor Market in Libya 2016, the latter stated that the employment rate in the public sector in Libya is estimated at 84% in 2012, while this percentage has increase to around 88% in 2021, according to the Libyan Financial Ministry. In the same vein, Libya has been completely absent from the Global Innovation Index for the last three years (the Global Innovation Index 2019, 2020, 2021). This index assesses the effectiveness of entrepreneurship and innovation policies in the economies worldwide based on eighty measures, including the education system.

Since the education system, especially higher education, is the backbone for bringing change and development to society, it has become of paramount importance to study and analyze the field of entrepreneurship and innovation in Libyan HEIs Universities to identify and tackle its problems. To this end, the problem of the study can be summarized in the following questions: What is the reality of entrepreneurship and innovation in terms of academic staff, curricula and teaching methodology, administrative organization, and support research projects in the studied sample? Besides, what are the attitudes of academics toward entrepreneurship and innovation field in the same sample?

### 1.3 Objectives:

The aims of this study are:

1. To understand the philosophy and concept of entrepreneurship and innovation and its historical evolvement.
2. To identify the reality of entrepreneurship and innovation culture at the level of administrative organization, academic staff, curricula and teaching methodology and support research projects.
3. To explore academics' attitude to draw on the field of entrepreneurship and innovation.

### 1.4 Importance:

entrepreneurship and innovation field are regarded a key driver of creating job opportunities for youth and boosting economic growth on one hand (Akhuemonkhan et al, 2013). Libyan HEIs Universities, on the other hand, are the major

sector that can equip youth with the entrepreneurial and innovative knowledge and skills. In other words, the presence of main aspects in the field of entrepreneurship and innovation in Libyan Universities at the level of academics, curricula and teaching methodology, administrative organization and support research projects will have a positive effect on the outcomes of Libyan Universities. For instance, academics with entrepreneurial mindset and such teaching methodology will equip the students with the knowledge and skills needed to establish their own startups, thus creating impactful economic growth. To the best of our knowledge, there are very few start-ups in the Libyan economy and this can be attributed to the weakness of Libyan Universities in the field of entrepreneurship and innovation. Therefore, it is essential to identify the level of embodiment that Libyan Universities have in the field of entrepreneurship and innovation in the aforementioned aspects, in addition to investigating academics' attitude to draw on this field. The result and recommendations of this study, which is the first of its kind, will be a basis for prompting entrepreneurship and innovation field not only at the level of Libyan University but also policymakers in higher education institutions, which, in return, will have a positive effect on enhancing the outputs of these institutions to entrepreneurial opportunities based on the knowledge economy in Libya.

### 1.5 Hypotheses:

H1: High awareness of entrepreneurship and innovation among academics.

H2: Curricula of entrepreneurship and innovation field is existed.

H3: Well administrative organization in entrepreneurship and innovation field.

H4: Good support for researches in the entrepreneurial and innovative field.

H5: Academics have a positive attitude to draw on entrepreneurship and innovation field.

### 1.5 Research Methodology

Quantitative descriptive research method is used in this study. Additionally, data is gathered based on a questionnaire which had designed and distributed electronically.

### 1.6 Literature Review

Several studies have been conducted in the realm of entrepreneurship and innovation. For example, in Sadia kingdom, & الحمالي (العربي 2016) found a fragility in the entrepreneurship unit and the policies of entrepreneurship from the academic staff's point of view in a study conducted at Hail University. Introducing holistic strategic plan, entrepreneurship materials and enhancing the efficiency of entrepreneurship unit are the most vital recommendation of the study. Also, Olorundare and Kayode (2014) conducted a study, entitled Entrepreneurship Education in Nigerian Universities, to explore the impact of entrepreneurship on graduates. Findings revealed that Nigerian Universities encounter many challenges such as the lack of entrepreneurship culture among academic staff members, the difficulty of

developing and teaching entrepreneurship courses and the scarcity of qualified trainers in the field of entrepreneurship and innovation. Furthermore, the study suggested a model of developing collaboration between the private and public sectors through entrepreneurship in education at Nigerian universities so as to bring a national change in the Nigerian economy. Teerijoki and Murdock (2014) conducted a study to assess the impact of the Danish training program within three universities in Denmark. The program aimed at disseminating the concept of entrepreneurship among academics and provide them with entrepreneurial skills, methods and techniques. Thereby, they can teach entrepreneurship to students through various instructional activities. Findings demonstrated that the program positively influenced the academic staff's perception and attitude towards entrepreneurship. Teerijoki and Murdock (2014) conducted a study to assess the impact of the Danish training program within three universities in Denmark. The program aimed at disseminating the concept of entrepreneurship among academics and provide them with entrepreneurial skills, methods and techniques. Findings demonstrated that the program positively influenced the academic staff's perception and attitude towards entrepreneurship. Last, (Varblane and Mets, 2010) studied the entrepreneurship education in European countries that were experiencing post-communist transition to identify the main trends and best practices of entrepreneurship education in 22 European countries during the economic development transition. The study concluded that Croatia and Slovenia were the two leading countries in terms of including entrepreneurial materials and activities concerning entrepreneurship in curricula and programs taught at universities

and colleges, followed by the Baltic States and the Czech and Slovak Republics. Furthermore, the results found that entrepreneurship is taught theoretically and the practical applications are somehow limited. Moreover, it was also found that the number of entrepreneurship centers in the region is relatively few.

According to the discussion above, it is crystal clear that the majority of studies evaluated the ability of academics in teaching entrepreneurial. However, these studies did not study the entrepreneurship and innovation culture of academics in addition to their attitude to draw on this field. Therefore, this paper contributes to the context of entrepreneurship and innovation field by exploring the entrepreneurship and innovation culture among academics, in addition to other dimensions at the Libyan higher education Institutions.

The remainder of this paper is structured as follows: Chapter II highlights the philosophy, concept and historical stages of entrepreneurship. Chapter III devoted to results and discussion. While chapter IV concludes the results and recommendations.

## 2.1 Philosophy, concept and historical evolving of entrepreneurship and innovation

The concept of entrepreneurship was presented as the driver of the economic growth, business success and market development (Gerçeker et al, 2014). According to the term of the political economy philosopher Joseph Schumpeter (creative destruction), introducing new ideas, modern methods and models and new products depending on Individual

entrepreneurs (Josef Schumpeter, 1934). Traditionally, new model emerged known as small and medium-sized companies (SMEs) (Beck et al, 2005) and this model advocated many countries to espouse national and regional economic policies that enhance the establishment of SMEs (Fischer and Nijkamp, 1988; Sternberg, 2012). In Fact, many of these policies and attempts failed to convert this model into a sustainable economic system because it is believed that SMEs are an economic activity that relies exclusively on narrowing groups of ambitious entrepreneurs (Wong et al, 2009, 2011; Stam et al, 2005) and this is considered incorrect interpretation of the entrepreneurial model. For instance (Carland et al., 1984) stated that,

Although there is an overlap between entrepreneurial firms and small business firms, they are different entities (Carland et al., 1984, 354).

According to the modern conception of entrepreneurship, entrepreneurs are defined as individuals who have entrepreneurial mindsets, introduce new ideas, and explore promising opportunities and new markets by which they can establish new businesses, create innovate solutions, invest resources, establish ventures, network with stakeholders and accept failure that result in creating a new environmental concept called "Entrepreneurship Ecosystem" (Josef Schumpeter and Peter Drucker, 1934, 1985). This new model adopted by most OECD countries as the policies of the

Entrepreneurship Ecosystem have been considered as the driver of economic growth and the major tool of intellectual and social transformation towards the knowledge economy (Isenberg, D. J. 2010; Drucker, P. F. 1985). It is a business system consisting of a harmonious group of interconnected elements that work systemically to produce entrepreneurship atmosphere, enhance and increase opportunities of innovation among both individuals and organizations to produce a new value in society (Isenberg, D. J. 2010).

Until the end of the 1970s, the classical growth models disregarded entrepreneurship and removed its characteristics related to knowledge; considering knowledge as an external factor. Nevertheless, with the passage of time, the current growth models have reintroduced the concept of entrepreneurship as the driver for the growth of knowledge economy. So, the society's ability to increase its capital and well-being over time fundamentally relies on its capability of growing, utilizing and disseminating knowledge and transforming it into economic value which, in return, achieves economic development. The most prominent phase in the development of mankind was preceded by discontinuous or constant increases of knowledge and technical progress. After each stage of knowledge development, it was found that economic development is characterized by uncertainty, new market experiences, redistribution of capital, and the emergence of new structures and industries. This pattern reflected the development that occurred during the 1<sup>st</sup> and 2<sup>nd</sup> industrial revolutions in

the 18<sup>th</sup> and 19<sup>th</sup> centuries and it has been also considered a prominent feature of the 3<sup>rd</sup> information revolution and the 4<sup>th</sup> industrial revolution (Klaus, 2016).

Knowledge plays increasingly a key role in economic and social development across history. It has also become the active force in developed economies, while our understanding of how knowledge formed, generated, disseminated and transformed into a growing knowledge economy is still fragmented and weak in developing countries. Our role in knowledge investment is still restricted to the use of traditional methods of education at all levels or by importing technology as integrated units and operating them without the ability to maintain and develop this technology. Developing countries consider that knowledge are a commodity that can be imported like any technical product and ignore that knowledge is an intellectual product that basically depends on the ability of individuals to produce it, regardless of their gender, color, race and religion. On one hand, development of knowledge is the outcome of fruitful cooperation done thought sharing, education, creation, innovation and scientific research. On the one hand, how to convert it into economic and social value by developing entrepreneurial skills to apply the cumulative knowledge of society, which is the missing code that we could not decipher as we were unable to create the appropriate knowledge and research environment to empower Libyan professors and researchers who studied at the most universal universities and knowledge centers to be able to invest their

knowledge in developing the role of the Libyan University as a leading institution for knowledge and technology production alike.

By assessing the knowledge growth in Libya, it is found that the education institutions in Libya is not up to date and it has been encountering society and culture challenges. It is moreover found that there are no strategies or policies that ensure knowledge production or keep pace with knowledge and technological development in the world (Unigov project, 2016). Based on the QS world university in 202, there are no Libyan universities among the first 4000 universities within other international superior rankings, nor among other international superior rankings. This is evidently seen that such a chronological gap between Libya and the world in many educational models, courses, legislations and advanced technological applications (e.g. quality, electronic management, e-learning, electronic payment, e-marketing, intellectual property, the national system for innovation, business incubators and accelerators, Innovation centers, venture finance, crowd funding, social responsibility, social entrepreneurship, social innovation, public-private partnership, technology cities, knowledge parks, industrial cities, smart cities, airports, ports, roads, hospitals, advanced markets, renewable energies, artificial intelligence, data centers, huge data systems, etc.). To clarify the latter, although there are many universities, research centers and technology institutes, in the all Libyan cities, that have more than 500 thousand students (intellectual capital), more than 25000 professors with

international education background (knowledge store) and thousands of graduates from universities and higher institutes (prospective professionals) and the availability of advanced laboratories, media and communication networks and electricity services throughout the country (Report on Statistical Indicators for Education in Libya 2018, 2019). Albeit, we are still far behind the realm of entrepreneurship and innovation.

Knowledge economy is a holistic developmental concept (System approach) and the universities or/and the scientific and research elites are not only the responsible for the failure in building the knowledge economy in the country. It is rather the responsibility of policy and decision makers in both the government and the business sector in particular. More generally, it is the responsibility of the whole society in general because wherever the society is, education, healthcare system, development and environment are accomplished (Isenberg & Onyemah, 2016).

With the emergence of the concept of intellectual capital and its noticeable role in establishing the knowledge economy in many countries, scholars, policy makers and decision makers' thinking and perception has shifted from focusing on tangible assets to concentrating on intangible assets (Tacit assets). In this respect, the economy depends on raw materials has turned into the economy based on intellectual capital and knowledge, which has been with the beginning of the 21<sup>st</sup> century a crucial turning point in global development. This transformation has

caused a cultural, social and economic development and has become the main driver for the global economic competition (Xu & Li, 2019). Entrepreneurship skills, innovation, communication and information technology, and efficient human resource have played a vital role in this transformation by triggering the culture of entrepreneurship in society and integrating it into the economic activities of the country, especially in the educational system. In addition, the aforementioned elements have strengthened the role of universities and research centers to become a producer of knowledge and technology and a major source of inventions and startups.

Prior to discussing the teaching of entrepreneurship in details, it is of great important to know what entrepreneurship is and how it is related to innovation. This salient question has remained unknown in our society and, so far, has not been adequately researched. Thus, entrepreneurship and innovation in our society is still a black hole with ambiguous concepts and it is often viewed as overlapping concepts.

## 2.2 Entrepreneurship Concept:

The concept of entrepreneurship as a driving force for production, development and change. It was first introduced by the American economist Mark Thornton in his interpretations and introduction of the concept of market economy (Cantillon & Murphy, 2015). Thornton's explanation of market economy later led to the formulation of the first complete economic theory known

as "The Wealth of Nations" (Smith, 1776). Furthermore, with the beginning of the 18<sup>th</sup> century, the French economist, Jean-Baptiste Say, used the term "entrepreneur" which is rooted from a French word "entrepreneur". He defined entrepreneurship as an adventure and effort made to establish a new valued entity in society. The concept of entrepreneurship continued to develop over time and began to spread by the Austrian political economist Joseph Schumpeter (1934) in his book "Capitalism, Democracy and Socialism". Joseph pointed out that an entrepreneur has four main characteristics; (1) a creator who introduces a new idea to solve a problem or develop a product; (2) the entrepreneur who is effectively and efficiently marketing this new idea; (3) an investor who take the risks of financing the innovation projects; (4) The manager who makes the decision and undertakes the daily administrative work. More broadly, the entrepreneur is the individual, who has a strong will, thinking and the ability to take risks, lead, make decisions, challenge failure and create value in society. Drucker (2014) pointed out that entrepreneurship is not an individual or economic activity; it is rather a life-like intellectual system that basically depends on investing individuals' creative and intellectual abilities to invent solutions and create societal value. Such expertise and abilities are not inherited; however, it is life skills and methods of resources management that can be taught to individuals at an early age. Based on this concept, new terms has emerged, namely; Entrepreneurial Thinking, the Entrepreneurial University, the



Entrepreneurial Enterprise, the Entrepreneurial State and the Entrepreneurial Society. So, entrepreneurs not only seek to identify profitable economic opportunities but also set to take risks, challenge failures, develop business performance, create startups, enhance large companies' business and create value in society (Drucker, 2014).

Carlsson (1999) presented two explanations for this economic transformation; notably, global competition and the impact of technological progress in the industrialized countries. In this regard, the Regional Entrepreneurship Development Index (REDI, 2013) indicated that the shift from economy based on traditional management to an entrepreneurial economy is one of the most significant challenges faced by advanced economies over the past four decades. This shift was linked to the increasing importance of intangible capital, such as human and intellectual capital employed for wealth creation. The most prominent signs of this transformation were the aggregate use of knowledge as a major driving force for economic growth and as an alternative to physical capital and natural resources. Carlson also individuals, not large corporations, as entrepreneurs who create new knowledge, startups and small businesses that play a dominant role in turning new knowledge into goods and services with economic and social value. He furthermore called for replacing traditional industrial policy and antitrust monopoly laws as well as protecting small business with a broader entrepreneurship policy that aims to establish and improve entrepreneurship

ecosystem in general and encourage innovation and business environment of growing startups in particular.

The concept of integrating entrepreneurship in education motivated and enthused makers of economic and development policy and decisions in the last two decades, either in governments or/and international organizations (Kuratko, 2005). This concept had a great positive effect on society, such as economic growth, job creation, social harmony, technological development, the development of individuals 'capabilities and skills, improvement of the income levels, increasing the participation of vocational institutions and universities in social and economic development and enhancement the services level in societies (Carree & Thurik, 2010). On the flip side, embodying the concept of entrepreneurship in education system has brought various challenges due to many reasons such as: the lack of knowledge and resources, the inconsistency of stakeholders, the change resistance by academics of this trend, the absence of the integrative relationship between educational institutions and society that contribute to the success of this initiative in education to name but few (Jafari et al, 2012)

When discussing the idea of entrepreneurship in education, it is found that the concept is very different from what many officials or/and professors think; some of them see the concept on integrating entrepreneurship in education as teaching entrepreneurship to students so as to establish their startup businesses. Nonetheless, this view is a rather

narrowing definition of entrepreneurship. On the other hand, other professionals and officials interpret entrepreneurship as creating a learning environment that enables students to be more creative and encourages them to identify and seize opportunities and come up with innovative solutions through self-reliance and risk-taking in order to address the problems affecting their communities. And this is the right interpretation which had a positive influence on the developed countries' economic. In the same line, Peter Drucker, the philosopher of entrepreneurship in the modern era, explained that entrepreneurship is a way of thinking, a concept of management, a leadership style of institutions and it is a fundamental element to the success of any person and organization (Drucker, 2014). In recent years, the definition of entrepreneurship has evolved to cover all aspects of life known as Social Entrepreneurship (Porter & Kramer, 2019).

According to the global competitiveness report 2015, several constraints have been facing the Libyan education institutions, most notably to align their outcomes with the needs of labor market in private and public sector and this is attributed to the strategic relationships between the stockholders in this regard. By reviewing the experiences of many countries and participating in many programs and activities, workshops and conferences that were organized within the international support programs to Libya during the years 2013-2020 in the field of entrepreneurship as well as our experience in establishing entrepreneurship since 2005, it is

concluded that Entrepreneurship education is a common factor between these different methods and that all students have to be empowered to enhance their personal and cognitive talents and skills to create innovative solutions that add a value in their community and ,thereby students become aware that education is not limited to obtaining a certificate and finding a job. Thus, the core goal of educating entrepreneurship and innovation is to develop citizens' life, professional and creative skills that they increasingly need in this era, regardless of scientific specialization or career choice.

Entrepreneurship comes to the fore in education so far because, from the economic perspective, integrating entrepreneurship in education has well succeeded in improving the efficiency of graduates of higher education in all developed countries (Cera et al, 2020 & Mei et al, 2020). However, entrepreneurship education has encountered major challenges that require more efforts when teaching it at primary and secondary education. As for the third world countries and the Middle East countries, especially North African countries, the matter of entrepreneurship education is still brainstormed and discussed in formally by officials, parents and university professors. In addition, the officials and citizens continuously criticize the educational system when compared to international educational systems, especially at the university level related to labor market and scientific research.

Entrepreneurship in education is very important and exhilarating as it makes a radical shift at all levels of education. It also plays a crucial role in inspiring and motivating students and professors alike to unleash their intellectual abilities and latent skills (Tacit Knowledge) as well as making a fruitful interaction that would definitely lead to development of their societies and engage them in deep learning (Mittal & Raghuvaram, 2021). Therefore, this study looks at the significance of including entrepreneurship in education and the necessity of doing this integration gradually so as not to underrate its value and becomes a routine subject. It is important to place a focus on success and failure factors that must be considered and developed gradually over time in the education system.

The key factor in the success of entrepreneurship education is to implement effective methods that get students motivated and involved in creating solutions and producing unique values for their communities based on the knowledge and skills they acquire (Arasti et al, 2012). This consequently motivates both professors and students to use practical learning methods and techniques rather than passive learning. Moreover, this type of education will create an active leaning environment by which students have a strong interest, build a competence that enables entrepreneurial students to pursue elective training programs that aim to develop students' entrepreneurial mindset to building their start-up companies (Wardana et al, 2020; Piperopoulos & Dimov, 2015).

Launching entrepreneurship education is theoretically easy to achieve. However, in fact, it is practically challenging as it is related to early socialization rather than traditional education. It is possible to begin at an early age with a broad definition of entrepreneurship and embedded in the curriculum and relevant to all disciplines; preferably, at primary and middle school grades (Rina & Indriayu, 2019; Heilbrunn, 2010). This can be accomplished through enabling pupils to work at home or on the farm, assisting their parents and training them to work in groups to do homework and project-based learning (PBL). Entrepreneurship education is also achieved by including concepts of entrepreneurship and its applications in some course materials and school activities (e.g. school competitions and student camps and innovation clubs) that ensure teaching entrepreneurial thinking. Such activities are established and held at all educational and social institutions and they may operate within a parallel voluntary framework that focuses on activities of social, economic and environmental value (Saptono et al, 2021).

Many countries have set policies and plans to develop the realm of entrepreneurial and innovation. For instance, Iacobucci & Micozzi, (2012) stated that the number of entrepreneurial and innovation programs in American universities were about 130 programs in 1970, concentrated in the Faculties of economics and engineering. This number of programs had reached 370 in 1992, while it record about 1600 programs in 2012. In the same countries, the first business

incubator was established in New York (Batavia) in 1959, further, the number of business incubators grew to become 1115 in 1999, while this number of incubators reached 1250 in 2018 (مسيل محمود وآخرون, 2018). Also, according to the statistics of Organization for Economic Cooperation and Development (OECD), United State of America spent about 3.067% on research and development as a percentage of its GDP in 2019.

All of this may be theoretically explained; however, practically, the inclusion of entrepreneurship in education activities and programs at the public and higher educational institutions realistically does not exist, and this can be noticed through the absence of Libya from international indexes related to the innovation and entrepreneurship such as Global innovation index (GII) and Global Entrepreneurship Index during last years (GII, 2022; GEI, 2022). Albeit, there are few individual initiatives that focus on educating students on how to establish and start businesses. The initiatives' materials are not a part of curricula and do not provide students with skills and experiences required to convert knowledge into economic value, to find out the solutions to society's problems and to meet the labor market's need.

The development of students' entrepreneurial skills is perhaps the most difficult and critical issue in this matter. Many researchers argue that the only efficient way that makes people competent in entrepreneurship is through learning by practical and creative education (Chang et al, 2014; Anzai & Simon (1979).

In addition, most researchers greed that engaging students to work in multidisciplinary teams and helping them to interact with people outside the school or university is an effective way to develop entrepreneurial competencies among students (Fiore et al, 2019). However, if this type of experiential learning-based activities is to be categorized as an entrepreneurial method, then some kind of value must be created for people outside the university in the process and it is not adequate to interact with external stakeholders without clear social and development value. Specifically, in order for this approach to succeed, teachers have to rely on entrepreneurship education in which many educational tools and methods that aim to create a societal value.

### III Practical Framework.

#### 3.1 Research Design and Data Collection Tools

The researchers used the descriptive analytical research design to investigate the research topic. As a data collection tool, they designed questionnaire to gather the required data about the study problem. The questionnaire falls into five themes based on the Likert scale. Each theme is divided into a set of statements based on the theoretical part of this study.

#### 3.2. Study Population

The study population was represented by academic staff members in the faculties of economics and engineering at the universities of Tripoli, Zawia, Gharyan, Tobruk, and

Sabratha. The researchers targeted engineering and economics departments at the mentioned universities because the majors of engineering and economics are highly relevant to entrepreneurship and innovation. The questionnaire was distributed electronically via e-mail, the website, and the target universities' social media pages. The number of completed questionnaires was 295 (see table 1):

Table 1 :Distribution of Study Population

| No    | University             | Number of Questionnaires |
|-------|------------------------|--------------------------|
| 1     | University of Tripoli  | 74                       |
| 2     | University of Zawia    | 83                       |
| 3     | University of Gharyan  | 50                       |
| 4     | University of Tobruk   | 33                       |
| 5     | University of Sabratha | 55                       |
| Total |                        | 295                      |

### 3.3. Data Encoding

The collected data was encoded by the numerical method (Likert scale) as shown in table 2 below:

Table 2: 5 Point Likert scale

| Level of Agreement | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|--------------------|-------------------|----------|---------|-------|----------------|
| Numbering          | 1                 | 2        | 3       | 4     | 5              |

| Range | 1-1.80 | 1.81-2.60 | 2.61-3.40 | 3.41-4.20 | 4.21-5 |
|-------|--------|-----------|-----------|-----------|--------|
|-------|--------|-----------|-----------|-----------|--------|

As it is shown in table 2, the average level of agreement is (3) and if the mean of the responses to statements is significantly higher than (3), this indicates a high level of agreement. On the other hand, if the mean of the responses to statements is significantly less than (3), this indicates a low level of agreement. Moreover, if the mean of the responses does not differ significantly from (3), it indicates that the level of agreement is medium. Also, the above table shows the range of cell length for the study scale used in this study. The Statistical Package for the Social Sciences (SPSS) was used in analyzing the data. The results obtained from the data analysis process are as follow:

### Results and discussion.

#### 3.4 Cronbach's alpha ( $\alpha$ ) test results for validity and reliability

Cronbach's alpha test ( $\alpha$ ) is a statistical test that measure internal consistency (reliability) of the samples' responses to Likert questions in the questionnaire. It is used to ensure that the result is reliable. More specifically, when the values of Cronbach's alpha coefficient are greater than (80%), it indicates that there is a high internal reliability in the responses to the questionnaire statements and, thereby, the researchers can rely on the data collection tool (questionnaire) and its responses to achieve the study objectives (Domino & Domino, 2006).

Table 3 shows the values of Cronbach's alpha coefficients ( $\alpha$ ) and the consistency coefficients' values were 85.4 % and 92.4% respectively. That is, there is an internal

reliability in the responses to the questionnaire themes and, thereby, the researchers can rely on these responses to

achieve the study objectives and analyze the study results.

Table 3: Cronbach's alpha test results for validity and reliability

| No   | Themes  | Alpha Coefficient | Consistency Coefficient |
|--|---|-------------------|-------------------------|
| 1  | Theme I: The reality of entrepreneurship and innovation (academic staff members).   | 82%               | 90.7%                   |
| 2  | Theme II: the reality of entrepreneurship and innovation (curricula).   | 85.4%             | 92.4%                   |
| 3  | Theme III: the reality of Entrepreneurship and Innovation (administrative organization)   | 86 %              | % 92.8%                 |
| 4  | Theme IV: the reality of entrepreneurship and innovation (the academics' attitudes in higher education institutions to adopt the concepts and strategies of entrepreneurship and innovation). | 92 %              | % 96%                   |
| 5  | Theme V: the reality of entrepreneurship and innovation (technical and financial support)   | 81 %              | 90 %                    |
| The mean of Cronbach's alpha test's results for all study themes |   | 85.4 %            | 92.4 %                  |

### 3.5 Characteristics of Study Samples

The respondents of this study were academic staff members in the faculties of economics and engineering at the universities of Tripoli, Zawia, Gharyan, Tobruk and Sabratha. Figure 1 shows the percentage of responses from each university.

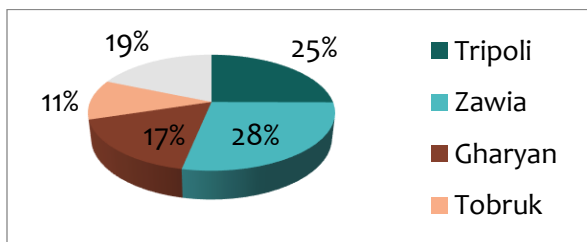


Fig. 1. Distribution of the responses according to universities

Figure 2 shows the percentage of male respondents in the study sample which was 67% while the percentage of female respondents was only 23%. Authors attribute this to the high percentage of male in Libyan universities.

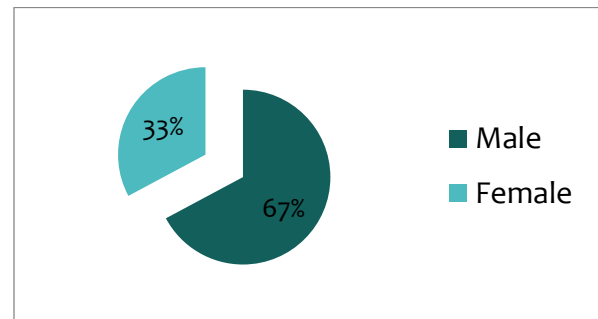


Fig. 2. Distribution of the study sample by gender

In addition, Academics with PhD and M.Sc. took part in the study with equal percentage

of approximately 50% for both. It is known that during the last decades the scholarship for PhD has decreased after 2011 so the number of master degrees are on the increase in Libyan and this is may one of the behind the increase in master degree holders in the sample (see Figure 3).

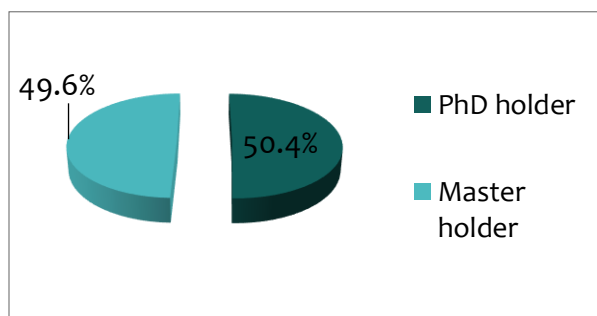


Fig. 3. Distribution of the study sample according to the scientific degree

To this end, the following part of the study is testing the hypotheses of the study. More specifically, the first variable of the study is academic staff, this dimension consists of 7 statements. Second variable is curricula and teaching methodology consists of 7 statements. While, third, forth and fifth dimensions are administrative organization, support research projects and the tendency of

academics towards entrepreneurship and innovation field with statements of each dimension 7, 4, 7 respectively. More descriptive analysis for each dimension in the dedicated table.

Based on the central limit theorem which states that the sampling distribution of the mean will always follow a normal distribution if the sample size is sufficiently large and this condition is usually met if the sample size is  $n \geq 30$ . Accordingly, authors assumed that the data is normally distributed as the size of our sample is 295 (Holmes, 2021).

### 3.6 Test of Study Hypotheses

3.6.1 Hypothesis 1: High awareness of entrepreneurship and innovation among academics.

Entrepreneurship and innovation culture among academic staff members is a crucial variable for this field. The following table demonstrates to what extent the study sample is aware of entrepreneurship and innovation field.

Table 4: Results of the t-test of questionnaire statement on the reality of the culture of entrepreneurship and innovation

| No | Statement   | Mean | Mean percentage | S. D | Significance level | Ranking |
|----|---|------|-----------------|------|--------------------|---------|
| 1  | You are well knowledgeable of the concept of entrepreneurship and innovation. | 3.70 | 0.74            | 0.85 | 0.000              | 1       |

|   |   |             |             |             |              |          |
|---|---|-------------|-------------|-------------|--------------|----------|
| 2   | You are well aware of some terminology related to entrepreneurship and innovation (e.g. entrepreneurial ideas, entrepreneurial opportunities, business models, design thinking, start-ups, venture finance, crowd funding, social entrepreneurship, social innovation, entrepreneurial university). | 3.35        | 0.67        | 1.08        | 0.000        | 2        |
| 3   | You have a good knowledge of interactions between academia (the university), industry and government to boost economic and Social development (Triple helix).   | 3.23        | 0.65        | 0.95        | 0.005        | 3        |
| 4   | You have participated in several scientific meetings and awareness programs on entrepreneurship and innovation (e.g. workshops - conferences - seminars - competitions).  | 2.97        | 0.59        | 1.13        | 0.763        | 4        |
| 5   | You have contributions/participations in the activities of the Global Entrepreneurship and Innovation Week.   | 2.41        | 0.48        | 1.07        | 0.000        | 6        |
| 6   | I have published, at least, one scientific paper on entrepreneurship and innovation.  | 2.24        | 0.45        | 1.29        | 0.000        | 7        |
| 7   | You motivate and supervise students' graduation projects in the field of entrepreneurship and innovation.   | 2.70        | 0.54        | 1.14        | 0.003        | 5        |
| <b>Dimension 1: Academic staff members.</b> |   | <b>2.94</b> | <b>0.59</b> | <b>1.07</b> | <b>0.110</b> | <b>2</b> |

Table 4 reveals that the calculated significance of the all responses to the statements of this theme is  $<(0.05)$  with the exception of the fourth statement. It is also noticed that the level of agreement is high for the first three statements, so we reject the null hypotheses for the first three statements and accept the alternative hypothesis. That is, the study sample showed that the academic staff members is familiar with the concept of entrepreneurship and innovation as well as some concepts related to this topic such as entrepreneurial opportunities, venture financing, social entrepreneurship, social innovation, in addition to their good level of knowledge of the pillars of the knowledge-based economy, government, university and

business sector (Triple helix). On the other hand, the rest of the responses to the statement showed different levels of disagreement and this indicates the academic staff members do not participate in entrepreneurship activities, do not publish research papers in the field of entrepreneurship and innovation, and do not motivate and supervise students graduation projects in this field. Accordingly, the null hypothesis can not be rejected for the last three sentences

3.6.2 Hypothesis 2: Curricula of entrepreneurship and innovation field is existed.



The Curricula of Entrepreneurship plays an essential role in developing practices related to entrepreneurship and innovation. Table 5

demonstrates the availability of entrepreneurial courses and topics in the curricula.

Table 5: The results of the t-test of the study sample's responses related to curricula

| No                            | Statement   | Mean        | Mean percentage | S. D        | Significance level | Ranking  |
|-------------------------------|---|-------------|-----------------|-------------|--------------------|----------|
| 1                             | Entrepreneurship and innovation course is taught at your institution.   | 2.52        | 0.50            | 1.10        | .000               | 6        |
| 2                             | There are topics related to entrepreneurship and innovation within the courses taught at your institution.  | 2.78        | 0.56            | 1.26        | .010               | 3        |
| 3                             | There are courses related to entrepreneurship and innovation at your department.  | 2.41        | 0.48            | 1.01        | .000               | 7        |
| 4                             | There are topics related to entrepreneurship and innovation within the courses taught at your department.   | 2.65        | 0.53            | 1.14        | .000               | 4        |
| 5                             | You have scientific sources and references related to entrepreneurship and innovation.  | 2.63        | 0.53            | 1.11        | .000               | 5        |
| 6                             | Your teaching method aims to provide students with scientific knowledge and practical skills in the field of entrepreneurship and innovation.   | 3.24        | 0.65            | 1.18        | .002               | 2        |
| 7                             | Your institution encourages the development of curricula so that it contains theoretical and practical activities, with the aim of motivating and developing students' entrepreneurial and innovative thinking and skills (e.g. case studies or practical field research to find solutions to existing problems or develop new services). | 3.33        | 0.67            | 1.31        | .000               | 1        |
| <b>Dimension 2: Curricula</b> |   | <b>2.79</b> | <b>0.56</b>     | <b>1.16</b> | <b>0.000</b>       | <b>3</b> |

It is clearly noticed from table 5 that the calculated significance of the all responses to the statements of theme 2 is <the level of significance (0.05). It is also seen that the level of agreement to this theme is generally low. Therefore, we accept the null hypothesis for the first five statements and this is evident that there is lack in courses or/and topics within the curricula taught at the target universities. In addition, the results showed

that there is a lack of scientific sources and references in this field. On the other hand, the level of agreement to the responses in the last two statements was high with a calculated significance <the significance level (0.05). That is, academic utilizes teaching methods that aim to provide students with scientific knowledge and practical skills and their institutions encourage them to develop

curricula in the field of entrepreneurship and innovation.

3.6.3 Hypothesis 3: Well administrative organization in entrepreneurship and innovation field.

Administrative organization plays a significant role in creating an entrepreneurial and innovation atmosphere in terms of deploying the required policies and creating plans that ensure entrepreneurship and innovation at the educational institutions.

Table 6 shows the result of this theme.

Table 6: The results of the t-test of the study sample's responses related to the administrative organization

| No  | Statement   | Mean        | Mean percentage | Standard Deviation | Significance level | Ranking  |
|---|---|-------------|-----------------|--------------------|--------------------|----------|
| 1   | Entrepreneurship and innovation are considered and essential part of the educational institution's strategy (vision - mission - goals). | 3.58        | 0.72            | 1.12               | .000               | 1        |
| 2   | Your institution has a department dedicated to organizing and monitoring entrepreneurship and innovation activities.                    | 2.79        | 0.56            | 1.14               | .005               | 2        |
| 3   | Your organization has a department specialized in the field of entrepreneurship and innovation.   | 2.64        | 0.53            | 1.07               | .000               | 5        |
| 4   | Your department has a division specialized in the field of entrepreneurship and innovation.   | 2.30        | 0.46            | 0.95               | .000               | 7        |
| 5   | There is an award for entrepreneurship and innovation, either for students or academics, at your educational institution.               | 2.50        | 0.50            | 1.05               | .000               | 6        |
| 6   | Your institution has a business incubator or/and a center of entrepreneurship and innovation.   | 2.87        | 0.57            | 1.22               | .107               | 3        |
| 7   | Your department has cooperation with stakeholders in the field of entrepreneurship and innovation (Business and Accelerators).          | 2.69        | 0.54            | 1.13               | .000               | 4        |
| <b>Dimension 3: administrative organization</b> |   | <b>2.77</b> | <b>0.55</b>     | <b>1.10</b>        | <b>0.02</b>        | <b>3</b> |

As it can be seen from Table 6, the mean of the all responses to the statements of theme 3 equals (2.77), which is less than average scale. i.e., 3, with a calculated significance of

0.02. Hence, the null hypothesis is accepted and the alternative hypothesis is rejected. This result indicates that the administrative

organization, at the targeted universities, is generally neglected in the sampled study.

3.6.4 Hypothesis 4: Good support for researches in the entrepreneurial and innovative field.

Table 7: The results of the t-test of the study sample's responses to the statements related to financial and technical support to entrepreneurial and innovative research projects.

| No  | Statement  | Mean        | Mean percentage | S.D         | Significance level | Ranking  |
|---|--|-------------|-----------------|-------------|--------------------|----------|
| 1   | Research and innovation projects are technically supported in your institution.  | 2.59        | 0.52            | 1.07        | .000               | 3        |
| 2   | Grants are awarded to entrepreneurial and innovative research projects in your institution.                                  | 2.34        | 0.47            | 1.02        | .000               | 7        |
| 3   | Businessmen are constantly informed with promising research and innovation projects of the graduates of your institution.    | 2.44        | 0.49            | 0.99        | .000               | 6        |
| 4   | Banks are urged and recommended to fund promising research and innovation projects of the graduates of your institution.     | 2.56        | 0.51            | 2.92        | .023               | 4        |
| 5   | The municipalities are urged to support the promising research and innovation projects of the graduates of your institution. | 2.51        | 2.51            | 1.05        | .000               | 5        |
| 6   | Entrepreneurship competitions are held annually or periodically.   | 2.78        | 0.56            | 1.09        | .002               | 1        |
| 7   | Prizes and incentives are awarded to outstanding entrepreneurial projects.   | 2.70        | 0.54            | 1.13        | .000               | 2        |
| <b>Dimension 5: Financial and Technical Support</b> |  | <b>2.56</b> | <b>0.51</b>     | <b>1.32</b> | <b>.004</b>        | <b>5</b> |

As it can be seen from table 7, the mean of the all responses to the statements of theme 5 is (2.49), which is less than the hypothesized mean (3), with a calculated significance less than (0.05). Therefore, the null hypothesis is rejected and the alternative hypothesis is accepted for this theme. This result shows that the technical and financial support to entrepreneurial and innovative research projects is weak at the targeted universities.

3.6.4 Hypothesis 5: Faculty members have positive attitudes to adopt the concepts and strategies of entrepreneurship and innovation.

The following table shows to what extent academic staff members, at the targeted universities, are likely to drown in the field of leadership and innovation.

Table 8: The results of t-test of the study sample's responses related to the statement of academics' attitude to adopt the concepts and strategies of entrepreneurship and innovation.

| No   | Statement  | Mean        | Mean percentage | S.D         | Significance level | Ranking  |
|--|--|-------------|-----------------|-------------|--------------------|----------|
| 1  | You have the desire to develop knowledge and professional skills in the field of entrepreneurship and innovation.  | 4.38        | 0.88            | 0.72        | .000               | 4        |
| 2  | You have the desire to improve the curriculum in compatible with entrepreneurship and innovation strategies.   | 4.41        | 0.88            | 0.72        | .000               | 2        |
| 3  | You have the desire to motivate and supervise students' innovative research projects.  | 4.39        | 0.88            | 0.75        | .000               | 3        |
| 4  | You are keen to change the teaching-learning methodologies from a theoretical framework to an experiential framework by which the students are engaged in real entrepreneurial learning process. | 4.43        | 0.89            | 0.72        | .000               | 1        |
| <b>Dimension 4: academic staff members' attitudes to adopt the concepts and strategies of entrepreneurship and innovation.</b> |  | <b>4.40</b> | <b>0.88</b>     | <b>0.73</b> | <b>.000</b>        | <b>1</b> |

Table 8 demonstrates that the mean of the all responses to the statements of theme 4 is (4.73) with a calculated significance less than (0.05). Thus, the alternative hypothesis is accepted. This

result indicates that the academic staff members, at the targeted universities, are interested to adopt the concepts and strategies of entrepreneurship and innovation.

### 3.6.5 Summary

Table 7: The results of the t-test on the mean of the dimensions of the all

| No | Statement  | Mean | Mean percentage | S.D  | Sig. level | Ranking |
|----|--|------|-----------------|------|------------|---------|
| 1  | Diminution 1: Academic staff members.  | 2.94 | 0.59            | 1.07 | .110       | 2       |
| 2  | Diminution 2: Curricula  | 2.79 | 0.56            | 1.16 | .00        | 3       |
| 3  | Diminution 3: administrative organization  | 2.77 | 0.55            | 1.10 | .02        | 4       |
| 4  | Diminution 4: Financial and Technical Support  | 2.56 | 0.51            | 1.32 | .004       | 5       |
| 5  | Diminution 5: academic staff members' attitudes to adopt the concepts and strategies of entrepreneurship and innovation. | 4.40 | 0.88            | 0.73 | .000       | 1       |

It is noted from Table 9 above that Diminution 1, the academic staff members' attitude to adopt the concepts and strategies of entrepreneurship and innovation, came to the first, which, in return, shed light on the high desire of academics to explore this field. This may be considered a

strength point that the higher education policy makers in Libya utilize for the development of entrepreneurship education. Additionally, the responses to the statements showed a level of disagreement to the other diminutions.

#### IV. Conclusion:

This study aims to investigate the entrepreneurship and innovation culture in the Libyan higher education Institutions in 2021, specifically, faculties of economics and engineering in the universities of Tripoli, Zawia, Gharyan, Tobruk and Sabratha. Five dimensions were tested, namely, academic staff, curricula and teaching methodology, administrative organization, support research projects and the attitudes of academic staff toward entrepreneurship and innovation field. With the help of descriptive approach (5-point Likert scale), The results obtained show that many weaknesses area are exist in the field of entrepreneurship and innovation in the sampled study. More deeply: Firest diminsion (academics), results revealed, strengly, that academics neither publish research papers nor well participation in entrepreneurship and innovation activities. Second diminsion, (curricula and teaching methodology), shows that there is lack of courses, topics in the curricula taught in the field of entrepreneurship and innovation. Third (administrative organization), results shows that this diminsion is neglected in the studied sample as there has been no departmet, or incubator specialized in the field of entrepreneurship and innovation. Also, the intraction with the stackholders is weak. Forth (supports research), results revealed that the support for entrepreneurial and innovative research projects is fragile. In the flip side, the strength point was found is the academics' desire to draw on the entrepreneurship and innovation field as they are quite knowledgeable in this field.

According to the above conclusions, the researchers provide a cluster of

recommendations. First, to raise the awareness of academics and equip them with the needed teaching skills by training programs. Also, increase academics' participation in entrepreneurial and innovative activities (e.g. conferences, symposiums, workshops, etc.) and publishing scientific papers. Second, is to introduce curricula with respect to entrepreneurship and innovation field. Third, intreduing and adopting new administrative organization policies pertain to entrepreneurship and innovation. Forth and last, is to mobilize and allocate a specific budget that accomplishes the objectives of entrepreneurship and innovation at Libyan universities

Based on the findings of the research, further researches are needed in the role of entrepreneurship and innovation for commercializing the knowledge in Libyan Universities.

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