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Needed MIS Competencies to the Job Market: Students' Perspective

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ABSTRACT: *The purpose of this paper is to investigate and identify the sets of competencies that are commensurate with employability requirements. The study follows a quantitative, deductive, and positivist approach. A sample of 62 Lebanese students majoring in management information technology and management information systems (MIT/MIS) was selected conveniently based on the participants' willingness to participate. Students belonged to three Lebanese universities. The research capitalizes on a survey questionnaire divided into three sections. The first section includes knowledge questions, the second section constitutes five parts that address different sets of competencies, and the third section constitutes demographics. Questions and statements followed different styles. Collected data were analyzed using the IBM SPSS version 26.0 package. Data analysis used descriptive, factor, and linear regression analyses. The validity and reliability of the questionnaire were very favorable. Results identified seven factors, each factor constituting 3 to 10 elements. These were condensed using a variable transformation technique and obtained weighted sums modeled using regression analysis. As a result, a competency model was assessed based on the students' current competencies against the necessary employability competencies. The research outcomes serve as a boost to the MIT/MIS competencies theoretical foundations in the context of Lebanon. Moreover, results, though not generalized, serve as an eye-opener for future research. Several recommendations posit the implications to policymakers in higher education and employers in the ICT sectors and other technology-based companies.*

KEYWORDS: HEIs, MIS Curriculum, Competencies, Job Skills, Job Markets

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INTRODUCTION

Cedefop, an agency of the European Union, reports that "Matching Skills and Jobs provides a series of indicators on skills and labor market mismatches" (Cedefop, 2023a, para 1). Job mismatches are reported from countries around the globe (ILO, 2015); with common comments insinuating that academic Institutions of Higher Education (HEIs) are not supplying the job market with graduates prepared with the skills and competencies regarded as fundamental to carry out the job duties. Information and Communications Technology (ICT) skills, Information Technology (IT) competencies, and Information Systems (IS) skills are of interest to this paper. In 2007, "In almost all Member States of the European Union, more than 40% of businesses believed that the difficulty in filling open positions for ICT specialists was largely due to a lack of relevant educational and/or training credentials" (Cedefop, 2023b, para 1). According to ILO (2015), several forces impact the strength of the skills-jobs gap, namely labor force mobility and work organization demanding flatter structures and more soft skills; technology development and innovation stipulating higher-level skills in STEM (Science, Technology, Engineering, and Mathematics); ICT skills; and climate change and the transition to the green economy requiring environmental awareness and new skills commensurate with green technology and green economy. The outcomes of the abovementioned changes created new requirements for graduates who are better trained in "talents in team collaboration, taking initiatives, leadership, and management, as well as interpersonal and cross-cultural communication" (ILO, 2015, p. 2).
This paper has the following objective:

1. Assess students' opinions about the required Management Information Technology Competencies in the current job market.
2. Assess the factors that influence the existence of a competencies gap concerning the job market needs.

This paper constitutes section one with an introduction to the subject and depicts the objectives. Section two presents the literature review covering the theoretical basis and relevant empirical research, section three addresses the research methodology. Section four covers the results and their discussion, and section five concludes the paper.

LITERATURE REVIEW

The Skill-based Approach (SBA)

According to Bassellier, Reich, and Benbasat (2001), "Competence is merely a "fit" between a person and a task. SBA assumes a pre-defined assignment. When a business is looking to hire someone or develop an efficient training program, this attention to a single task might be helpful" (p. 8). The current study considered SBA because the objective is to identify the necessary competencies upon students' graduation that may increase employability chances for a job task.

Therefore, Bassellier et al. (2001) posit that "A skill-based approach focuses on the bare minimum of abilities that an employee must possess to perform their job effectively" (p. 8). Moreover, Davern (1996) asserts that "SBA emphasizes that the employee's abilities and the work specifications should match." Furthermore, Marcolin et al. (2000), building upon Bassellier et al.'s views, define user competence "as the user's capacity to utilize technology to the utmost extent possible in order to maximize performance on particular work assignments." Bassellier et al. (2001) comment that "Embracing the skill-based approach entails looking for a fit between a user's talents and the work at hand and acknowledges that competence precedes performance" (p. 8). Currently, Subhashini, Rubitha, & Chitra (2022) posit, "The skill-based approach attempts to improve education's effectiveness and efficiency, as well as people's knowledge and abilities, and it trains people to be the future's leaders" (p. 173). Consequently, IT-related HEIs' curricula may benefit from SBA to design "A modern curriculum that uses learner-centric teaching methods and draws inspiration from outside-of-class experiences to conduct learning activities" (ibid). User competencies achieved with a contemporary curriculum include "Skills in creativity, critical thinking, interpersonal relations, and social responsibility. All have an impact on success in life, the workplace, and citizenship" (ibid).

Cognitive Thinking Theory

Drinko (2012) explains that cognition is "anything relating to intellectual pursuits" (paragraph 5) and that this includes "Recalling, thinking, and reasoning since cognition is anything involving conscious thought" (ibid). Since university students make decisions regarding their academic programs, personal choices, and future jobs, cognition is key in this study. Their choices are the consequence of their reasoning, consideration, and memory. In addition, Forehand (2019) claims that "The construction of assessments (tests and other evaluations of student learning), curriculum (units, lessons, projects, and other learning activities), and instructional strategies like questioning techniques are all informed or guided by the principles of Bloom's Taxonomy" (para 2). Armstrong (2010) further claims that Bloom's Taxonomy offers more skills for "Recalling, Understanding, Applying, Analyzing, Evaluating, and Creating." Along with the abovementioned activities, Higher Education Institutions provide supplemental and extra-curricular activities for students to balance their mental and physical activity from one side and from the other to support their professional exposure to the job market. Drinko (2021) suggests six additional activities to enhance cognitive thinking, including "lowering stress, engaging in cardiovascular activity, obtaining appropriate rest, using simulations to generate ideas to improve brain function, thinking aloud, and concept mapping" (para. 4). Additionally, Hashem et al. (2022) claim that "When a person embodies the organization's mission, beliefs, and goals, cognitive thinking occurs, according to Towers Perrin's ISR Model for engagement (2015)" (p. 17), which "generates a sense of community and productive contribution to the organization" (Knight, 2011). Students are typically active in campus life, which inspires them to pursue their studies with zeal, enjoyment, and purpose. Having insight into their future status as employees will enable them to logically assess the objectives and guiding principles of the planned employer thanks to cognitive thinking. As a

result, this idea relies on the "Sustainable involvement that nearly exclusively emphasizes the relational and cultural aspects of the work" (Towers Watson, 2012, p. 7).

Management Information Skills

"Thus, MIS curricula should ensure that students receive both a general education and a MIS/MIT education, as well as that they reflect the current and anticipated needs of industry, which includes for-profit, nonprofit, and governmental organizations that ultimately employ MIS/MIT graduates." (Stevens, Totaro, and Zhu, 2011, p. 85). For example, recorded skills needed after the Financial Crisis by Management Information Systems/Information Technology graduates include the ability to handle and deliver quality information (Alzoubi, 2020), i.e., information literacy, knowledge in recognizing and assuring quality systems (to provide quick response to emerging changes and speed in decision-making, especially during crises) (Al-Hayaly, 2011; Dahham, Atu, & Abdullah, 2020), and integrated systems' use within the broad supply chain of the organization (Dalloul, binti Ibrahim, & Urus, 2023). However, it is essential to define competence to have a more concrete and clearer view of the needed graduate competencies. The European Commission (2015) posits that competence is "the demonstrated capacity to apply knowledge, skills, and personal, social, and/or methodological abilities in work or study situations and the pursuit of professional and personal development" (p. 22). Additionally, "Competencies may be general or domain-specific. A learning process and educational program's goal is to foster skills" (ibid). Capitalizing on such a definition, and to fully utilize IT in the enterprise, Bassellier et al. (2001) identified three knowledge areas: "...acknowledge the worth and prospective of IT; ...know the capability as well as current and future limitations of IT and assess how rival companies use them; ...remain current with the information assets and the information opportunities." (p. 12).

Subhashini, Rubitha, and Chitra (2022) assert, "Instead of learning by memorization, it is important to develop abilities like comprehension, application, and mental organization during the learning process" (p. 173). Güneş (2018) stresses the need for "competencies like active and independent learning, assertiveness, creativity, developing oneself, and lifelong learning to become more and more important" (pp. 2-3). Moreover, Bronckart (2009) citing Late (1994) and Tardif (1997), contends that "In situations like problem-solving, producing solutions, and cognitive processes, competence is a system of information (procedural, conditional, and declarative)" (para 25). Quiesse (2007), on the other hand, based on Piaget's and Vygotsky's ideas, posits that "Skill is the consolidation of newly acquired knowledge with prior knowledge and knowledge constructed through physical and social engagement." Güneş (2018) asserts that "In a nutshell, today's definition of skill is a cluster of knowledge and cognitive processes" (p. 3). According to the World Bank (2021), a comprehensive skill is needed amid the current trends including the expanding impact of technology, globalization of value chains, urbanization, population changes, and climate change. The skill set consists of digital, technical, socioemotional, and cognitive abilities" (para 1-5).

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Review of Empirical Research

Litecky, Arnett, & Prabhakar (2004) and Klibi and Oussii (2013) contend that several categories of attributes are needed, "Technical skills, general business skills, and personal and interpersonal skills (soft skills), i.e., individual attributes and values" (p. 121). Stauffer (2022) posits, "There are twelve (12) talents known as twenty-first-century competencies that students now need to excel in their careers in the information age" (para 1). These skills are categorized into three sets as follows: Learning skills (four of which are communication, critical thinking, creativity, and collaboration), Literacy skills (three of which are information literacy, media literacy, and technological literacy), and Life skills (which include adaptability, leadership, taking the initiative, productivity, and social skills), are all included. The graduates' preparation for hard and soft skills is based on the aforementioned three categories. Finley (2021) reports that based on about 500 American executives and HR managers, the following competencies were ranked in a 2020 survey as most important for university graduates: The capacity for teamwork, analytical and interpretive thinking, knowledge application in practical contexts, and digital literacy" (p. 7). Additionally, according to Finley, "At least half of employers think it is 'very important' for college graduates to have a variety of mindsets and aptitudes to be successful" (p. 8). Examples of such aptitudes include being "ethical at work, taking initiative, leadership, being empathetic, having a drive for lifelong learning, and being emotional intelligence, among others" (ibid).

Uğur and Turan (2019) stress that HEIs have put an effort and have recognized the need for knowledgeable and skilled knowledge workers in the information society and have been working on their graduates to establish a labor force that fits those needs, notably in the information systems (IS) industry. Hejase, Rkein, and Fayyad-Kazan (2021) asserted similar findings. In addition, Uğur & Turan (2019) contend that "to build a workforce that can drive innovation and development in line with the shifting dynamics and needs of the information society, management information systems (MIS) and business informatics (BI) schools have been formed" (p. 2). Moreover, Uğur & Turan (2019) report 26 critical skills, extracted from 156 professionals' responses, categorized into six (6) different sets of factors as shown in Exhibit 1 herein,

Exhibit 1: Critical Skills of MIS graduates needed by the ICT industry

(1) Capacity to offer IT support; (2) Knowledge of current systems and technologies; (3) Awareness of managerial, security, and systems planning issues; (4) Capacity to create novel applications; (5) Capacity in project management, presentation, and planning; and (6) Knowledge of the business world and teamwork.

Source: Uğur & Turan, 2019, p. 7.

Burns, Gao, Sherman, et al. (2018) report results showing that "In addition to general technical capabilities, with a focus on programming, prospective employers are primarily interested in "soft skills" including written and oral communication, teamwork, and problem-solving abilities." (p.

56). Across the globe, employers are demanding from HEIs more proficiency in soft skills as compared to technical skills in MIS or IT (Stewart, Wall, & Marciniec, 2016; Dunbar, Laing, & Wynder, 2016; Finley, 2021; Stauffer, 2022). When employing graduates in Scotland, "The most important transferrable talents are considered to be willingness to learn, motivation, trustworthiness, and reliability" (McMurray et al., 2016). From a Romanian perspective, Deaconu et al. (2014) report that employers were most pleased with graduates' abilities to be "responsible, efficient planners and organizers activities, and prompt and efficient time managers" (p. 870). According to Pang et al.'s (2019) findings in Hong Kong, "employers rated 26 different competencies as important to varying degrees, but being 'able and willing to learn', 'work in teams and cooperative', 'hardworking and willingness to take on extra work', 'practice self-control', and 'using analytical thinking' were ranked as the top five competencies" (p. 60). Furthermore, Rainsbury et al.'s (2002) research in New Zealand finds that similarly to the abovementioned competencies by Pang et al., five most important competencies (out of 24) include "having computer literacy, oriented towards customer service, working in teams and being cooperative, having self-confidence, and disposed to learn" (p. 12). These were categorized as soft skills.

The above review brings forward the dilemma of graduates' employability with emphasis on the role of HEIs and the needs and wants of employers. Specific needs characterize each economic sector, i.e., ICT-enabled institutions and technology-based firms; however, there is a global agreement that graduates need soft skills besides hard skills within their majors. The ranking of the importance of the particular competencies is subject to the nation's strategic direction and the job market's needs within that nation.

A generic view of graduates' competencies needed in the job market

Abou Jaoude (2015, p. 9), citing the World Bank study, posits that 41% of wage earners do jobs outside their education and skills. It noted that the current status of education is a barrier to employment, especially in the Vocational and Technical Education (VTE) areas (Nassar et al., 2022). In addition, Abou Jaoude adds that the Lebanese labor market faces an increasing number of university graduates who graduate every year in fields that do not meet the economic activity's needs. 55% of companies feel that employees' skills and training of existing employees are major constraints to their business. Moreover, Angel-Urdinola et al. (2013) report that, in particular, employers spot a gap in soft skills, including management, communication, and writing skills, as a significant disadvantage when recruiting graduates.

Habibian, El Zir, and Jaber (2023) report in their World Bank survey that in Lebanon, there are gaps between education and the job market; 63% of respondents agree there is a skills gap in the labor market in Lebanon.

In a study by Bayt.com & YouGov, based on a sample of 1,764 respondents from more than 17 Arab countries with Lebanon (Bayt.com, 2022), results show that "According to 72% of survey participants, automation, ICT, and Artificial Intelligence (AI) are the three elements most likely to affect the nature of work in the future. "Technology plays a key role in driving experience and intelligence in the hiring process as organizational leaders navigate the path to a post-pandemic world," said Ola Haddad, Director of Human Resources at Bayt.com. According to the survey, communication, critical thinking, and computer skills are becoming even more crucial as the younger generation enters the profession" (para 5). Finally, employers from the Middle East and North Africa (MENA) favor candidates with both interpersonal and technical competencies. According to the findings, "soft skills like communication (95%), teamwork (95%), and time management (95%) are thought to be the most crucial" (paragraph 6). More recently, according to Bayt.com (2023a), "Early career graduates revealed that, compared to other industries, IT/Internet/Online Shopping (26%) and Healthcare/Medical Services (16%) employ the most recent graduates" (para 10). Digital McKinsey (2016) stressed the trend towards more technology-savvy graduates in the MENA region, including the GCC countries and others. Those countries are undergoing digital transformation in the coming years to become a leading digital economy.
The abovementioned findings support that university graduates in MIS/MIT have better opportunities for employment since many jobs will be available in Lebanon and the region. However, employers' required competencies have to be acquired.

According to El Annan (2012), local graduates "are too full of academic information and lack technical credentials, as well as communication and interpersonal skills. Before they are prepared to enter the workforce and adjust to the workplace, many graduates need substantial further training" (p. 9). As Annan continues, "Private sector employers need new employees who have technical expertise, professional, and excellent interpersonal competencies" (p. 15). Nauffal and Skulte-Ouaiss (2018, p. 1064) assert that Lebanese employers still tend to (over)focus on specific areas, e.g., science and technology, while continuing to undervalue conventional liberal arts majors, despite having stressed the value they place on the "soft skills" of recent graduates. The top three soft talents that employers look for are ethical proficiency, demonstrated confidence to learn new skills and try new tasks, and effective writing skills, yet none of them are connected to particular technical or other knowledge. Gaps have been reported and identified by researching the competency requirements provided by HEIs and employers. Therefore, HEIs are advised to review, reorganize, and redesign their curricula to assure graduates' employability. Such recommendations apply to all countries across the globe including Lebanon.

García-Álvarez, Vázquez-Rodríguez, Quiroga-Carrillo, et al. (2022) believe that "HEIs must embrace "employability pedagogy," which strengthens the link between the academic environment and the socio-professional reality and ensures the appropriate transition of graduates to working life (p. 204). In addition, the ILO's and the UNICEF's reports "synthesize the Lebanese crisis's impact on the Lebanese labor market and potential business, employment, and training

opportunities" (ILO & UNICEF, 2022, para 5). One major recommendation declared by Ruba Jaradat, ILO Regional Director for the Arab States, "We need to take a people-centered approach to skill development, especially to provide workers and young people with the appropriate technical and soft skills" (para 3). Consequently, according to El-Ghali & Ghosn (2019, p. 8), HEIs must redesign their curricula to include higher-level skills (creativity, critical thinking, and problem-solving) and teach innovation. Finally, many initiatives were adopted in responding to the call for universities to upgrade their curricula. Beirut Arab University (BAU, 2022) launched a project labeled "Elegance" to address the widely acknowledged issue that many university graduates lack the employability skills required by employers and, in addition, that their understanding of ICT lags behind the state-of-the-art and is inferior to that of the organizations they wish to work for. Therefore, the aim is to improve student teaching and learning experiences and graduate employability by strengthening university enterprise partnerships in Jordan and Lebanon. Project 'Elegance' is cofounded by the Erasmus+ Program of the European Union.

Research Merit

This work has merit because it adds to the scarcity of knowledge with Lebanon as a context. As far as the researchers are concerned, very few such work (all areas of competencies) has been published, especially in the MIS/MIT major. However, there could be undeclared 'Thesis/Dissertation Works' or projects within the different Lebanese universities' databases that are not public. Furthermore, similar works dealing with the gap between HEIs' curricula and the job market in accounting or other majors have been published (Hakim & Bizri, 2015; Majzoub & Aga, 2015). However, those dealing with identifying technical competencies in accounting include (El-Mousawi, 2018; Ahmad and Zalzali, 2022), while those dealing with needed competencies due to accounting and automation (Hejase, Rkein, & Fayyad-Kazan, 2021; Rkein et al., 2020; Rkein et al., 2019), competencies gap in general (Hejase, 2023), competencies needed in accounting for the job market (Hejase et al., 2023), journalism and digital media (Aladdine, 2022), and hospitality management (Hejase, Hamdar, and Maraouch, 2014).

RESEARCH METHODOLOGY

Philosophy

This study employed the positivist philosophy, whereby the definition provided by Hejase and Hejase (2013) is "when the researcher assumes the role of an objective analyst, is independent and does not intervene nor is affected by the research's subject" (p. 77). A Positivist produces research questions and hypotheses that may be tested.

Approach

This study employs a deductive methodology that is characterized by scientific concepts. Assuring the validity of the data is evidenced by explaining the cause-effect relationships between variables and the use of controls. Primary data help the operationalization of the concepts to ensure definition

clarity. Additionally, selected concepts are put forth, articulated, quantitatively tested, and reviewed.

Strategy

This study employs a survey technique applied to deductive reasoning. Therefore, a standardized questionnaire is distributed to a predetermined sample of participants. The aim is to collect primary data that is statistically analyzed. Since the investigation is performed at a single moment, a cross-sectional time frame is considered for the temporal horizon.

Sampling and Sample Size

The sample used in this study is non-probabilistic, convenient, and purposeful. Students-participants are those willing to join while having the option to stop freely. As a result, the participants are university students enrolled in three Lebanese institutions' Management Information Systems/Management of Information Technology (MIS/MIT) programs. Table 1 depicts information about these institutions. The population constitutes 500 students enrolled in the MIS/MIT programs in the targeted universities, and 62 valid questionnaires were received.

Table 1. Distribution of student population among universities

No. Students	Institution AA	Institution BB	Institution CC
Total Population	~ 3200	~5500	~ 1000
Population of the MIS/MIT programs	243	~ 200	~ 50

Note: For confidentiality purposes, the university names were coded.
Source: CRDP, 2019, pp. 86-88; Bashir et al., 2022, p. 15.

Moreover, the following paragraphs provide a briefing about each university.

* AA: This is a recently founded private philanthropic university. Its tuition is carefully considered, and the American credit system of education is used. Its MIS/MIT program is the biggest.
* BB: The oldest of the three selected universities. It appreciates thoughtful installations and a range of educational initiatives. Except for its School of Applied Technology, its colleges and institutions use an annual system split into two semesters.
* CC: A private small university, a relatively newly established university with a few educational programs. It adopts the credit system for teaching.

As mentioned earlier, the total MIS/MIT population is about 500 students, and the sample size constituted 62 students. The researchers adopted the methodology of Masoudi & Hejase (2023), Hejase et al. (2023), Younis et al. (2022), and Al Takach et al. (2022) by extracting approximation reliability figures from Hardwick's (2022). That allowed them to clearly understand the sample size's reliability. According to Table 2, the sample size would be between 50 and 75 in the scenario of a population size of 500, a confidence level of 95% [$\alpha = 5\%$], and seeking acceptable reliability of 12% ±2%. This study's sample size of 62 represents a reliability of approximately ± 11.5% at

the 95% confidence level. This indicates that the results won't vary by more than 11.5% in 88.5 of 100 survey repetitions. Such reliability would be acceptable in this type of exploratory investigation.

Table 2. Statistical reliability versus sample size at 95% confidence

Statistical Reliability at the 95% Confidence Level (50/50% proportion characteristic)							
	Population						
Sample Size	100	500	1000	5000	10000	100000	1 Mill+
30	±14.7%	±17.1%	±17.3%	±17.6%	±17.7%	±17.8%	±17.9%
50	±9.7%	±13.1%	±13.5%	±13.8%	±13.9%	±14.0%	±14.1%
75	±5.6%	±10.4%	±10.9%	±11.3%	±11.4%	±11.5%	±11.6%
100		±8.8%	±9.3%	±9.7%	±9.8%	±9.9%	±10.0%

Source: Extracted from Hardwick Research, 2022.

Survey Design

The survey constitutes four sections. Section one consists of 6 questions following a dyadic and multiple-choice style, leading to probe the students' knowledge about their program of study, including having an internship, proper curriculum, and if they advise other students to join the program. Section two probes the students' attitudes toward their curriculum with five parts assessing, in particular, their satisfaction and if they feel there is a gap between their curriculum and the job market, the needed technical/functional/personal skills, the Information and Communications Technology skills, the interpersonal/communication/organizational/business skills, and the ethical principles for the MIT/MIS's profession. This section seeks to assess the extent of the respondents' agreement on statements related to the MIT major using a 5-level Likert scale, i.e., SA: Strongly Agree [5]; A: Agree [4]; N: Neutral [3]; D: Disagree [2], and SD: Strongly Disagree [1]. Therefore, the respondent circles the most appropriate choice to his/her agreement. Section three assesses the Application/Implementation aspects of the program testing continuous education and supplementary activities to the program of study (workshops, guests, and certifications) and two statements probing the COVID-19 impact and if there is a gap in their preparation. Finally, section four depicts the students' demographics with five multiple-choice questions related to sex, age, education, and years of experience (if any).

Data Analysis

Useful information results from giving data meaning (Hejase & Hejase, 2011). Also, descriptive statistics aims to provide cognizance of a collection of data using simple, representative numerical numbers or graphics (Hejase & Hejase, 2013, p. 272). For clarity, tables were created using frequencies, percentages, means, and standard deviations. SPSS, the Statistical Product and Service Solutions from IBM, version 26.0, will be used to analyze the gathered data. Additional

statistical analysis techniques include factor, regression, and chi-square cross-tabulation techniques. In addition, internal reliability was assessed using Cronbach Alpha.

Results and Discussion

Descriptive Statistics

Demographics

Results show that 48.4% of the respondents were males, and 51.6% were females. The age factor has two (2) categories. 88.7% of the respondents were 18 to 25 years of age, and 11.3% were 26 to 33 years old. In addition, 98.4% were completing their Bachelor's degree, while 1.6% were studying for their Master's degree.

Respondents' knowledge analysis

Respondents answered several statements or questions. The results are as follows:
The statement, "I feel I have gained the necessary knowledge of my MIS curriculum to seek a job." 61.2% of the respondents were satisfied with the knowledge acquired from their curriculum, 25.8% were neutral, and 12.9% were unsatisfied. The average mean was 3.61 (std. dev. of 1.03), indicating that the participants, overall, were satisfied to some extent.

In addition, 41.9% of the respondents did professional training via an obligatory internship program to fulfill graduation requirements, whereas 58.1% did not. The commitment of universities to provide professional training before graduation, is varied, leading to such an extent affecting the graduates' preparedness to join the job market comfortably. Moreover, when participants, who did an internship, were asked how much they learned from such an experience, 41.9% said they learned a lot, 43.5% were indifferent, and 14.5% learned very little. Again, in this question, one can observe that the responses depend on which firms they were trained in and what topics were covered during the three-month internship. The average mean for this question was 3.27 (std. dev. of 1.133). It shows that overall, sampled participants were indifferent to how they learned. Researchers like Fang & Lee (2005) suggest that "MIS students pursue MIS internships, especially the more technically focused ones like networking and system analysis and design-related MIS internships because there are strong positive associations between those internships and the frequency of full-time MIS job offers" (p. 398). That recommendation may encourage and motivate students to increase their learning efforts in their internships and, at the same time, uncover that some universities are not preparing their students for employability. However, among the three universities sampled, University AA applies what Narayanan, Olk, and Fukami (2010) have to say about an internship, "placement of a student for a set period of time with a professor, a company supervisor, and some academic credit earned for the degree in the company, sometimes for payment, sometimes not" (p. 61).When students were asked to what extent they were satisfied with their MIS/MIT curricula, 77.5% were satisfied (to some extent, 45.2%; and to a great extent 32.3%), 14.5% were indifferent, and 8% were not satisfied. The average mean here is 3.97 (std.

dev. of 1.024) indicating participants were 'satisfied to some extent'. Also, 72.6% of responding students agreed that they gained adequate IT literacy from their program of study needed to seek a professional job. In addition, 87.10% of the respondents will recommend their major to others at their institutions.

Students' attitude towards their curricula

The different survey components' responses were evaluated using a condensed 3-level Likert scale (grouping for simplicity of the analysis), where "Agreement" is the total of "SA: Strongly Agree," "A: Agree," "N" stands for "Neutral," and "D: Disagree," "SD: Strongly Disagree," and so on.
As mentioned in the survey design earlier, section two is divided into five parts. Therefore, the analysis shall be presented to cover each part individually.

Part 1. Curriculum-based statements

Table 3. Curriculum's outcomes (in percent, %)

	A	N	D	Mean	Std. Dev
The university MIT/MIS program teaches us ethical standards and principles	75.8	14.5	9.7	3.95	0.965
I expect to face language challenges when I start my first job	27.5	38.7	33.8	2.85	1.157
I believe there is a gap between MIT/MIS's education and the real job Practice	43.5	21.0	35.5	3.23	1.193
Online teaching affected my readiness for the workplace	46.8	30.6	22.6	3.47	1.327
I learned my major courses in English, but I assume to work in Arabic language dominating environment	24.2	22.6	53.3	2.48	1.376
I feel I gained all the necessary MIT/MIS knowledge from my major	45.2	27.4	27.4	3.15	1.185
I have the necessary ability to investigate, examine, and perform logical thinking	64.6	25.8	9.6	3.76	1.003
I have the necessary ability to conduct cause-effect analysis and critical analysis	54.8	30.6	14.6	3.52	1.083
I am enabled to Self-management	62.9	27.5	9.6	3.81	1.099

Table 3 shows that respondents were taught ethics (75.8%), the ability to perform research and use logic (64.6%), being autonomous to some extent (62.9%), and on average doing cause-effect analysis and critical analysis (54.8%). Less than 50% feel their education falls behind in getting jobs, some blame online teaching (46.8%), 45.2% believe they got the required program of study knowledge, and about 50% do not have work language concerns.

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Part 2. Technical/functional/personal skills

Table 4. Technical/functional/personal skills needed for the MIT/MIS profession

	A	N	D	Mean	Std. Dev
I gained the ability to select and share priorities with limited resources and manage my assigned job with tight deadlines	66.2	24.2	9.6	3.81	1.069
I have the ability to expect things and adapt to change	79.1	12.9	8.0	4.02	0.983
I am able to practice Professional skepticism (able to detect fraud)	53.2	35.5	11.3	3.63	0.996
I am trained in Decision modeling and risk analysis	40.4	41.9	17.7	3.35	1.026
I learned to Comply with applicable standards, regulations, and laws	64.5	21.0	14.5	3.68	1.083
I am able to write appropriate technical reports	43.6	43.5	12.9	3.40	0.999

Table 4 represents results from part 2 of the second section of the questionnaire that also relates to the curriculum. A significant and favorable outcome is that 79.1% of the respondents (with mean=4.02, std. dev.=0.983) claim they learned to be proactive and adapt to change that is considered highly required by employers (Acosta-Cárdenas, Rodríguez-Macías, and Caso-Niebla, 2019). Also, 66.2% of the respondents learned to prioritize tasks, work under stress, manage with little resources, and respect deadlines (mean of 3.81 and std. dev. of 1.069). These skills were verified by Gonzalez, Julia, and Wagenaar (2005, p. 48) and Sanchez and Ruiz (2008, pp. 52-53). Sanchez and Ruiz emphasized that the abovementioned skills are required by the United Kingdom, the European Union countries, and Japan. The third top response was learning to comply with applicable standards, regulations, and laws (64.5%, mean of 3.68 and std. dev. of 1.083). This skill is demanded by Lebanese employers (Hejase et al., 2014, p. 1256). These were positive aspects of required skills; on the other hand, respondents revealed weak preparation with the ability to detect fraud, decision modeling, risk analysis, and writing technical reports. According to Villa, Gonzalez, Auzmendi, et al.'s (2007, p. 42) work, these skills are not within the top 17 generic competencies ranked in order of importance. Nevertheless, one may add that these skills can be acquired by training the graduates after employment.

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Part 3. ICT skills

Table 5. ICT skills needed for the MIT/MIS profession

	A	N	D	Mean	Std. Dev
I am knowledgeable in using Advanced Excel applications	62.9	19.3	17.8	3.65	1.216
I have training in Enterprise Resource Planning (ERP)	40.4	25.8	33.8	3.10	1.351
I have expertise in big data analysis, advanced modeling techniques	38.7	29.0	32.3	3.10	1.224
I am knowledgeable in Business Intelligence	53.3	30.6	16.1	3.53	1.097
I have the basics for Information Security	38.8	38.7	22.5	3.26	1.070
I am able to deal with advanced programming (for analyst reporting roles).	32.3	40.3	27.4	3.03	1.159
I have the basics of Networking	50.0	30.6	19.4	3.48	1.264
I am knowledgeable in Internet applications (for positions with small and midsize firms or SMEs)	66.2	25.8	8.0	3.77	1.015

Table 5 depicts the participants' responses about the ICT skills. According to the results, the following skills were ranked in order as highest: Internet applications (in SMEs) with a mean = 3.77 (std. dev. of 1.015), using Advanced Excel applications (mean=3.65, std. dev.=1.216), business intelligence (mean= 3.53, std. dev. = 1.097), and finally Networking (mean=3.77, std. dev.=1.264). These results fit what the researchers Fang & Lee (2005, p. 398) advise MIS students besides pursuing internships, the graduates should focus on more technical internships to include networking and system analysis and design. The three Lebanese universities involved here provide their MIS/MIT students with courses in Networking and System analysis and design or software engineering. A clear weakness is depicted in the areas of advanced programming (32.3% of respondents only agreed), data analysis and modeling techniques (38.7% of respondents agreed), and information security (38.8% of respondents agreed).

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Part 4. Soft skills

Table 6. Interpersonal/communication/organizational/business skills needed for MIT/MIS profession

	A	N	D	Mean	Std. Dev
I am able to function in teams	83.8	14.6	1.6	4.35	0.851
I can interact with different people culturally and intellectually	87.1	9.7	3.2	4.34	0.788
I can work effectively in a multicultural environment	79.0	17.8	3.2	4.27	0.872
I am able to organize and delegate tasks, motivate, and develop human resources	83.9	11.3	4.8	4.21	0.832
I am able to lead others in collaborative assignments and projects (Leadership skills)	79.0	14.5	6.5	4.11	0.889
I can work with the other parties in a consultation process, to analyze and solve problems	88.7	8.1	3.2	4.26	0.808
I am able to integrate different technical concepts and applications	80.7	11.3	8.0	4.00	1.008
I am able to provide out-of-the-box (come up with non-classical) alternatives and solutions	75.8	19.4	4.8	4.03	0.905

The literature review of this paper quoted researchers, among others like Litecky, Arnett, & Prabhakar (2004) and Klibi and Oussii (2013) who stressed personal and interpersonal skills (soft skills); Stauffer (2022) recommended Learning skills (including four critical thinking, creativity, collaboration, and Communication) and Life Skills (including flexibility, leadership, initiative, productivity, and social skills); and Finley (2021) reported needed skills like working in teams and critical thinking. Table 6 provided very positive results related to the recommendations. The participant students agreed that soft skills are highly needed and categorized all the suggested interpersonal, intrapersonal (multi-cultural), and learning skills. The mean values reported for the eight (8) skills/competencies varied between a minimum mean of 4.00 (std. dev.=1.008) and a maximum of 4.35 (std. Dev. = 0.851). Such results are positive and reflect that the universities involved are doing 'a good job' in preparing their students on the soft skills dimension.

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Part 5. Ethical principles

Table 7. Ethical principles needed for MIT/MIS profession

	A	N	D	Mean	Std. Dev
I work with professional behavior and am able to comply with technical standards	71.0	22.5	6.5	4.02	0.932
I am able to deal with and apply the concepts of independence, skepticism, accountability, and public expectations	54.8	33.9	11.3	3.66	1.007
I know the basics of ethics, social responsibility, and good governance	79.1	12.9	8.0	4.10	1.020
I am trained to act ethically and professionally in my MIT/MIS major	71.0	22.6	6.4	4.06	1.006
I learned to apply ethics and law, including the relationship between laws, regulations, and the public interest	74.2	21.0	4.8	4.02	0.967
I know the basics of whistleblowing (reporting bad doings) in ethical dilemmas and resolutions	54.8	38.7	6.4	3.69	0.985
I avoid conflicts of interest situations	56.4	37.1	6.4	3.76	0.970

Table 7 is the last part of section 2, depicting the participants' attitude toward Ethical principles needed for the MIT/MIS profession. The highest-ranked statements dealt with knowing the basics of ethics, social responsibility, and good governance (mean = 4.10, std. dev. = 1.020), acting ethically and professionally (mean = 4.06, std. dev. = 1.006), working professionally and complying with technical standards (mean=4.02, std. dev. = 0.932) and awareness about the ethical relationship between laws, regulations, and the public interest (mean = 4.02, std. dev. = 0.967). Students look like they need further training to cope with concepts of
Independence, skepticism, accountability, public expectations (lowest mean), whistleblowing, and avoiding conflicts of interest situations.

The above skills are encouraged globally by employers. Iqbal, Shaikh, and Jamal, et al. (2023) identified ethics and professionalism among other generic employability skills for millennial graduates in Pakistan. The US government website, Youth.gov (2023), recommends strong work ethics and professionalism. In the Islamic Republic of Iran, professional ethics are required (Masoudi and Hejase, 2023). In addition, Sanchez and Ruiz (2008) reported similar skills in more than twenty European universities that participated in their research. Finally, most Lebanese universities follow liberal arts education and emphasize "Assuming professional and civic roles and responsibilities" (Hejase, 2023, slide 9).

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Applying and implementing skills

Table 8. Application/Implementation

	A	N	D	Mean	Std. Dev
The MIT/MIS program taught me how to use various IT-related software programs	56.5	25.8	17.7	3.58	1.139
The University teaches me according to the American university's curriculum	62.9	29.0	8.0	3.79	1.058
There is a gap between the MIT/MIS program and the MIT/MIS profession	35.5	41.9	22.6	3.18	1.138
COVID-19 is blamed for the gap between university students' preparation and the market requirements	56.5	17.7	25.8	3.53	1.423
The University offers me workshops and extra training in MIT/MIS applications needed in the job market	56.5	24.2	19.3	3.45	1.263
The University offers me certifications in MIT/MIS applications needed in the job market	56.4	22.6	21.0	3.48	1.315
Continuous learning is something I learned at my university	59.7	25.8	14.5	3.74	1.173

Table 8 shows that the statement with the highest agreement was about universities using an American curriculum (62.9%, mean=3.79, std. dev.=1.058). Usually, American teaching is based on liberal arts education that emphasizes "The learning to frame problems in historical and multicultural contexts, working independently and in teams, assuming professional and civic roles and responsibilities, and using expertise in complicated problem-solving in an increasingly dynamic and uncertain world" (Shinn, 2014). The abovementioned is exactly required by many employers locally, regionally, and globally (Hejase, 2023, slide 9; Youth.gov., 2023; Sanchez and Ruiz, 2008). The next competence, ranked based on importance, is that universities are active in directing students towards continuous learning (about 60% agree, mean=3.74, std. dev.=1.173) that is commensurate with three other statements that were agreed upon, though on average, these statements include using IT-related software programs, achieving professional certificates, and receiving extra training through workshops. According to Acosta-Cárdenas, Rodríguez-Macías, and Caso-Niebla (2019), the abovementioned activities are labelled experience needed for employability.

Table 8 probed the statement, "There is a gap between the MIT/MIS program and the MIT/MIS profession." The participants slightly agreed (35.5%), 22.6% disagreed, and 41.9% were neutral. One possible reason here is that students do not have full knowledge about their profession due to the profession's dynamic changes and required new job tasks, but mostly depend on their nearest circles of information. Figure 1 depicts a bar chart of the responses' distribution.

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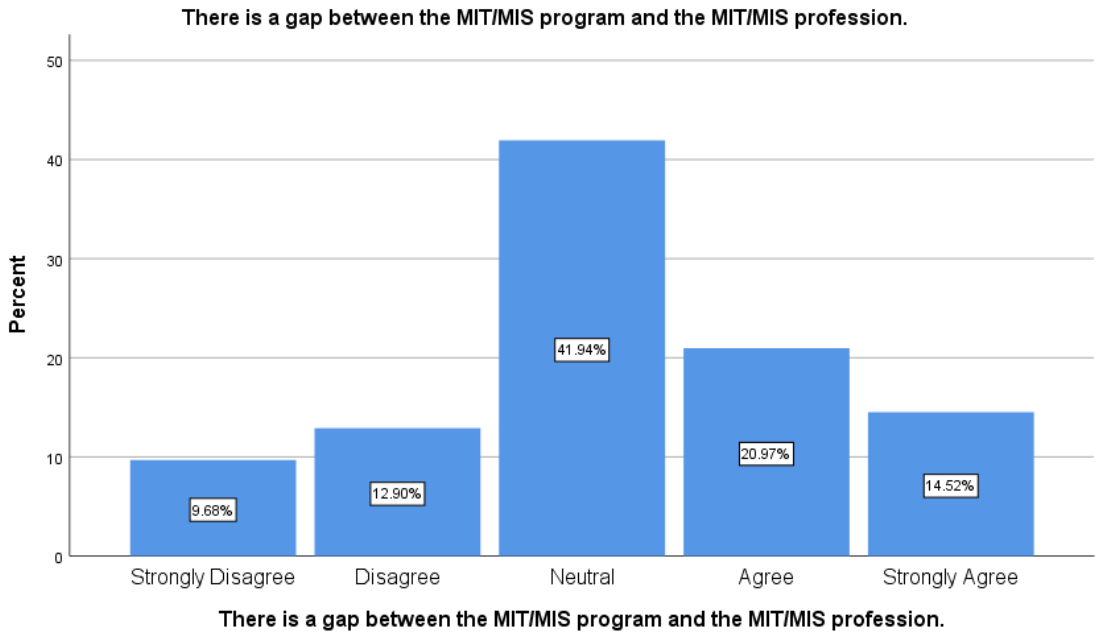

Figure 1. There is a gap between the MIS/MIT program and the MIS/MIT profession

Recalling part 1 of the survey, students were asked to assess the statement: "I believe there is a gap between MIT/MIS's education and the real job practice," their responses were: 43.5% agreed, 21.0% were neutral, and 35.5% disagreed. These results were more realistic since students were in touch with visiting business owners, trainers, and professionals who are themselves part of the job market. Nevertheless, having less than 50% claiming there is a gap is something to be taken seriously because many reports worldwide are claiming similar gaps.

Reliability

The Internal Reliability of the 49-item scale is assessed using Cronbach's Alpha technique. Results show that the 49-item scale produced a Cronbach's Alpha = 0.942; also, Cronbach's alpha if items deleted all fall in the range 0.939 to 0.944 fitting the range 0.9 – 1.0 labeled "Excellent" (Hejase & Hejase, 2013, p. 570), (Burns & Burns, 2008, p. 481). According to Chehimi et al. (2019), “This shows a very strong relationship and demonstrates that the questions chosen are appropriate for the objective of the questionnaire” (p. 1915).

Table 9. Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.942	.947	49

Factor analysis

Principal Component Analysis (PCA) was utilized during the initial testing, followed by rotation. Out of the 49 questionnaire constructs, the results led to the identification of seven (7) factors, with a total variance of 70.023%, and the removal of nine (9) items/elements with three (3) demographic variables and six (6) statements.

Principal component analysis with Promax rotation

The matrix can be factored, according to the examined correlation matrix. The approximate Chi-square for the Bartlett test of sphericity is statistically significant ($\chi 2 = 2064.384$, df = 820, Sig. =0.000), and the Kaiser-Meyer-Olkin measure of sampling adequacy is equal to 0.745, which is regarded as very acceptable (see Table 10). Accordingly, "Since there is a correlation between the variables, their grouping is feasible" (Burns & Burns, 2008; Coakes, 2013). Additionally, it is revealed that "all measures of sampling adequacy (MSA) are greater than 0.50, the acceptable level, after analyzing the resulting anti-image correlation matrix" (Coakes, 2013, page 133. Communalities from factor analyses ranged from 0.500 to 0.859.

According to Burns and Burns (2008), " Communities display the proportion of each variable's variance that may be attributed to the factors that were extracted" (p. 455). The statement "I feel I gained all the necessary MIT/MIS knowledge from my major" thus accounted for 71.0% of the variance, as shown in Table 11. While, among other things, the claim "There is a gap between the MIT/MIS program and the MIT/MIS profession" was responsible for 50.0% of the variance, among other examples. Table 12 also shows the cumulative percentages and the overall variation explained. While the eigenvalue assessment is shown in Figure 2. It demonstrates that seven variables with eigenvalues greater than one were extracted. The variance would be explained by seven factors, which would account for 70.023% of the variance. The seven factors are retained, in accordance with Kaiser's Rule (Burns & Burns, 2008, p. 456), as shown by Figure 2, which also depicts the Scree plot and implies there is one dominant component with six additional factors whose eigenvalues are greater than 1. The statistical findings thus far compel us to continue evaluating further data in order to examine the correlations between the variables. Rotation is thus required. Rotation "reduces the number of complex variables and improves interpretation," claim Hejase, Haddad, Hamdar, et al. (2014, p. 1573). First, the researchers rotated using Varimax, and then they employed Direct Oblimin (details are not included due to space constraints. The Pattern Matrix's data still indicated multiple weights among the variables, including weights with negative signs. In order to obtain good results with clearly defined element weights among the seven factors, Promax with Kaiser Normalization was used. After Promax rotation, Table 13 displays the distribution of the final valid items/elements in the seven factors.

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Table 10. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.745
Bartlett's Test of Sphericity	**Approx. Chi-Square**	2064.384
	df	820
	Sig.	.000

Table 11. Communalities

	Extraction
During the internship, I felt that the University program prepared me well for the practical world.	.660
The university MIT/MIS program teaches us ethical standards and principles.	.681
I believe there is a gap between MIT/MIS education and real job Practice.	.628
I feel I gained all the necessary MIT/MIS knowledge from my major.	.710
I have the necessary ability to investigate, examine, and perform logical thinking.	.585
I have the necessary ability to conduct cause-effect analysis and critical analysis.	.691
I am enabled to Self-management.	.678
I gained the ability to select and share priorities with limited resources and manage my assigned job with tight deadlines.	.670
I have the ability to expect things and adapt to change.	.718
I am able to practice Professional skepticism (able to detect fraud)	.770
I am trained on Decision modeling and risk analysis.	.733
I learned to Comply with applicable standards, regulations, and laws.	.747
I am able to write appropriate technical reports.	.774
I am knowledgeable in using Advanced Excel applications.	.612
I have training in Enterprise Resource Planning (ERP)	.717
I have expertise in big data analysis, and advanced modeling techniques.	.729
I am knowledgeable in Business Intelligence.	.801
I have the basics for Information Security	.600
I am able to deal with advanced programming (for analyst reporting roles).	.775
I have the basics of Networking	.668
I am Knowledgeable in Internet applications (for positions with small and midsize firms).	.671
I am able to function in teams	.783
I can interact with different people culturally and intellectually.	.754
I can work effectively in a multicultural environment.	.578
I am able to organize and delegate tasks, motivate, and develop human resources.	.777
I am able to lead others in collaborative assignments and projects (Leadership skills).	.710

I can work with the other parties in a consultation process, to analyze and solve problems.	.660
I am able to integrate different technical concepts and applications.	.687
I am able to provide out-of-the-box (come up with non-classical alternatives and solutions)	.694
I work with professional behavior and able to comply with technical standards.	.582
I am able to deal with and apply the concepts of independence, skepticism, accountability, and public expectations.	.777
I know the basics of ethics, social responsibility, and good governance.	.706
I am trained to act ethically and professionally in my MIT/MIS major	.859
I learned to apply ethics and law, including the relationship between laws, regulations, and the public interest.	.850
I know the basics of whistleblowing (reporting bad doings) in ethical dilemmas and resolutions.	.679
The MIT/MIS program taught me how to use various IT-related software programs.	.644
The University teaches me according to the American universities' curriculum.	.666
There is a gap between the MIT/MIS program and the MIT/MIS profession.	.500
The University offers me workshops and extra training in MIT/MIS's applications needed in the job market.	.705
The University offers me certifications in MIT/MIS's applications needed in the job market.	.781
Continuous learning is something I learned at my university.	.697

Table 12. Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Component	**Total**	**% of Variance**	**Cumulative %**	**Total**	**% of Variance**	**Cumulative %**	**Total**
1	14.886	36.307	36.307	14.886	36.307	36.307	9.675
2	3.852	9.394	45.702	3.852	9.394	45.702	10.910
3	2.724	6.645	52.347	2.724	6.645	52.347	6.336
4	2.025	4.938	57.285	2.025	4.938	57.285	6.235
5	1.958	4.775	62.060	1.958	4.775	62.060	7.961
6	1.674	4.083	66.142	1.674	4.083	66.142	4.293
7	1.591	3.881	70.023	1.591	3.881	**70.023**	4.335

Extraction Method: Principal Component Analysis.
a. When components are correlated, sums of squared loadings cannot be added to obtain a total variance.

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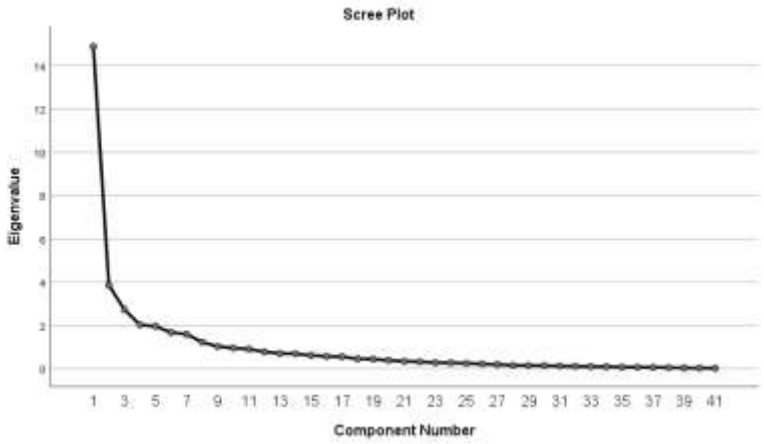

Figure 2. Scree plot

Table 13. Structure Matrix

	Component						
	1	**2**	**3**	**4**	**5**	**6**	**7**
During the internship, I felt that the University program prepared me well for the practical world.		.483		**.711**			
The university MIT/MIS program teaches us ethical standards and principles.	.410	.646		.528	**.667**		
I believe there is a gap between MIT/MIS education and real job Practice.	**.440**			-.475			
I feel I gained all the necessary MIT/MIS knowledge from my major.		.440	.411	**.759**	.420		
I have the necessary ability to investigate, examine, and perform logical thinking.	.532	**.682**	.449		.499		
I have the necessary ability to conduct cause-effect analysis and critical analysis.	.550	**.760**			.513		
I am enabled to Self-management.	.482	**.731**					
I gained the ability to select and share priorities with limited resources and manage my assigned job with tight deadlines.	.496	**.702**			.630		
I have the ability to expect things and adapt to change.	**.703**	.672			.598		
I am able to practice Professional skepticism (able to detect fraud)		**.793**				.439	

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I am trained in Decision modeling and risk analysis.	.492	**.829**					
I learned to Comply with applicable standards, regulations, and laws.	.512	**.826**		.431	.489		.419
I am able to write appropriate technical reports.		**.808**	.442		.517		.433
I am knowledgeable in using Advanced Excel applications.			.424		**.721**		
I have training in Enterprise Resource Planning (ERP)			**.694**				.492
I have expertise in big data analysis, and advanced modeling techniques.			**.762**				.467
I am knowledgeable in Business Intelligence.			**.770**				
I have the basics for Information Security			**.723**				
I am able to deal with advanced programming (for analyst reporting roles).			**.783**				
I have the basics of Networking			**.670**	.584			
I am Knowledgeable in Internet applications (for positions with small and midsize firms).		.529	**.713**		.515		
I am able to function in teams	**.821**	.538			.545		
I can interact with different people culturally and intellectually.	**.838**	.536			.533		
I can work effectively in a multicultural environment.	**.725**	.544					
I am able to organize and delegate tasks, motivate, and develop human resources.	**.864**	.506			.476		
I am able to lead others in collaborative assignments and projects (Leadership skills).	**.810**						
I can work with the other parties in a consultation process, to analyze and solve problems.	**.732**	.639					
I am able to integrate different technical concepts and applications.	**.620**	.480					.509
I am able to provide out-of-the-box (come up with non-classical alternatives and solutions)	**.712**						.548
I work with professional behavior and am able to comply with technical standards.		.412			.467	**.623**	
I am able to deal with and apply the concepts of independence, skepticism, accountability, and public expectations.	.426	.458				**.811**	

I know the basics of ethics, social responsibility, and good governance.	.608	.456			**.762**		
I am trained to act ethically and professionally in my MIT/MIS major	.474	.621			**.825**	.457	
I learnt to apply ethics and law, including the relationship between laws, regulations, and the public interest.	.564	.483			**.791**	.503	
I know the basics of whistleblowing (reporting bad doings) in ethical dilemmas and resolutions.		.418				**.750**	
The MIT/MIS program taught me how to use various IT-related software programs.							**.764**
The University teaches me according to the American universities' curriculum.				.402			**.752**
There is a gap between the MIT/MIS program and the MIT/MIS profession.							**.450**
The University offers me workshops and extra training in MIT/MIS applications needed in the job market.				**.800**			
The University offers me certifications in MIT/MIS applications needed in the job market.				**.833**			
Continuous learning is something I learned at my university.				**.711**		.573	
Extraction Method: Principal Component Analysis. Rotation Method: Promax with Kaiser Normalization.							

Interpretation of factors

The result of the Factor analysis is shown in Table 13. There are seven factors identified after the variables have been rotated. The ten (10) elements that makeup factor one are grouped under the heading "Learning Skills," and this factor alone accounts for 36.307% of the overall variance (see Tables 9 and 10). The "Cognitive Thinking Skills" factor (factor 2; eight (8) items) is responsible for 9.394% of the variation. The third component, titled "ICT Skills," has seven (7) items and accounted for 6.645% of the overall variation. The fourth component (loaded with five (5) items) titled "Supplementary Experience, Literacy, & Continuous Learning" is responsible for 4.938% of the total variance. The fifth component (loaded with five (5) items) titled "Ethical Behavior" is responsible for 4.775% of the total variance. Moreover, 4.083% of the total variation is explained by the sixth factor, "Professionalism," which is loaded with three (3) items. The "Liberal Education & the Profession Gap" component, the seventh factor (loaded with three (3) items), is responsible for 3.881% of the variation. The details of the final seven Factors and their components are shown in Table 14.

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Table 14. Interpretation of Factors Components

Factor	Elements	Weights	% of Variance
1 (10 elements)	1. I believe there is a gap between MIT/MIS education and real job Practice.	0.440	**36.307%**
	2. I can expect things and adapt to change.	0.703	
	3. I am able to function in teams.	0.821	
	4. I can interact with different people culturally and intellectually.	0.838	
	5. I can work effectively in a multicultural environment.	0.725	
	6. I am able to organize and delegate tasks, motivate, and develop human resources.	0.864	
	7. I am able to lead others in collaborative assignments and projects (Leadership skills).	0.810	
	8. I can work with the other parties in a consultation process, to analyze and solve problems.	0.732	
	9. I am able to integrate different technical concepts and applications.	0.620	
	10. I am able to provide out-of-the-box (come up with non-classical alternatives and solutions)	0.712	
2 (8 elements)	1. I have the necessary ability to investigate, examine, and perform logical thinking.	0.682	**9.394%**
	2. I have the necessary ability to conduct cause-effect analysis and critical analysis.	0.760	
	3. I am enabled to Self-management.	0.731	
	4. I gained the ability to select and share priorities with limited resources and manage my assigned job with tight deadlines.	0.702	
	5. I am able to practice Professional skepticism (able to detect fraud)	0.793	
	6. I am trained in Decision modeling and risk analysis.	0.829	
	7. I learned to Comply with applicable standards, regulations, and laws.	0.826	
	8. I am able to write appropriate technical reports.	0.808	
3 (7 elements)	1. I have training in Enterprise Resource Planning (ERP)	0.694	**6.645%**
	2. I have expertise in big data analysis and advanced modeling techniques.	0.762	
	3. I am knowledgeable in Business Intelligence.	0.770	
	4. I have the basics for Information Security.	0.723	
	5. I am able to deal with advanced programming (for analyst reporting roles).	0.783	
	6. I have the basics of Networking.	0.670	
		0.713	

	7. I am Knowledgeable in Internet applications (for positions with small and midsize firms).		
4 (5 elements)	1. During the internship, I felt that the University program prepared me well for the practical world. 2. I feel I gained all the necessary MIT/MIS knowledge from my major. 3. The University offers me workshops and extra training in MIT/MIS applications needed in the job market. 4. The University offers me certifications in MIT/MIS applications needed in the job market. 5. Continuous learning is something I learned at my university.	0.711 0.759 0.800 0.833 0.711	**4.938%**
5 (5 elements)	1. The university MIT/MIS program teaches us ethical standards and principles. 2. I am knowledgeable in using Advanced Excel applications. 3. I know the basics of ethics, social responsibility, and good governance. 4. I am trained to act ethically and professionally in my MIT/MIS major. 5. I learned to apply ethics and law, including the relationship between laws, regulations, and the public interest.	0.667 0.721 0.762 0.825 0.791	**4.775%**
6 (3 elements)	1. I work with professional behavior and am able to comply with technical standards. 2. I am able to deal with and apply the concepts of independence, skepticism, accountability, and public expectations. 3. I know the basics of whistleblowing (reporting bad doings) in ethical dilemmas and resolutions.	0.623 0.811 0.750	**4.083%**
7 (3 elements)	1. The MIT/MIS program taught me how to use various IT-related software programs. 2. The University teaches me according to the American universities' curriculum. 3. There is a gap between the MIT/MIS program and the MIT/MIS profession.	0.764 0.752 0.450	**3.881%**

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Table 14 enables the creation of loads for the seven key study variables. Therefore, using the findings of the factor analysis, it is possible to produce a weighted sum of the variables using SPSS's Transform function. According to Exhibit 2, the following study variables are created.

Exhibit 2. Generation of transformed variables

COMPUTE **Factor1**=SUM(IbelievethereisagapbetweenMITMISeducationandtherealjobPractice*0.440,Ihavetheabilitytoexpectthingsandadapttochange*0.703,Iamabletofunctioninteams*0.821,Icaninteractwithdifferentpeopleculturallyandintellectually*0.838,Icanworkeffectivelyinamulticulturalenvironment*0.725,Iamabletoorganizeanddelegatetasksmotivateanddevelophumanresource*0.864,IamabletoleadothersincollaborativeassignmentsandprojectLeadershi*0.810,Icanworkwiththeotherpartiesinaconsultationprocesstoanalyzeandsol*0.732,Iamabletointegratedifferenttechnicalconceptsandapplications*0.620,Iamabletoprovideoutoftheboxcomeupwithnonclassicalalternativesand*0.712). EXECUTE.
COMPUTE **Factor2**=SUM(Ihavethenecessaryabilitytoinvestigateexamineandperformlogicalthi*0.682,Ihavethenecessaryabilitytoconductcauseeffectanalysisandcriticala*0.760,IamenabledtoSelfmanagement*0.731,Igainedtheabilitytoselectandshareprioritieswithlimitedresourcesa*0.702,IamabletopracticeProfessionalskepticismabletodetectfraud*0.793,IamtrainedonDecisionmodelingandriskanalysis*0.829,IlearnedtoComplywithapplicablestandardsregulationsandlaws*0.826,Iamabletowriteappropriatetechnicalreports*0.808). EXECUTE.
COMPUTE **Factor3**=SUM(IhavetrainingonEnterpriseResourcePlanningERP*0.694,Ihaveexpertiseinbigdataanalysisadvancedmodelingtechniques*0.762,IamknowledgeableinBusinessIntelligence*0.770,IhavethebasicsforInformationSecurity*0.723,Iamabletodealwithadvancedprogrammingforanalystreportingroles*0.783,IhavethebasicsaboutNetworking*0.670,IamKnowledgeableinInternetapplicationsforpositionswithsmallandmi*0.713). EXECUTE
COMPUTE **Factor4**=SUM(DuringtheinternshipIfeltthattheUniversityprogrampreparedmewellfo*0.711,IfeelIgainedallthenecessaryMITMISknowledgefrommymajor*0.759,TheUniversityoffersmeworkshopsandextratraininginMITMISapplicatio*0.800,TheUniversityoffersmecertificationsinMITMISapplicationsneededint*0.833,ContinuouslearningissomethingIlearnedatmyUniversity*0.711) EXECUTE.
COMPUTE **Factor5**=SUM(TheuniversityMITMISprogramteachesusethicalstandardsandprinciples*0.667,IamknowledgeabletouseAdvancedexcelapplications*0.721,IknowthebasicsofEthicssocialrespon

sibilityandgoodgovernance*0.762,Iamtrainedtoactethicallyandprofessionallyinmy MITMISmajor*0.825,Ilearnttoapplyethicsandlawincludingtherelationshipbetweenlawsreg*0.791). EXECUTE
COMPUTE **Factor6**=SUM(Iworkwithprofessionalbehaviorandabletocomplywithtechnicalstandar*0.623,Iamabletodealwithandapplytheconceptsofindependenceskepticismacco*0.811,Iknowthebasicsof Ethicssocialresponsibilityandgoodgovernance*0.750). EXECUTE
COMPUTE **Factor7**=SUM(TheMITMISprogramtaughtmehowtousevariousITrelatedsoftwareprograms*0.764,TheUniversityteachesmeaccordingtotheAmericanuniversitiescurricul*0.752,Thereisagapbetween theMITMISprogramandtheMITMISprofession*0.450). EXECUTE

Having condensed the available data into seven weighted sums representing possible determinants of a sound MIS/MIT curriculum, we proceed to build a testable framework shown in Figure 3.

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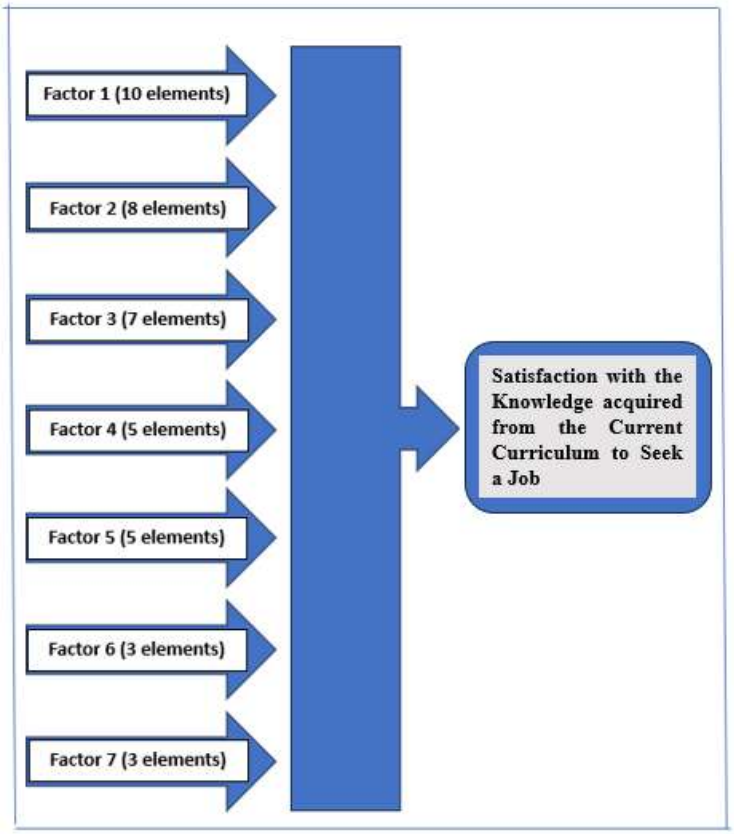

Figure 3. Testable Framework

Regression analysis
The Model.
Dependent Variable:
I feel I have gained the necessary knowledge of my MIS curriculum to seek a job

Independent Variables:
Factor 1, Factor 2, Factor 3, Factor, 4, Factor 5, Factor 6, Factor 7, Age, Sex, and Education Level
Results of the regression model (Table 15), after three cycles of processing, indicate that this model is adequate to fit the data on hand due to the moderate strength of the Coefficient of Correlation (R = 0.649) and the Coefficient of Determination (Adj. R2 = 0.391), respectively; however, the model is also appropriate qualitatively a significant probability of 0.011 ($p < \alpha = 0.05$). ANOVA testing (see Table 16) with F-value = 14.080 (Sig P. = 0.000 < α = 5%) assures the resultant regression equation predicts better than would be expected by chance. Furthermore, all the standardized Betas are statistically significant of values 0.484, 0.348, - 0.289, and 0.233 (Sig. = 0.000, 0.00, 0.011, and 0.077 the first three less than the standard error of 5% and 1%, and the fourth less than the standard error of 10%, respectively). Moreover, the Variance Inflation Factors

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(VIFs) from Table 17 show that there is no multicollinearity (VIFs < 2) (Chehimi et al., 2029, p. 1911; Younis et al., 2021, p. 26; Hashem et al., 2022, p.33) and all the explanatory variables are appropriate to form a causal relationship using regression. This new model shows that the explanatory variables explain 39.1% of the variation in the dependent variable. The explanatory variables support that specific competency factors affect students' knowledge adopted from their majors' curricula as a result of their skill-based programs and their perception based on their cognitive thinking. Moreover, the normality of the model is adequate as supported by Figures 4 and 5. As for the newly suggested research model, Figure 6 illustrates this new outcome.

Table 15. Model Summary[d]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin-Watson
					R Square Change	F Change	df1	df2	Sig. F Change	
3	.649[c]	.421	.391	.803	.069	6.961	1	58	.011	2.266
c. Predictors: (Constant), Factor4, Factor3, Factor1										
d. Dependent Variable: I feel I have gained the necessary knowledge of my MIS curriculum to seek a job.										

Table 16. ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
3	Regression	27.268	3	9.089	14.080	.000[d]
	Residual	37.442	58	.646		
	Total	64.710	61			
a. Dependent Variable: I feel I have gained the necessary knowledge of my MIS curriculum to seek a job.						
d. Predictors: (Constant), Factor4, Factor3, Factor1						

Table 17. Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
3	(Constant)	2.337	.668		3.496	.001		
	Factor4	.134	.031	.484	4.294	.000	.785	1.273
	Factor3	.080	.027	.348	3.024	.004	.754	1.326
	Factor1	-.060	.023	-.289	-2.638	.011	.834	1.199
	Factor6	-	-	.233	1.803	.077	.574	1.741
a. Dependent Variable: I feel I have gained the necessary knowledge of my MIS curriculum to seek a job.								

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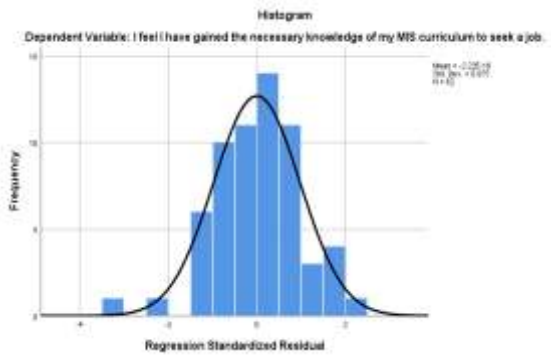

Figure 4. Histogram: Regression Standard Residual

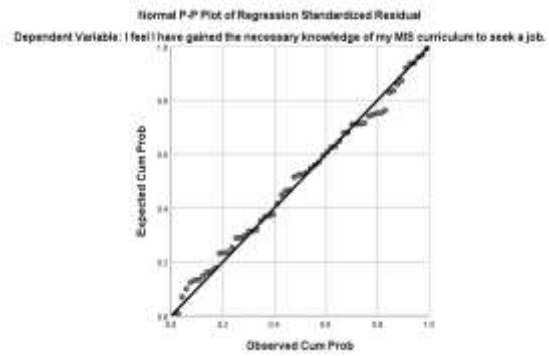

Figure 5. Normal P-P Plot of Regression Standard Residual

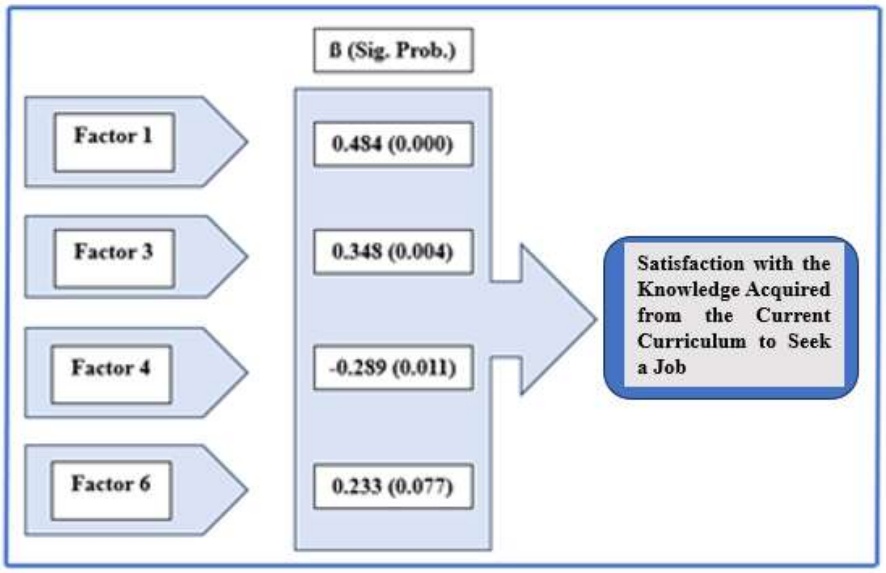

Figure 6. Statistically Significant Framework

Initial findings of this research show that seven factors contribute to the respondents' satisfaction with their MIT/MIS curriculum. However, performing regression analysis did not support the abovementioned, i.e., only three factors were statistically significant at 5% and a fourth factor at 10%. The resultant qualitative equation (based on standardized betas) representing the tested model in Figure 6 is

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"Necessary knowledge was gained from the MIS/MIT curriculum to seek a job" = 0.484*Factor1 + 0.348*Factor3 – 0.289*Factor4 + 0.233*Factor6.

Recalling that Factor 1 (loaded with ten (10) items) was labeled "Learning Skills," Factor 3 (loaded with seven (7) items) was labeled "ICT Skills," Factor 4 (loaded with five (5) items) labeled "Supplementary Experience, Literacy, & Continuous Learning," and Factor 6 (loaded with three (3) items) was labeled "Professionalism." The remaining factors 2, 5, and 7 and the demographic variables were not statistically significant and, therefore, excluded from the regression equation. This equation shows that students were satisfied with their technical ICT literacy and the soft skills represented by learning skills acquired so far. These skills or competency sets are recommended by most employers reported by many researchers (Rainsbury et al., 2002; Pang et al., 2019; Uğur & Turan, 2019; Finley, 2021; Stauffer, 2022, among others). However, Factor 4 with a negative beta indicates that not having enough supplementary training experience that included workshops, panel discussions, visiting employers, certifications, etc. influence negatively the students' outlook for satisfactory preparation to join the job market. Bayt.com (2023b), a leading job site in the Middle East and North Africa (MENA) region, connects job seekers with employers looking to hire and reports in its 2022 survey that 72% of their participants are convinced that new developments in technology and automation, ICT, and Artificial Intelligence (AI) factors are most likely to change the nature of work in the future (Bayt.com, 2022). Such development and continuous advancement are acquired by students before their graduation, provided they are exposed to off-classroom activities and functions. This study's university sample is just a fraction of the university population in Lebanon, with 51 colleges and universities carrying different cultures, educational strategies, and pedagogical models that lead to graduating students with diverse background and preparation because the dynamics of the job market imposes that universities have to invest further in the development of their curricula and supporting infrastructure. It is worth noting that Hejase and Alaeddine (2017) reported on the diversity

of Lebanese universities and provided demographic information about 31 universities that include their research activities. However, Lebanese universities are aware of the abovementioned facts and seek to improve to satisfy their reason of being by graduating employable graduates. Such an improvement is a salient requirement nowadays to achieve accreditation of the program of studies (Oraison, Konjarski, and Howe, 2019). Finally, the fourth factor is Factor 6 related to professionalism, which is statistically significant at the 90% confidence level, though continuous to be a good qualitative indicator of competency that is sought by employers. The resultant regression equation shows a positive beta sign for this variable. The more professional the graduates are, the more satisfied with their program of study, and believe this will help them achieve employability. Factor 6 is in harmony with other researchers' findings (El Annan, 2012; McMurray et al., 2016; Finley, 2021; Dmitriev and Hejase, 2023; Masoudi and Hejase, 2023).

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CONCLUSION

Based on the above analysis and the respondents' opinions a set of competencies was considered significant to get a job in the Lebanese market. Exhibit 3 depicts the competencies selected.

Exhibit 3. Resultant current respondents' competencies

Learning Skills [Factor 1] 1. Seeking to close gaps between MIT/MIS education and real job Practice. 2. Ability to expect things and adapt to change. 3. Ability to function in teams. 4. Interaction with different people culturally and intellectually. 5. Working effectively in a multicultural environment. 6. Ability to organize, delegate tasks, motivate, and develop human resources. 7. Ability to lead others in collaborative assignments and projects (Leadership skills). 8. Working with other parties in a consultation process to analyze and solve problems. 9. Ability to integrate different technical concepts and applications. 10. Ability to provide out-of-the-box (come up with non-classical alternatives and solutions)
ICT Skills [Factor 3] 1. Skills in Enterprise Resource Planning (ERP) 2. Expertise in Big data analysis and advanced modeling techniques. 3. Knowledge of Business Intelligence. 4. Basics in Information Security. 5. Ability to deal with advanced programming (for analyst reporting roles). 6. Basics in Networking. 7. Knowledge of Internet applications (for positions with small and midsize firms).
Supplementary Experience, Literacy, & Continuous Learning [Factor 4] 1. Internship training for the practical world. 2. Having all the necessary MIT/MIS knowledge from my major. 3. Professional training via workshops and extra training in MIT/MIS applications needed in the job market. 4. Professional certifications in MIT/MIS applications are needed in the job market. 5. Continuous learning
Professionalism [Factor 6] 1. Working with professional behavior and the ability to comply with technical standards. 2. Dealing with and applying the concepts of independence, skepticism, accountability, and public expectations. 3. Knowledge of the basics of whistleblowing (reporting bad-doings) in ethical dilemmas and resolutions.

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Nevertheless, respondents may lack further awareness, training, and preparation in another set of competencies depicted in Exhibit 4 herein,

Exhibit 4. Competencies that were not statistically significant in this study

Cognitive Thinking Skills [Factor 2] 1. I have the necessary ability to investigate, examine, and perform logical thinking. 2. I have the necessary ability to conduct cause-effect analysis and critical analysis. 3. I am enabled to Self-management. 4. I gained the ability to select and share priorities with limited resources and manage my assigned job with tight deadlines. 5. I am able to practice Professional skepticism (able to detect fraud) 6. I am trained in Decision modeling and risk analysis. 7. I learned to Comply with applicable standards, regulations, and laws. 8. I am able to write appropriate technical reports.
Ethical Behavior (Ethics, Governance, & Corporate Social Responsibility) [Factor 5] 1. Ethical standards and principles. 2. Knowledge of using Advanced Excel applications. 3. Knowledge of the basics of ethics, social responsibility, and good governance. 4. Acting ethically and professionally in the MIT/MIS major. 5. Application of ethics and law, including the relationship between laws, regulations, and the public interest.
Liberal Education & the Profession Gap [Factor 7] 1. The MIT/MIS program taught me how to use various IT-related software programs. 2. American universities' curriculum [Liberal Education]. 3. Feeling there is a gap between the MIT/MIS program and the MIT/MIS profession.

An eagle's eye look at the three categories in Exhibit 4 leads to the fact that universities lack attention to the highest Bloom Taxonomy declared by Armstrong (2010), who posits that Bloom Taxonomy offers a hierarchy of skills, including "Remembering, comprehending, utilizing, assessing, and finally producing." Based on the adopted university pedagogy strategy, such higher-order skills may be offered or not. For example, researchers like Subhashini, Rubitha, and Chitra (2022) assert, "In the learning process, it is necessary to develop skills such as understanding the learned, transferring it to practice, and structuring in the mind instead of getting knowledge through memorizing" (p. 173). Güneş (2018) stresses the need for "competencies like active and independent learning, assertiveness, creativity, developing oneself, and lifelong learning to become more and more important" (pp. 2-3). However, successful universities nowadays are those that design contemporary curricula to embed learner-centered 'learning activities' that capitalize upon the learners' experiences in and around the classroom. These universities offer "A skill-based approach to increase the effect and efficiency of education, improving the individuals' knowledge and skills and training them to give direction to the future" (Subhashini, Rubitha, and Chitra, 2022,

p. 173). On the other hand, according to Hashem et al. (2022), quoting Towers Perrin's ISR Model for engagement, "Cognitive thinking occurs when an individual lives the organization's mission, values, and goals" (p. 17) or in other words, enjoying a well-designed campus-life experience where students identify with their 'Alma Mater' and therefore enjoy the supplementary experience, learning activities, and challenging higher-order tasks based on project-based or case study analysis activities.

This research confirms that universities need to offer quality education that supports employability to students by performing continuous development of curricula with the direct active participation of partner employers. Researchers have covered extensively, as seen in the first parts of this paper, a full gamut of skills, competencies, and aptitudes needed to match the MIS/MIT job market requirements. This paper, however, confirms four sets of competencies that were statistically significant, offering a clear insight into what a small group of Lebanese universities have achieved as represented by their student participants. The outcome, however, is that much more effort is needed by such universities to create more awareness, more attention, and quick implementation of learning activities directed towards critical thinking, operationalization of knowledge through case studies and projects, and to a higher degree, appreciation the life-long learning attitude.

Limitations

The main limitation was reaching more universities and a larger sample of students. Also, even though the number of participants majoring in MIT/MIS in this study provided a good insight into the attitude and behavior of Lebanese students, neither participants from the public university (there is only one in Lebanon) were involved nor a larger number of private universities. Therefore, this research's findings may not be generalizable but may serve as an eye-opener for further investigations in the future. In addition, this paper identified several sets of competencies, and possibly more may be assessed. So, this exercise must continue to reach an optimum number of qualifications that serve as a basic platform for the recently graduated employees. In addition, this work is to be extended to include instructors and employers to triangulate the results: Efficiently sorting the competencies and creating a focused university-employer effort to mitigate the limitations to bring in skilled graduates who fulfill the employers' expectations.

Recommendations

1. To guarantee the required competencies needed for employability, universities need to upgrade and develop their curricula. For example, "Introducing a 'competency-based educational model' and the use of assessment rubrics along with guidelines for their use regarding the labor market" (E-learning Innovation Center, 2020, para 4).
2. Higher Education Institutions are encouraged to be dynamic enough to accompany the various changes occurring in the academic-business eco-environments (E-learning Innovation Center, 2020).

3. Increasing the effect and efficiency of education and improving the individuals' knowledge, skills, and abilities (Subhashini, Rubitha, and Chitra, 2022, p. 173).
4. Contemporary Information Technology-related HEIs' curricula may benefit from a skill-based approach (SBA) to design "A current curriculum to implement learning activities that are learner-centric" (ibid).
5. Emphasize the implementation of learning activities leading to the improvement of "Critical thinking skills, creativity, interpersonal skills, and a sense of social responsibility. All influence success in life, work, and citizenship" (Subhashini, Rubitha, and Chitra, 2022)
6. Training students in three knowledge areas to exploit IT: "(i) Keeping up-to-date with the information assets and the information opportunities; (ii) Understanding the value and potential of IT; and (3) Knowing the potential as well as current and future limitations of IT by benchmarking how rival companies use them" (Bassellier et al., 2001, p. 12).
7. Employers appreciate competencies like "the ability and willingness to learn, teamwork and cooperation, hardworking and willingness to take on extra work, self-control, and analytical thinking" (Pang et al., 2019, p. 60).
8. Lebanese employers seek "soft skills" of recent graduates (Nauffal & Skulte-Ouaiss, 2018, p. 1064).
9. Bayt.com (2022) reported that "72% of their survey respondents believe that new developments in technology and automation, ICT, and Artificial Intelligence factors are most likely to change the nature of work in the future" (para 2); therefore, universities need to upgrade their curricula content to offer advances in programming, networking, artificial intelligence and machine learning, IT security, and technologies integrated within the supply chains.
10. Other competencies to be adopted in the universities' curricula include project planning and management, information systems development, system analysis and design, and information technology applied in the industry (Uğur and Turan, 2019, p. 7).
11. Business students in general and MIT/MIS students in particular need to have managers from organizations or the industry involved in the development of their employability skills long before they graduate. Visiting universities as guest speakers, and part-time professors, and participating in university-industry advisory groups are proactive ways to accomplish this (Mainga et al., 2022).

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