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TYPOLOGY OF INNOVATION ECOSYSTEMS UNIVERSITY-BASED INNOVATION ECOSYSTEMS & ENTREPRENEURS IN THE UNITED ARAB EMIRATES

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ABSTRACT

Purpose- This paper explores the typology of innovation ecosystems obtained from the literature review which university-based innovation ecosystems in the United Arab Emirates (UAE) universities on the entrepreneurial subdivision of the innovation ecosystem and terms it an entrepreneurial ecosystem.

Methodology- The aims of this study is qualitative in nature, while reflecting its exploratory nature and the absence of any previous work on university Typology of innovation in the UAE. A list of all UAE universities from the Commission for Academic Accreditation (CAA) will be used as primary research. Secondary sources and used as a sampling frame. The sampling procedure involved contacting the universities or colleges.

Findings- The Centre of Excellence for Applied Research and Training (CERT) at Higher Colleges of Technology (HCT) Established in 1996 the first center to adopt entrepreneurial initiatives. The UAEU Science and Innovation Park (UAEU-SIP) and Start AD, NYU Abu Dhabi both established in 2016 as the first concepts of innovation and incubator centers in the UAE universities. The UAE Government and Local government are the biggest supporters of universities, and with limited support from the private sector. Due to the early stage of those incubators and centers, with building a skilled workforce with entrepreneurial mindsets, the outcomes of incubated startups are expected to emerge after some time.

Conclusion- This study focused only on universities located in the UAE which it's an emerging country. This study focused on university incubators or Innovation Centers only as introduced above more research is required on university-based innovation ecosystems' reach and strategic context.

Keywords: Entrepreneurial, Ecosystem, Typology of innovation,UAE, University-based innovation
JEL Codes: O30, O31

1. INTRODUCTION

The United Arab Emirates (UAE) was established on the 2nd of December 1971 and the first university to be established in 1977 was the UAE University. According to Commission For Academic Accreditation (CAA), there are around 111 universities and colleges in the UAE (CAA, 2022). While the primary mission of universities has historically been researching and teaching, it is becoming increasingly evident that universities have become an essential source of knowledge and institutions of enhancing capabilities. Universities have become aware of and acting on their role as contributors to economic and social development in a global, national, and regional manner. This role is often referred to as the universities' 'third mission' (Etzkowitz & Leydersdorff 2000; Gulbrandsen & Slipesæter 2007; Laredo 2007). During the last few decades, the number of universities extending their initial education and teaching missions towards the triple helix and knowledge triangle paradigms, e.g. knowledge and technology transfer and innovation has increased substantially. In line with this evolution, the term 'entrepreneurial university has now become very popular. However, until very recently, there is a very scant shared understanding of what is an 'entrepreneurial university.

The purpose of this study is to explore University-based innovation ecosystems in the UAE and how they impact the UAE innovation strategy. As the push to innovate and enterprise has increased, many UAE-based Universities and colleges have implemented Innovation centers and entrepreneurship incubators.

2. LITERATURE REVIEW

The United Arab Emirates (UAE) was established on the 2nd of December 1971 and the first university to be established in 1977 was the UAE University. The number of higher education institutions in the UAE has increased rapidly in the last 40 years. According to Commission For Academic Accreditation (CAA), there are around 111 universities and colleges in the UAE (CAA, 2022).

In October 2014, the UAE government launched the UAE National Innovation Strategy aims to stimulate creativity and innovation in the seven sectors 1) renewable energy, 2) transportation, 3) education, 4) health, 5) technology, 6) water, and 7) Space (Government of UAE, 2017). In the field of education, the strategy promotes innovation in education by providing students with 21st-century skills (e.g. critical thinking, problem-solving, creativity, innovation, perseverance, adaptability),

(UAE-Stanford Innovation & Entrepreneurship High Impact Project) initiatives for Prime Minister's Office in 2015, bridge the gap between academia and industry for the UAE ecosystem. More than forty-three universities in the UAE have participated with over one hundred UAE faculty and instructors having been trained. (Stanford University, 2015).

Ecosystems are described as innovation systems that dynamically evolve over time and consist of networks and clusters of multiple firms, types of organizations, and individuals. (Moore, 1993, Autio & Thomas, 2014). Within the field of management and innovation studies, there are now many, partially overlapping concepts, such as business, innovation, and knowledge ecosystems. (Valkokari, 2015).

The researchers claimed that the resource-based-view theory could be applied to different types of incubators or Centers. Although some previous studies criticized the theory in terms of its applicability, Nkosinathi & Robert (2014) have shown that many university-based incubators adopted the theory.

A well-founded typology of innovation ecosystems cannot be obtained from the literature review, but the term is nonetheless encountered in a number of contexts:

1. Corporate (open innovation) innovation ecosystems. (Xiaoren, Ling, and Xiangdong, 2014).
2. Digital innovation ecosystems. (Rao & Jimenez, 2011).
3. City-based innovation ecosystems and innovation districts (Cohen et al., 2014); (Morrison, 2013); (Lin, 2014).
4. High-tech SMEs-centered ecosystems.
5. Accelerators that their services and competencies syndicate to construct hyper-local innovation ecosystems.
6. University-based innovation ecosystem. (León's, 2013)(Fetters et al., 2010).

A lack of consistency was observed in the views of the different authors, however, in the same context, it is clear that innovative ecosystems can help build economic societies based on innovation.

The national system of innovation includes:

1. Government agencies and relevant bodies supporting innovation through regulation, standard-setting, public and private partnerships, and basic research funding (Patel & Buffett, 1994).
2. Universities conducting basic research and training of technical and scientific manpower (Patel & Buffett, 1994).

The national systems of innovation and entrepreneurship have evolved in parallel, independently of each other, even though the concepts of innovation and entrepreneurship themselves are closely linked, and both follow at least some intellectual aspects of Schumpeter. (Radosevic, 2007); (Schmid, 2004).

3. RESEARCH METHODOLOGY

The aim of this study is to explore the field due to the absence of previous work on university typology of innovation in the UAE. This research will be a qualitative research design. The Federal nature of the UAE provides adequate research capabilities for exploratory study. The primary research data will include the list of all UAE universities from the Commission for Academic Accreditation (CAA, 2022). Secondary sources will be used as a sampling frame. The sampling procedure involves contacting the federal, local government, and private universities or colleges and arranging interviews with them. Documentation includes reports relating to universities or colleges' size, ownership structure, program funding, specialization, facilities, and services. There were no separate pilot studies that acted as a pilot for the next one. The fieldwork lasted three months. The analysis started with a textual review of the transcript secondary data and adopted a systematic combining approach.

4. FINDINGS AND DISCUSSION

The Centre of Excellence for Applied Research and Training (CERT) at Higher Colleges of Technology (HCT) was established in 1996 to adopt entrepreneurial initiatives by developing the latest technologies and supported by international technology-related partners. According to Hamad & Arthur (2012), the first business incubator was launched in 2002 through Mohammed Bin Rashid's Establishment for SMEs Development (which has been changed to become Hamdan Innovation Incubator). The UAEU Science and Innovation Park (UAEU-SIP) and Start AD, NYU Abu Dhabi were both established in 2016 as the first concepts of innovation and incubator centers in the UAE universities. (A.

Al Ameeri, 2019). Now there are sixteen universities and Colleges in the UAE that have Innovation and Entrepreneurship Centers (see Table 1).

Table 1: List of UAE Universities and Colleges have Innovation and Entrepreneurship Centers

No	Universities and Colleges
1	ABU DHABI UNIVERSITY
2	AJMAN UNIVERSITY
3	AL AIN UNIVERSITY
4	AMERICAN UNIVERSITY IN DUBAI
5	AMERICAN UNIVERSITY IN THE EMIRATES
6	AMERICAN UNIVERSITY OF RAS AL KHAIMAH
7	AMERICAN UNIVERSITY OF SHARJAH
8	DUBAI INSTITUTE OF DESIGN AND INNOVATION
9	HAMDAN BIN MOHAMMED SMART UNIVERSITY
10	HIGHER COLLEGES OF TECHNOLOGY
11	KHALIFA UNIVERSITY
12	NEW YORK UNIVERSITY, ABU DHABI
131	ROCHESTER INSTITUTE OF TECHNOLOGY- DUBAI
14	UNITED ARAB EMIRATES UNIVERSITY
15	UNIVERSITY OF DUBAI
16	UNIVERSITY OF SHARJAH

In October 2019, Dubai Future Foundation (DFF) signed agreements with Zayed University, Higher Colleges of Technology, University of Dubai, Hamdan Bin Mohammed Smart University, American University in Dubai, and the College of Fashion and Design in Dubai. to transform universities into economic and creative free zones that encourage innovation and entrepreneurship among students and to integrate entrepreneurship and innovation into the curricula of higher education institutions in the UAE. The UAE Government and Local government are the biggest supporters of universities and colleges, and with limited support from the private sector.

The university incubators or Innovation Centers which are more located in Engineering schools have been provided with the latest and most up-to-date IT and support services to incubated entrepreneurs such as smart infrastructure, ICT equipment, networking events, and mentorships. Due to the early stage of those incubators and centers, it is still early to determine the outcome. However, with a skilled workforce with an entrepreneurial mindset, the outcomes of incubated startups are expected to emerge after some time.

The overall findings showed that R&D funds at federal universities such as UAEU, Zayed University, and HCT, and some local government universities such as Khalifa University and Sharjah University, are moderately available in the UAE. Also, the results showed that the activities of their incubators are not integrated with the research projects at those universities. However, very few related research cases have been incubated via the Innovation Centres. Also, although the government has allocated a sufficient amount of funds to the R&D programs in select universities, those amounts have not been directed to address industry problems (the gap between the market and universities).

One a good example of UAE government cooperation with universities is MeznSat first student-built scientific satellite in the UAE The project is a collaboration between the UAE Space Agency, American University of Ras Al Khaimah (AURAK), and Khalifa University of Science and Technology (KUST), The project aims at providing the UAE space industry with qualified well-trained graduates through hands-on experience, while at the same time opening windows for advanced space-oriented research relevant to the UAE. MeznSat which will be used to collect and analyze data on carbon dioxide and methane levels around the UAE (AURAK, 2020).

5. CONCLUSİONS

This study focused only on universities located in the UAE which it's an emerging country. As introduced above more research is required on University-based innovation ecosystems' reach and strategic context. This study is focused on university incubators or Innovation Centers only. Researching these further requires more detailed historical data about how the competitive landscape looked at the time of these University-based innovation ecosystems'. The pursuit of the aforementioned areas of further research will undoubtedly improve the validity and generalizability of the findings of our study.

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