THE ROLE OF EGYPTIAN HIGHER EDUCATION IN THE DEVELOPMENT OF DIGITAL ENTREPRENEURSHIP: EVIDENCE FROM PRIVATE UNIVERSITIES

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DOAA SALMAN ABDOU2

Abstract

Digitalization is reshaping the country's future economic viability. Many countries invest in developing digital entrepreneurs to accelerate economic growth.

This study aims first to determine the role of Egyptian private higher education (HE) in developing digital entrepreneurs (DE). Second, explore the institutional governance and strategy of the private universities via the three higher educational constructs, namely the university vision, mission, and core value; the educational environment; and the university's digital social media use as an influencer factor in the development of digital entrepreneurs.

The methodology of the paper applies both qualitative and quantitative methodologies. It began with a series of semi-structured interview questions posed to a group of undergraduate students, followed by a quantitative investigation. This research highlights the existing difficulties and prospects of DE in Egyptian higher education. Finally, provide recommendations to decision-makers and educators on how to speed up DE.

Keywords: Digital education, higher education, entrepreneurship, education

JEL Codes: C13, O47

Introduction

The concept of digital entrepreneurship has been in the research for a few decades, an intense focus was given to the correlation between higher education and DE. Entrepreneurship becoming one of the most important economic drivers known in the modern economy as a catalyst in economic growth, fighting poverty, and the potential for business sustainability. From the main drives in the support of energy economies. DE as a sub-category of entrepreneurship comes with endless possibilities and opportunities for creating products and services.

Egypt's young and ambitious government has established strategic intentions in terms of government digitalization as part of its efforts to better integrate into globalisation. The health sector, financial sector, government affairs sector, industrial sector, and education sector have all shown signs of alignment. Universities, on the one hand, have converted to an online mode in an instant once the pandemic was announced, employing what was already installed and enabled in technology to accommodate students in various disciplines of study. During the crisis, the HE sector made a remarkable transformation, propelling HE ambitions to the next

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level of technology enablement and support. An online survey was issued to undergraduate students in private Egyptian universities to serve the purpose of this article. The sample size was 250 students during the period from January till March 2021. By bridging the gap between diverse entrepreneurship education programmes in business schools and digital entrepreneurs, this study adds to the body of knowledge (DE). The findings provide insight into the current situation as well as the urge to use digital technology in entrepreneurship education programmes to help the country flourish.

This paper has for objective to study the Egyptian DE readiness and impact through the experience of its current undergraduate students. While DE is a multi-dimension study we shall only focus in this paper on three organizational constructs. Literature support that for universities to enable DE it must originally be embedded it is governance and leadership. By which we mean strategic plan and intent. For that purpose we try to assess the Egyptian HE for enabling DE in Egypt by analyzing from students' perceptions the impact of i) the university vision, mission, and core values; ii) the university environment and iii) the university's digital social media performance. The goal of the article is to understand the current capabilities of HE in comparison to this worldwide opportunity, given the importance of DE in the future of the country's economy. Most importantly, make recommendations to the higher education industry as a practical roadmap for future DE generations. The following is how the paper is constructed for that purpose: it starts with a literature review on understanding what is entrepreneurship and its collaboration with education; followed by a larger focus on the DE concept and its needs in HE; next, the role of DE in economic activities is highlighted; followed by a section explaining the roles of the Egyptian government to accelerate DE in HE; finally, the findings are discussed.

**Literature review**

The HE sector is recognised in the literature as the catalyst of change and society development. The most impact cultural impact factor and with a responsibility to search and answer for social problems and solutions. It is accordingly expected from HE to support the undergraduate by enabling them to match the needs of future opportunities. Hence, if DE is the future of economic growth and stability in the global environment, it is expected that HE, all around the world, Egypt not an exception, needs to prepare the future grades with the hard and soft skills necessary to integrate DE.

**From entrepreneurship to digital entrepreneurship in higher education**

The persistent global economic situation has dramatically shaped the global business creating new trends in terms of global competition, social and customer powers, corporate rightsizing, and reengineering all of which became both push and pull reasons for entrepreneurship as a concept. Entrepreneurship then became one of the most promising economic drivers to answers to many of the global economic challenges and problems particularly in the emerging countries (Christensen, Hang, Chai, & Subramanian, 2010; Kimmitt, Hardman, Stricker, & Ketterson, 2019; Soluk, Kammerlander, & Darwin, 2021) but as well as in the developing countries (Postigo & Tamborini, 2004; Sutter et al., 2019; Si, Ahlstrom, Wei, & Cullen, 2019).

Consequently, increased interest from both policymakers as well as educational institutions has been invested in entrepreneurship (Gorman, Hanlon, & King, 1997; Jeyalakshmi, & Meenakumari, 2015). There are hundreds of definitions of the concept, we refer to the work by Rao and Sri (2019) in which he offers not only a number of the most referred to definitions in literature but he also presents them in a timeline of the concept's evolution which we summarise and represent in Table 1 below:
<table>
<thead>
<tr>
<th>Year</th>
<th>Author</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>Jones &amp; English</td>
<td>• It is the process of giving individuals the prospect that enables them to identify profitable opportunistic ventures and the needed application of knowledge, skills, and attitudes to initiate action to enter into the venture</td>
</tr>
<tr>
<td>1990</td>
<td>Chandler</td>
<td>• It is observed that entrepreneurship is dealing with uncertainty, making a distinction between risk, which can be calculated and uncertainties that cannot be overcome</td>
</tr>
<tr>
<td>1985</td>
<td>Peter Drucker</td>
<td>• It is a systematic innovation that consists of a purposeful and organizational search for changes, and a systematic analysis of the opportunities such changes might offer for economic development and social innovation. An entrepreneur is a person who is willing to risk his capital and other resources in a new business venture. From which he expects substantial rewards if not immediately, then in the foreseeable future.</td>
</tr>
<tr>
<td>1934</td>
<td>Schumpeter</td>
<td>• It is the bearer of the mechanism for change and economic development, and entrepreneurship is the undertaking of new ideas and a new mix that is innovations</td>
</tr>
</tbody>
</table>

**Source:** Rao and Sri (2019)

Despite the timeline of 1934 to 2004, all attempts to define entrepreneurship have common keywords and notions embedded, among which we can highlight: its positive correlation with the economic outcome; another positive correlation with the concept of innovation; it is central to risk management; it is fundamentally based on entrepreneurship knowledge, skills, and learning. Because the concept is always changing, it is also worth noting a more recent definition. It is more associated with the new business environment characteristics, although it is fundamentally the same.

Entrepreneurship is defined as a transversal key competence applicable by individuals and groups, including existing organisations, across all spheres alike: "Entrepreneurship is when you act on opportunities and ideas and transform them into value for others," according to Gibb and Haskin, 2018.

The value that is created can be financial, cultural, or social” Two key aspects of the definition proposed are that entrepreneurship applies both to individuals and organisations and that it concerns the innovative, forward-looking and value-creating utilization of resources.” We can add to the analysis of this definition also the novelty of understanding entrepreneurship relations to society and culture not only to economy and finance. While the concept has established very clearly its importance for the future of economies, a major literature debate is still unsettled arguing if entrepreneurship is born or acquired? Several others argue that entrepreneurship is born (Morris, Kuratko, & Schindehutte, 2001); while others insist that with the right education, training and professional experience entrepreneurship can be acquired (Drucker, 1985; Gorman, Hanlon, & King, 1997; Cheng, Chan, & Mahmood, 2009; Othman & Nasrudin, 2016). In support of the above debate, this study refers to the work by Lackéus & Middleton, (2015). which offers a consolidated presentation of the reasons for the relevance and importance of entrepreneurship education. Which infer that knowledge and learning are not only the foundation for creating entrepreneurs but most importantly developing a supportive society and organizational culture that can host entrepreneurship. Hence education is at the heart of establishing the concept of entrepreneurship as well as the developmental tool in the formation of entrepreneurs.
Does literature show what is expected from education to be the catalyst it is expected to be in support of entrepreneurship? In a try to answer this question we refer to the work by Rao, 2019, he consolidated the education “activities aiming to foster entrepreneurship mindset, attitude and skills” to enable “idea generation, start-up, growth and innovation” which we summarize in a table (2) below:

Table 2. Education and entrepreneurship relationship

<table>
<thead>
<tr>
<th>Activity</th>
<th>Objective</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Provide meaningful graduate education methodology</td>
<td>To make youth self-reliant and subsequently encourage them to be independent and confident with the concept of self-employment</td>
</tr>
<tr>
<td>2 Provide graduates with training and support</td>
<td>To help them establish a career in small and medium-sized businesses, through professional training or ideas incubators</td>
</tr>
<tr>
<td>3 Provide graduates with soft skills</td>
<td>To ensure that the graduates possess the human behaviour needed to support entrepreneurship</td>
</tr>
<tr>
<td>4 Provide graduates with risk management education</td>
<td>To make uncertainty management possible and relatively easy</td>
</tr>
</tbody>
</table>

Source: Prasanthi and Bhaskara (2019)

Education can provide graduates with the necessary knowledge in business, management, strategic management, project management, risk management, and other business disciplines; it can improve human behaviour by teaching methodology and soft skills such as teamwork, communication, leadership, problem-solving, and critical thinking; and it can improve performance by providing the appropriate training and professional exposure. All of this supports the notion that entrepreneurship is a form of education and learning.

The concept of entrepreneurship continued to expand as digital technology became more prevalent. Without a doubt, significant technology startups have dominated the corporate spotlight in recent decades. Hundreds of billions of dollars have been successfully spent on entrepreneurship digital inventions such as Facebook, Google, and Amazon, to name a few. As a result, academic research has discovered a growing interest in DE research. While entrepreneurship was already an interdisciplinary field of study, DE brought in new disciplines such as information systems (Du, Pan, Zhou & Ouyang, 2018); ii) innovation (Nambisan, Siegel, & Kenney, 2018); iii) policy (Nambisan, Wright, & Feldman, 2019); and iv) strategy (Autio, Nambisan, Thomas, & Wright, 2018; Sahut, Iandoli, & Teulon, 2021)

In the digital era, it makes use of digital technologies to create and conduct business” (Rippa, & Secundo, 2019). This implies that digital entrepreneurship education is a subclass of entrepreneurship education that makes use of digital technologies while imparting entrepreneurship knowledge and skills.

It is urgent to enable graduates with both hard and soft skills. Hard skills as defined by Shakir (2009): are “as related to technical and practical skills that can be observed, quantified and measured”. And soft skills as defined as: “the behavioural skills needed in the organisation to apply hard skills and knowledge”. Higher education is responsible for the development of soft skills and equipping students with an array of behavioural tools, (Humsona & Yuliani, 2018; Hytti & O’Gorman 2004; Toding & Venesaar, 2018). The most significant hurdles for entrepreneurship education are the barriers to realising the full potential of developing digital and smart technologies, beginning with a fundamental understanding of their potential significance. In this context, digital and smart technologies have garnered more attention in
recent years in business and management practice, to provide products or services that are more competitive, sustainable, and provide optimal value to the parties involved (Salman, 2022).

The concept of digital technologies is a result of three distinct but related elements: digital artefacts, digital infrastructure, and digital platforms. A digital artefact can be defined as a digital component, application, or media content that is part of a new product (or service) and offers a specific functionality or value to the end-user. Digital infrastructure is defined as digital technology tools and systems that offer communication, collaboration, and or computing capabilities (Nambisan, 2017). Infrastructure can be defined in general as the basic physical and organizational structures needed for the operation of a society or organization. Digital infrastructure such as cloud computing, data analytics, online communities, social media, 3D printing, and digital maker spaces can support the business process and the supply chain activities of companies. For example, 3D printing, also known as “additive manufacturing” or “rapid prototyping”, is the printing of solid, physical 3D objects. Drawing on computer-aided design (CAD) files, 3D printing makes it possible to build physical models, prototypes, patterns, tooling components, or production parts. Digital technologies as composed of digital artefacts, digital infrastructure, and digital platforms could represent the basis of the digital transformation of entrepreneurial learning processes within universities and higher education institutions.

Further challenges more specific to DE entrepreneurship in general in HE can be summarised by creating research measurements to assess the effectiveness of entrepreneurship, the content and practices of entrepreneurship education, the quality of entrepreneurship instructors, accepting entrepreneurship education in university, creating a general corpus of knowledge, effectiveness in teaching methods and the learning needs of entrepreneurs who are working in line with the life cycle of a business that is currently underway, (Jami & Gökdeniz, 2020). Recent studies show that the reason why female participation in entrepreneurship is limited can be explained by the fact that education still needs to be linked to work prospects, (Salman, Rashdan & Amr, 2020).

Universities are supposed to generate graduates who possess the necessary skills and knowledge to find work. They are also required to be highly specific in delivering the education and methods that would allow future generations to sustainably stimulate economic growth. Education is at the heart of DE principles, according to the preceding literature. We may conclude from the literature review that higher education has an important role in entrepreneurship and, as a result, DE. For institutions to support and teach DE, they must be not only technologically advanced but also strategically aligned with the Digitalisation concept. Again, we don’t just mean automation; we mean universities embracing Digitalisation as a basic component of their constitutions. Its strategic plan is integrated by its governance and leadership. Beyond these compositions, there is, of course, the need to develop a roadmap to address the aforementioned issues, which include material, teachers, technique, and integration into a real-world philosophy.

Researchers emphasise the importance of Research & Development, a well-educated workforce, and solid economic policies are all significant factors in recruiting new business and boosting economic growth (Salman, 2016). In this regard, decision-makers must enhance and raise the funding allocated to research and development to accelerate technological progress. As well, financial assistance funds and subsidies are the pillars to assist businesses.

**Role of DE in economic activities**

Information communication technology (ICT) is commonly employed to include landline telephones (smartphones, websites, artificial intelligence) computer technology, radio, television, and evolving digital technologies. The particular challenges and reliance on ICTs
are important (Hull, Hung, Hair, Perotti, & DeMartino, 2007; Onetti, Zucchella, Jones, & McDougall-Covin, 2012). New digital enterprise prospects in terms of mode of entry, a system of development payment/into meme seizure, and stakeholder relations management (Beckman & Essig, 2012). While the number of small digital enterprises in developing countries increases relative to advanced economies, "until now academic research has skimmed the surface of how" it is being developed and run. Based on resource scarcity constraints, African countries are an emerging market for small, digital enterprises. With one of the world's fastest rates of internet usage, there are chances for digital businesses all around Africa (Gathege & Moraa, 2013; World Bank, 2014).

Apart from the information gap, the focus is on digital business, which is technically crucial in the creation of new contractors' businesses. "The techniques used to develop entrepreneurs are frequently influenced by elements such as the industry sector, competence, institutional characteristics of the national economy, and the viewpoints and knowledge of the entrepreneurs" (Beckman & Essig, 2012; Ghobakhloo & Tang, 2013). This shows that to be a great digital entrepreneur, you’ll need more than just business abilities.

The link between digital enterprise and entrepreneurial digital abilities (EDS) is a mix of the entrepreneurial capabilities inherent in a digital entrepreneurial option and the strategic decision after entry (Bachev & Manolov, 2007; Marvel, 2013) as well as ICT skills (Ashurst, Cragg, & Herring, 2012). These qualities include awareness and interpersonal skills, which are linked to entrepreneur techniques and business practices (Bianchi, Glavas, & Mathews, 2017; Mitchelmore & Rowley, 2013).

If we focus on Africa for its particular context, the resource-scarce realities of Africa's economy, the impact of entrepreneurial choices and strategic decisions on the growth and operation of digital firms as a contextual effect on entrepreneurial behaviour may be proved. EDS is a combination of entrepreneurial and ICT abilities that are inherent in a digital entrepreneurial choice, as well as the strategic decision made after the entry into the market (Marvel, 2013; Ashurst et al., 2012). These characteristics include awareness and interpersonal skills, both of which are tied to entrepreneur techniques and practices (Bianchi et al., 2017; Mitchelmore & Rowley, 2013). The context of Africa's economy is one of a scarcity of resources, as indicated by the outcomes of entrepreneurial and strategic efforts. The impact of entrepreneurial choices and strategic decisions (Autio, Kenney, Mustar, Siegel, & Wright, 2014) on the growth and operation of digital enterprises as a contextual effect on entrepreneurial behaviour may be demonstrated in the resource-scarce reality of Africa's economy.

The role of the Egyptian Government role to accelerating DE in HE

The new Digital era that the world is approaching is holding many keys for development and sustainability that could create new fields, jobs, and chances for the business world and markets in Egypt. Moreover, Digitalisation also was one of the factors that helped the business and economic world in Egypt to nourish and blossom as the use of technology and later the ICTs has created many new opportunities in analyzing the 17 sustainable development goals with their sub-goals and requirements it is been found that financial inclusion is necessary for achieving at least seven of the seventeen goals. Due to the importance of financial inclusion and how financial literacy help give females a better chance of entrepreneurship and employability this indicator has been essential for the study and as the governments have been pushing for financial literacy.

Many graduate students engaged in entrepreneurial activities in Egypt lack the knowledge and skills required to establish a business because they have not obtained any formal entrepreneurship education (Sheta, 2012). Starting a business may be beyond the scope of some people's life experiences. They may reside in an area where there are few entrepreneurs.
or where entrepreneurship has low visibility. They may, on the other hand, have family or friends who have established their firm, or they may live in an environment where entrepreneurship is high-profile and receives a lot of positive press.

According to Hill et al. (2022), the proportion of adults running an established firm fell from 2019 to 2020, then rose in 2021; for six economies, the opposite was true (dropping in 2020, rising in 2021). There were ten economies in which EBO was higher in 2021 than it was in 2019, however, most of the differences were minor (only Egypt, Qatar, and the Republic of Korea saw increases of more than 1% of adults in their economy). Between 2019 and 2021, the proportion of adults who own a business declined in the majority of economies. Zaazou & Abdou (2021) show that the covid-19 pushes many entrepreneurs to boost their business using a digital platform to survive. Moreover, the availability of technology, the bulk of micro and small businesses in low-income countries rely on global supply networks, which has affected many small-scale enterprises, particularly after the devaluation. Furthermore, innovation is used by just a small number of businesses (Salman, 2022). This involves the development of new intellectual property systems, as well as national intellectual property rules and processes, to make the creation and protection of intellectual property easier at the national level. Fostering these activities increases a country's ability to produce economically valuable real estate assets.

**Methodology**

The researchers considered conducting an exploratory study via an online survey with both closed and open-ended questions. Following that, a quantitative study to provide new insights and explanations to previously overlooked ideas through conceptual tools that allow a researcher to ask specific questions to study the chosen sample through active involvement, which allows a researcher to put themselves in another's shoes and see things from their perspective (Reiter, 2017).

The fieldwork focused on a group of undergraduate students from Egypt's private higher education sector. A total of 250 students took part in the survey. The literature provides us with a collection of questions that reflect the impact of HE on DE in Egypt, with a particular focus on the factors we have chosen.

The study's goal is to highlight the need for training undergraduate students to prepare them for careers as DEs. As a first stage, the questionnaire focuses on "universities vision, goal, core values," "education environment," and "digital social media." The questionnaire is divided into two parts, the first of which was assessed using Guttman-scaled items. To further the study's goal, questions aim to provide respondents who agree with the supplied statement a "Yes" if it was satisfactory toward DE, and a "No" if it was not. It's a method for determining how a statement relates to the construct of interest. The three educational constructs were: first, university institutional vision, mission, and core values; second education environment; and third digital social media.

This research paper is attempting to assess the role of the HE private sector in developing DE in Egypt, the timeline is during the Covid19 pandemic. The research questions are: Does Egypt's present HE private sector support DE? And Is Egypt's existing HE private sector facilitating DE?
**Figure 1.** Conceptual Framework for the relationship between HE and DE

Source: Constructed by authors

The digital entrepreneurs’ role is accelerated via the digital tools which are based on the university, the education environment and the digital social media.

**Table 3.** Description of the three educational constructs

<table>
<thead>
<tr>
<th>The Terms</th>
<th>Descriptive Definitions</th>
</tr>
</thead>
<tbody>
<tr>
<td>University vision, mission, core values</td>
<td>Express the stimulus to boost the university’s capacity and future. This composes the knowledge triangle of education, research, and business to form the DE environment.</td>
</tr>
<tr>
<td>The education environment</td>
<td>Display the innovative practices and learnings to increase awareness and understanding of the DE activities and achievements via active engagement with external stakeholders.</td>
</tr>
<tr>
<td>Digital social media</td>
<td>Show the different digital content (text, graphics, pictures, audio, videos) that can be transmitted over the internet or computer networks.</td>
</tr>
</tbody>
</table>


**Table 4. Section-1 survey items**

<table>
<thead>
<tr>
<th>University vision, mission, core values</th>
<th>1- I believe that my university has a vision for setting the direction to promote digital entrepreneurship in Egypt.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2- I believe that my university has a mission for creative thought, to enable digital entrepreneurship to thrive in Egypt.</td>
</tr>
<tr>
<td></td>
<td>3- I believe that my university has core values to help students live up to their potential as successful digital entrepreneurs in Egypt.</td>
</tr>
<tr>
<td>Education environment</td>
<td>4- My University prepares me for my digital career through active engagement with external stakeholders</td>
</tr>
</tbody>
</table>

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5- My university provides me with the internet and mobile broadband as utilities to develop the digital entrepreneurial environment.
6- My University is opening new opportunities for digital start-ups.

Digital social media
7- During studies I learned that internet-based social media is the key to digital entrepreneurship.
8- I have learned that digitized content requires digital literacy across multiple mobile devices.
9- I have learned that making connections across geographical borders may lead to maximizing digital opportunities.

Role of educators to foster DE
10- Why is it important to foster digital entrepreneur DE in the context of higher education for moving towards “Boost Egypt's economy”? How?


Analysis and Quantification of the Measurement Model
The results reported in the following sections present respondents’ reactions based on the questionnaire.

Descriptive study
The results show that the responses from the sample represent 45% female and 55%, male. The sample included the following universities: Arab Academy for Science Technology & Maritime Transport (AASTMT), American University in Cairo (AUC), Future University (FUE), German University in Cairo (GUC), October University for Modern Sciences and Arts (MSA), and New GIZA. The survey was distributed to six students of Egyptian private universities, and the percentage of universities in the sample was as follows. Each of the six universities accounted for between 10% and 20% of the total sample size, (See Figure 2).

Figure 2. Represent the participant’s student in the survey

Source: researcher calculation

Section-1 (Q1, Q2, Q3): The institutional vision, mission, core values

Of the 150 responses to this section, 74% indicated that they do not believe their institution has a vision in setting the direction to promote digital entrepreneurship in Egypt (Q1), and 69% indicated that they do not believe their institution has a mission for creative
thought, to enable digital entrepreneurship to thrive in Egypt (Q2), and 66% indicated that they do not believe their institution has core values to help students live up to their potential for successful digital entrepreneurs in Egypt (Q3). The result is shown in the following Figure 3.

**Figure 3.** The findings for survey items Q1, Q2, Q3

Irrespective of the digital opportunities needed by the graduate students, if the institution does not possess a specific concentration on and promotion of DE in the context of undergraduate Programs, then the digital opportunities gap of the graduate students will not be bridged.

**Section-1 (Q4, Q5, Q6): Academic environment**

As was the case with the results of the “institutional vision, mission, core values”, and indeed perhaps a consequence, “the academic environment” does not prepare the respondents for their digital career through active engagement with external stakeholders (61%), do not provide the respondents with the internet and mobile broadband as utilities to develop the digital entrepreneurial environment (63%), and is not opening new opportunities to digital start-ups (49%). The result are shown in the following Figure 4.

**Figure 4.** The findings for survey items Q4, Q5, Q6

In addition to this, digital connectivity, digital literacy, innovation, and knowledge hubs are critical to sharing knowledge and may provide support for maximizing digital opportunities.

**Section-1 (Q7, Q8, Q9): Digital media**

“Digital media” is receiving strong positive attention from the respondents. Of the 150 responses to this section, the majority of respondents confirmed that they have learned that internet-based social media is the key to digital entrepreneurship (87%), that digitized content requires digital literacy across multiple mobile devices (85%), and making connections across
geographical borders may lead to maximizing digital opportunities 82%). The result are shown in the following Figure 5.

**Figure 5.** The findings for survey items Q7, Q8, Q9

![Bar charts for Q7, Q8, Q9](image)

Source: researcher calculation

The findings reveal that incorporating the “digital media” into learning created awareness and prepared the respondents for the digital opportunities where connections across geographical are in place. The level of strong positive reactions brings a more practical insight into the reality that the majority of the graduate students are as digitalized as might be assumed for the “millennial generation”.

Equally important is to encourage Egyptian universities to make DE a key priority for the education agenda, by providing “digital media” training with other stakeholders on the campus to launch specific initiatives to develop effective programs and processes for EE, such as forums and events, DE centres, curriculum development, global exchange networks, competitions and awards that focus on “digital media”.

**Section-2 (Q10, Q11, Q12):**

DE in the context of HEIs for moving towards “Making Egypt digitalis”

The respondents were asked to rank these areas in order of significance to interpret the results of the three educational constructs in this study. The most crucial factor is “digital media.” This finding demonstrates that the advantages of employing digital technology are important to undergraduate students. This indicates that all respondents believe “digital media” is the most appealing idea for gaining faster and greater access to maximising digital chances in the expanding trend of digital technology. This result serves to raise awareness of “digital media’s” digital needs, which may lead to the DE ecosystem's business community, public sector, and other players supporting the development of course materials (books, cases, online games, video, etc.) not only for EE but also for personal development as a future digital entrepreneur.

“Academic atmosphere” has the second-highest ranking, which is not surprising. This outcome can be interpreted in terms of the EE system in Egyptian undergraduate programmes, which may cover all faculties and disciplines to promote the application of “learning by doing” through project-based learning, internships, and consulting with external stakeholders. This finding demonstrates the importance of graduate students' viewpoints in building a clear framework of intended DE results through the development of individual abilities, attitudes, and mindsets. The “academic environment” is less appealing than "digital media," as evidenced by this outcome.

Although the “institutional vision, mission, and core values” are intended to be the most important organisational building blocks, the creative force shaping long-term strategic plans and agendas, and the catalyst of academic environment choices when undertaking entrepreneurial initiatives to improve the state of Egyptian universities, the findings reveal that
this educational construct is ranked last. This condition indicates that future research should dig deeper into this finding, utilising this study's early investigation as a starting point to figure out what happened to the “institutional vision, mission, and core values.”

The responses to survey items Q1, Q2, and Q3, as shown in Figure 4, provide some clues. This high percentage score suggests that respondents require more clarity, which should be based on a broad set of outcomes rather than limited measurements such as the replication of initiatives that are ineffective and waste time and money with little to no impact. This also implies that top-management and departmental leaders' internal support and dedication demonstrate how a clear strategic focus on DE – integrating research, teaching, and practical activities – allows for the development of a specialised infrastructure for DE over time.

Having discussed the interpretation of the ranks to those three educational constructs, the author moves to review the personal comments regarding the respondents’ views of DE associated with EE (Q10, Q11, and Q12). Table 6 presents the quotes which illustrate some thoughts of the respondents.

Table 6. The results of Q10, Q11, and Q12

<table>
<thead>
<tr>
<th>Survey items</th>
<th>The narratives provided by respondents</th>
</tr>
</thead>
</table>
| Q10 - What makes a successful DE at the HEIs in Egypt? | • To create a dynamic and competitive digital business environment, affordable, dependable, high-speed broadband infrastructure is needed.  
• More cross-industry collaboration between universities, governments, and corporations.  
• Locally, regionally, and globally, innovation agendas serve as a springboard for success.  
• Student-based digital businesses can apply for R&D grants and incentives.  
• A crowdfunding platform that will make it easier for students to raise funds and expand their digital businesses.  
• Student-run digital businesses are protected.  
• A level of technological awareness that enables students to know new technologies that will transform and shape the digital business model, allowing them to try new things or do things differently, as well as develop new products and services, delivery methods, and ways of communicating with suppliers, customers, and employees. |
| Q11 - Why is it important to foster DE in the context of HEIs for moving towards “Making Egypt digitalis”? | • Because DE provides more options for graduate students, but because I am unfamiliar with this form of education,  
• Because DE prepares students in higher education for a future career in the digital realm.  
• Assisting students in higher education with their studies.  
• Students at the tertiary level should take heart from encouraging developments in the establishment of a dedicated DE programme across Egypt's higher education institutions.  
• I'll have a variety of interactions with various government bodies, and this can help start-ups with digital businesses reduce the administrative burden that comes with complex bureaucracy.  
• Students at the higher level of education will contact a wide range of participants in their local ecosystem, as well as with people from other countries. |
| Q12 - Do you have any opinions or suggestions to add? | • In my point of view, “digitalis” needs to be investing in and growing the students’ start-ups pool from seed stage investment through developing affordable solutions that allow businesses to capture every sale as soon as they go live online.  
• I think, what is important is how the HEIs promote “digitalis” to the world to show how strong an ecosystem the HEIs have and how good the digital opportunities are to start a digital business here in Egypt.  
• For me, DE may level the playing field in certain sectors, creating digital opportunities to work from remote areas, at different hours, from the home or on the go. |
As the cloud and big data continue to gain importance, having access to the skills of digital entrepreneurs will become ever more important.

HEIs, government and business leaders throughout Egypt should make DE a priority to encourage and support the students-based digital business to make full use of the latest digital technologies and realize the associated economic benefits.

DE associated with EE at HEIs in Egypt should be a long-term commitment, not one that starts and then stops a few years later.

I believe the best way to learn DE is from successful digital entrepreneurs who have done something like what you dream of doing.

**Source:** authors’ survey results

In summary, the results of this section raise debate if and how the current level and adoption of digital technologies in HE at the undergraduate programs in Egyptian universities prepares graduate students to adapt, take on new roles, and maximise digital opportunities in an increasingly digitalized marketplace?

**Conclusions and contributions**

We are suggesting here two angles for our conclusion, direct results conclusion as well as indirect observation conclusion.

On one hand, with regards to the original question, as it is presented in the results HE is Egypt in terms of the factors that were explored are still underdeveloped and not up to the expectation levels of the students, accordingly they are not delivering the impact factor needed from the HE for Egypt DE ambitious.

On the other hand, from indirect observation, as research, we have noticed a sense of maturity among the undergraduates participating in the survey. In terms of entrepreneurship concept understanding, importance, and transferability. This supports, that while the direct factors under study in this paper are not delivering yet the required impact factor, other education-related factors created this maturity among the students. This requires further research and investigation.

From the experience that we have gained both from the literature review and the fieldwork conducted with the particularity of the Egyptian private HE sector and in light of the government's overall interest in digitalisation and entrepreneurship as a larger context and a future getting ready for these generations here are the recommendations that we would like to offer to HE sector in Egypt to enhance on the DE contributions:

1. Work on overcoming the above-listed challenges from developing and offering the appropriate courses with the right methodology, finding and training instructors with the needs of entrepreneurship methodology in teaching and evaluation, creating entrepreneurship centres or incubators inside the universities for students to experiment, support in initial funding (direct from the university or indirect from government funds) to encourage and push ideas beyond the paper framework;

2. All educational levels, from primary students to PhD candidates, the methodologies that rely on enhancing autonomy and students' independence;

3. Reconsider the evaluation system in a way that reinforces and rewards creativity and innovation Enable a centre that creates a direct link between students and entrepreneurs as an open channel for training, consulting, observation, project evaluation, real-life experience, and exposure;

4. Further simulate research in entrepreneurship, particularly in the master's and doctoral degree;
5. Building partnerships with entrepreneurship support bodies: GNO, governmental or private;

6. Opening a direct reporting relationship with the government and policy-makers to provide them with policy and decision-makers results and ways of improvement.

To conclude, a lot is expected from universities. From leadership and governance that supports DE to enabling organizational capacity in terms of funding, people and incentive, preparing and supporting your young entrepreneurs, integrating digital transformation in the life of the university (student, system, administration, and staff), knowledge enhancing with your collaboration international bodies partnering most important consistently measuring impact and enhance strategy as they go. All these are the large ambitious implication for institutional change on a nationwide level.

Research Limitation and Future Research

The above research has only explored the institutional factors (as mentioned above) which exclude a lot of other factors and dimensions, such as the elements listed in the DE challenges above in table (5), all these need to be explored and assessed as an integrated part of the Egypt overall strategy towards DE. The size of the sample if larger will also create further results sustainability. Similar research is needed in the public universities sector, it is the most important in Egypt of students enrollment number making their results of extreme value for the governmental plans. We are focusing on entrepreneurship education in HE, while we can also start the entrepreneurship education integration at a much younger age at the school level. Most importantly, regardless of the results, is to be able to study young graduates that are entrepreneurs, the study of their journey can only improve our recommendation on both education and policy levels for better results. All these venues and limitations are an opportunity for further and future research.

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References


Christensen, C. M., Hang, C., Chai, K., & Subramanian, A. M. (2010). Editorial managing innovation in emerging economies: an introduction to the special issue. *IEEE Transactions on Engineering Management, 57*(1), 4-8. [https://doi.org/10.1109/TEM.2009.2036601](https://doi.org/10.1109/TEM.2009.2036601)


https://doi.org/10.1108/JSBED-12-2011-0037

https://doi.org/10.4337/9781783473762

https://doi.org/10.1177/0266242697153004


https://doi.org/10.1504/IJNVO.2007.015166

https://doi.org/10.1088/1757-899X/306/1/012107

https://doi.org/10.1108/00400910410518188

https://doi.org/10.24917/20833296.161.7


https://doi.org/10.1111/1365-2435.13386


young men. *PLoS One*, 14(3), e0213681. [https://doi.org/10.1371/journal.pone.0213681](https://doi.org/10.1371/journal.pone.0213681)


