

Integrating Digital Skills into Higher Education Curricula: A Syrian Public Universities' Analysis

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Abstract. Integrating digital skills into higher education institutions' curricula is critical for 21st-century students and beneficial for educational institutions. This study investigates the status quo of digital skills at Syrian public universities and surveys the most important skills and modules from the point of view of business and engineering students. We find that Syrian public higher education institutions are in immense need of integrating digital skills into their curricula. Students indicate that digital problem solving as well as programming and web development are among the most needed skills by students. They also recognized that data analysis, digital economics, and digital innovation are the most important modules for their future career. We recommend that Syrian public higher education institutions revise their curricula to accommodate students' module needs as well as offering training on the highlighted skills. This upskill requires building the capacity of academic staff at Syrian public higher education institutions on the evolving digital skills in addition to improving those institutions' digital infrastructure.

Keywords: Digital skills, university curricula, public higher education institutions, Syrian Arab Republic

1. Introduction

The past decade has witnessed a worldwide proliferation of Information and Communication Technology (ICT) in many areas, especially in education. Society has faced many social, economic, and cultural changes. Young citizens must be trained to deal with the new situation. The digitization process of many areas of human activity has obliged people to implement new strategies.

The term "Digital Natives" had already been coined by Prensky (2001) to refer to a new generation of young people who had grown up in the digital era. Those students were fast to learn and knew how to use and adopt technology (Prensky, 2007). However, many scholars have refuted this, arguing that these skills are often related to socializing, and leisure only and are not necessarily transferable to academic and professional contexts (Kennedy et al., 2009; Bullen et al., 2011; Gallardo-Echenique et al., 2015).

Nowadays, in order to thrive in contemporary society, there is an agreement in many institutions and disciplines that every student should have a specific level of general digital skills (Sánchez-Caballé et al., 2020). The most comprehensive and popular framework worldwide for general digital skills is the European Union's Digital Competence Framework for Citizens (DigComp) 2.0 and its more recent update, DigComp 2.13. According to that framework, digital skills include five areas: (1) information and data literacy; (2) communication and collaboration; (3) digital content creation; (4) safety; and (5) problem solving (Carretero et al., 2017).

Digital literacy has become an indispensable condition for mental health in these times of the digital revolution (OECD, 2018). ICT can play a significant role in students' personal and professional development. In fact, there is no clear answer to the debate regarding students' level of digital skills. Although the current generation of students is categorised as digital natives, most the scholars believe that they do not acquire an adequate or a high level of digital skills (Mesaroš & Mesaroš, 2010; Purushothaman, 2011; Sánchez-Caballé et al., 2020). Alternatively, the only thing that is clear is the relationship between the non-development of digital skills and lack of training and the positive impact that training has in this area (Starčič et al., 2016).

Even before Covid-19, Syria had encountered several serious socioeconomic challenges, which were augmented as the pandemic spread. Over the past decade, Syria has recorded a very low annual growth, increased poverty, and a very high level of unemployment. According to the Syrian Central Bureau of Statistics (2021), the Syrian per capita GDP declined by 5.4 percent in 2020. Covid-19 added insult to injury as people have lost jobs & income, and businesses have been disrupted, and health expenditure increased, putting further pressure on countries' weak fiscal position. This pandemic disproportionately hurt workers and businesses as digitally skilled workers and businesses have shown more resilience.

The digital economy is not only changing how business is done today but also creating new opportunities for global growth and prosperity. If nurtured appropriately,

technological advancements and improved internet connectivity can create innovation in business models, business networking, and knowledge transfer while also facilitating access to global markets. New and evolving digital trends, such as cloud computing, mobile web services, and social media, are drastically changing the business landscape & reshaping jobs, as well as the boundaries and responsibilities of enterprises.

Although the use of digital skills in higher education has reached advanced stages in the developed countries it is still in its infancy in many developing countries, including Syria (Al-Azawei et al., 2018; Tusiime et al., 2020). Addressing such digital skills challenge is at the heart of the focus of the 17 Sustainable Development Goals (SDGs) originally conceived by the UN, with particular emphasis on the fourth goal of "Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all." The fast-growing digital technologies and the importance of fostering digitally competent students require Syrian universities to help students develop digital skills. The current research is based on this pressing need.

2. Research Background

Digital skills are the center of debates between students and academics alike. Although being born as members of a new generation, classified as digital natives, many authors claim that students do not acquire the needed digital skills and argue that they are not highly digitally competent at all (Mesaroš & Mesaroš, 2010; Littlejohn et al., 2012; Gobel Kano, 2013; Cabezas & Casillas, 2017). Their use of digital devices does not inevitably make them digitally competent. Students need to develop their information and multimedia skills because most of their skills are technical (Ozdamar-keskin et al., 2015; S'anchez-Caballe' et al., 2021). In addition, most university students are not competent users of certain software necessary for their education (Roushan et al., 2016). Despite using multimedia tools with great fluency, they do not have adequate knowledge or theories of these technologies (Ting, 2015).

Nevertheless, other few studies have reached more positive findings concerning students' digital skills. For example, Liyanagunawardena et al. (2014) have found a group of students with a high level of computer skills as they were in the final years of an ICT degree. It is logical, though, that students with the highest levels of digital skills tend to be on courses involving ICT and are, therefore competent users of digital devices (Brodahl & Hadjerrouit, 2011; Barlow-Jones & Westhuizen, 2011).

Scholars have presented various suggestions for developing digital skills, such as changing curricula and offering training on certain important digital skills. Students seem to prefer to obtain these skills in guided subjects (Hall et al., 2013) and expect universities to support them during their learning process (Hallaq, 2016). Sarc'ic' et al. (2016) have concluded that training in the digital context enhances students' career

prospectus. Many researchers are concerned with the lack of training in adopting digital technologies (Ozdamar-keskin et al., 2015; English, 2016). Students need to improve their information literacy and support resources (Hanbidge et al., 2015).

Higher education plays a critical part in students' acquisition of skills needed for professional development (Perez-Mateo et al., 2014). Students and educators have considered the significant integration of digital skills into the curriculum as positive (Starčić et al., 2016). However, digital skills have little integration in the university curricula and can be useful for developing the university as a whole (Saalman, 2011; S'anchez-Caballe' et al., 2021). Moreover, educators' efforts seem insufficient to ensure that students will develop the skills they need for their future careers (Ungerer, 2016). To this end, there is a need for training courses in higher education to ensure the development of transversal digital skills (English, 2016). On the other hand, Perez et al. (2007) and Starčić et al. (2016) argue that universities should design and adopt ICT literacy programmes to meet students' expectations and perceptions.

The research on non-digitally skilled students emphasizes that training is necessary. However, there are also a variety of ideas concerning the type of training that is suitable. Hall et al. (2013) and Hallaq (2016) have argued that students prefer to receive training and support from their universities. Therefore, integrating this training into the curricula would be a good idea (English, 2016; Starčić et al., 2016). In addition, universities should consider upskilling their alumni through Life Long Learning (LLL) sessions to boost their employability in the job market.

3. Situation Analysis

Syria has suffered from ongoing conflict for more than 11 years. Milton (2019) argues that thirty years of development have been wiped out within the first three years of the conflict. Despite the Syrian higher education sector's apparent resilience, quality and equity have largely eroded. The World Bank (2022) indicates that the Syrian fiscal expenditures declined by 83 percent between 2010 and 2021 due to revenue shortfall. Such spending cuts hurt all sectors, and the higher education sector was one of the most affected.

The Syrian higher education system consists of 8 public universities, 23 private universities, and four institutes. Public universities are Syria's primary provider of higher education, accommodating over 90% of all higher education students. The total number of enrolled students in the academic year 2019/2020 was 494406, distributed as 445689 for public universities and 48717 for private universities (Syrian Central Bureau of Statistics, 2021).

The digitalization level at Syrian higher education institutions is still in its infancy stage, except for the Syrian Virtual University, which is based on online teaching. In a recent study on the digitalization challenges to higher education institutions, Mouselli et al. (2021) identified weak technological infrastructure at Syrian universities, with 70.4% and 66.7% of students have not heard of learning

management systems and video communication platforms, respectively. In addition, Syrian students have specified that digital skills (10.50%) are among the most abilities and skills they need to improve in order to succeed in distance learning.

Given the importance of integrating digital skills in higher education, this research aims to identify what digital skills are perceived as important by students and which modules should be integrated into the curricula at Syrian public universities to upskill students with digital skills. More specifically, this research investigates the following questions:

1. What is the students' level of digital skills in Syrian Universities?
2. What are the most important digital skills students need to develop their professional level and meet market needs?
3. What are the most important types of training that students prefer to develop their digital skills?
4. What key modules and their relative importance should be integrated into the curricula?

4. Research Methodology

In order to examine the situation of digital skills at Syrian public higher education institutions from students' perspectives, a survey (structured questionnaire) was conducted on Business and Economics and Engineering students. The structured questionnaire consists of three parts. The first part of the questions was related to students' demographical characteristics such as gender, age, higher education institution name (public or private university), an education level (undergraduate or postgraduate), and faculty type. The second part of the questionnaire was linked to the available digital skills and the most needed skills to comply with market needs. The third part of the questionnaire consisted of the modules that should be integrated into the university curricula. A Likert scale measured these statements from 1 to 5, where "1" had a strongly disagreed value and "5" strongly agreed. Furthermore, students were asked to rank certain suggested modules on the basis of their most importance from 1 to 5, where "1" are least important while "5" is most important.

The sample size was 129 students. The research was conducted in Syrian public universities between January and February 2022. The questionnaire was distributed online through student representatives of Syrian higher education institutions and social media student groups (e.g., Facebook). In this research, 129 Syrian students from different public higher education institutions participated. Students' demographical characteristics demonstrated that 32.6% of females and 67.4% of males were involved in the survey. 53.5% of respondents were in the age category between 20 and 25 years old. 51.2% of students are from Aleppo University, and 72% of the survey participants studied in the undergraduate program (Table 1).

Distribution results of students by higher education institution faculty demonstrate that most students (65.1%) have studied in Engineering Faculty while 34.9% of

respondents have Business & Economics Faculty (Table 1).

Table 1. Students' demographical characteristics (created by the authors)

Characteristic	Respondents Number	Percentage (%)
<i>Gender</i>	129	100
Female	42	32.6
Male	87	67.4
<i>Age Category</i>	129	100
Less than 20	2	1.6
20-25	69	53.5
26-30	33	25.6
More than 30	25	19.4
<i>Higher Education Institution</i>	129	100
Aleppo University	66	51.2
Damascus University	30	23.3
Syrian Virtual University	24	18.6
Al-Furat University	9	7
<i>Education Level</i>	129	100
Undergraduate Education	93	72
Postgraduate Education	36	28
<i>Faculty</i>	129	100
Business & Economics	45	34.9
Engineering	84	65.1

Table 2. Distribution of Students by Perceived Level of Digital Skills (created by the authors)

Faculty	Elementary	Intermediate	Advanced	Total
Business & Economics	9 (20%)	25 (55.5%)	11 (24.5%)	45
Engineering	20 (23.8%)	48 (57.2%)	16 (19%)	84
Total	29 (22.5)	73 (56.6%)	27 (20.9%)	129

5. Research Findings

In order to investigate students' perceived level of digital skills, we asked students to indicate their level of digital skills. Surprisingly, there is no big difference between Business & Economics students and Engineering students regarding their perceived digital skills. Less than a quarter of both faculty students indicated that their digital skills are elementary. More than 50 percent of students believe that their digital skills are intermediate, while less than a quarter of students rank their digital skills as advanced.

The surveyed Syrian students have specified that the most important digital skills

essential to meet market needs were associated with digital problem solving (13.06%), programming and web development (10.42%), data analysis (10.11%), e-commerce (8.40%), and digital project management (7.31%) (Table 3). Survey results showed that digital product management (3.58%), digital finance (3.81%), and digital transformation skills (4.81%) were not critical for market needs.

Table 3. Required students' digital skills to meet evolving market needs (created by the authors)

Digital Skills	Respondents Number	Percentage (%)
Digital Problem Solving	84	13.06
Programming & Web Development	67	10.42
Data Analysis	65	10.11
E-Commerce	54	8.40
Digital Project Management	47	7.31
Digital Teaching & Learning	45	7.00
Digital Marketing	44	6.84
Business Intelligence	40	6.22
Digital Design and Data Visualization	39	6.07
Digital Communication	35	5.44
Digital Business Analysis	32	4.98
Establishing and Managing Digital Markets	32	4.98
Digital Product Management	23	3.58
Digital Finance	20	3.11
Digital Transformation	16	2.49

The surveyed Syrian students have specified that the modules they need to improve their digital skills were associated with data analysis (14.71%), digital economics (14.34%), digital innovation (12.87%), cybersecurity (11.76%), and digital marketplace management (11.40%) (Table 4). Survey results indicate that financial technology (8.46%) and digital entrepreneurship (5.51%) were not critical in improving their digital skills.

Table 4. Modules that Enhance Digital Skills (created by the authors)

Modules	Respondents Number	Percentage(%)
Data Analysis	40	14.71

Digital Economics	39	14.34
Digital Innovation	35	12.87
Cybersecurity	32	11.76
Digital Marketplace Management	31	11.40
Digital Communications	29	10.66
Digital Knowledge Management	28	10.29
Financial Technology	23	8.46
Digital Entrepreneurship	15	5.51

6. Conclusion

This study uncovered a central problem with the Syrian educational system related to the students' level of digital skills and a necessity for providing training on a wide range of digital skills, as well as integrating modules that support digital skills into public higher education institutions to meet the evolving market needs. Moreover, it illustrates the existence of a big room for improvement. Digital skills are relegated to one or two modules at public universities, and computer skills are not enough to acquire the needed skills. A modern, multidisciplinary, and innovative curricula modernization will allow better training for the next generation of professionals to acquire the actual competencies required to access the labor market and satisfy its demands. This study highlights the necessity of offering training on digital skills and possibly creating relevant LLL courses for alumni, managers, and professionals.

The results of this study have indicated that Syrian public universities would benefit from the enhanced digital skills of university students. Students will integrate digital technologies into their future jobs and business models as a catalyst for change that will help them face future and current crises like COVID-19. This digitalization will diminish social, geographical, and gender disparities. Moreover, Syrian firms will be competitive, improve their productivity, and take advantage of opportunities in the digital economy, particularly Fintech solutions, to secure more funding. Furthermore, improved curricula modernization in line with labor market needs will increase graduates' employability.

To conclude, policymakers and managers at Syrian higher education institutions should consider this experience of moving to distance learning during COVID-19 as an opportunity further to enrich the digital content of universities' curricula. Integrating new modules that address the evolving market needs and offer training on digital skills to students will pave the way to a higher quality of education, contributing to sustainable development in post-conflict Syria. This upskill requires building the capacity of academic staff at Syrian public higher education on the evolving digital skills and improving those institutions' digital infrastructure.

This study's main limitation is that it focused only on students of Syrian public higher education institutions. The future research area could be related to exploring the status quo of digital skills at Syrian private higher education institutions. However,

we do not expect them to be much different. In addition, this study concentrates on Business and Economics and Engineering students, investigating the digital skills' needs of other disciplines that may come with different digital needs. These will constitute venues for future research.

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