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Representing teaching staff in Jordanian Universities for the 21st Century skills

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Abstract

The current study aimed to find out the degree to which teaching staff in Jordanian universities represent twenty-first century skills. The data for this research was collected by electronic questionnaire, and its validity and reliability were verified. The research sample consisted of 250 teaching staff. This research analyzes data using descriptive statistics and Four-Way ANOVA. The results showed that the degree of representation of teaching staff in Jordanian universities for the skills of the twenty-first century was average with an arithmetic average (3.57), and the results also showed that the highest score for faculty members representing the skill of effective communication was (3.79), and the lowest score was for the skill of creative thinking. Where the arithmetic average reached (3.33), and there are no statistically significant differences in the number of years of service and the type of college in all skills, and there are no statistically significant differences in the academic rank in all skills except for effective communication skills, and the presence of statistically significant differences in the impact of the university in all skills with the exception of creative thinking skills and high productivity skills, the differences were in favor of the University of Science and Technology. This research recommends universities focus on 21st century skills by integrating them into their programs and employing them in practice.

Keywords: Higher education, 21st Century Skills, Teaching staff, Jordanian Universities

1. Introduction

Higher education is a fundamental pillar of developing societies, completing the process of general education, and providing the learner with skills, abilities and capabilities at the highest level and in a specialized manner, as it qualifies him to enter the labor market with strength and competence (Btah, 2017). Because of the rapid development that took place in the third millennium, which necessitates us to keep pace with these developments, and attention to the necessary and sufficient skills for success in life and work, it became necessary to develop the skills necessary for success, and these skills have begun to be advocated in all disciplines by Partnership for 21st Century Skills (Al-Eid, 2019).In order to prepare learners in a way that suits the labor market in the era of the knowledge economy, and to achieve the requirements of the developed world, institutions must cultivate competencies that suit the skills of the twenty-first century and that relate to developing higher skills for thinking, interacting with different cultures, and using technology and integrating its elements (Hariri, 2020; Derlina, Bukit, Sahyar & Hassan, 2020).

The great challenge that resulted from the accelerating changes in means of communication and its technologies, and the challenges produced by the knowledge economy necessitates that we add qualitative improvements in the two processes: learning and teaching, with what this requires of bringing about qualitative changes in teaching methods and continuous development in improving the skills of faculty members and raising the level of performance)Al-Mahyawi, 2007). The university teaching function is one of the most important and effective jobs that universities perform in preparing students for future life, as it provides them with specialized knowledge, positive and valuable behavioral trends, and all the scientific and practical skills necessary to qualify them to become active members of community service (Al-Janabi, 2009; Canaran and Mirici, 2020).

A general framework for twenty-first century skills

The twenty-first century is characterized by technological progress and the presence of digital technologies in our lives, and at the beginning of this century, organizations and economic entities used different terms to describe the goals that they seek, explained as in the table 1:

Through the official documents of five international organizations and 24 economic entities, the driving forces of twenty-first century skills were divided into three categories as follows: changes and transformations in science and

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Table 1: Terminology used by organizations or economic entities (Jian et al., 2015, p.8) [6].

Organizations / economic entities	*The term*
Partnership for 21st Century Skills of US	Twenty-first century skills
Organization for Economic Cooperation and Development, Singapore	Twenty-first century competencies
European Union	Core competencies
Australia	General capabilities
Hong Kong, China	General skills
Taiwan of China, mainland China	Key competencies

technology, economic and social development, and education development.

Definition of twenty-first century skills

Silva (2009) defines it as a group of skills that include several skills, including: life skills, workforce skills, interpersonal skills, practical skills, and non-cognitive skills.

Stauffer (2020) defines it as: the skills that the learner needs to succeed in their professional life, through the information age. It was divided into three categories: First: Learning skills and called (4C): Critical thinking, Creativity, Collaboration, and Communication.

Second: Cognitive skills (IMT): Information literacy, Media literacy, and Technology literacy.

Third: Life Skills (FLIPS): Flexibility, Leadership, Initiative, Productivity, and Social skills.

- The twenty-first century skills are divided into three main groups: learning and creativity skills, information, media and technology skills, life and career skills (Trilling, & Fadel, 2013).
- The National Research Council (NRC) also held two workshops on the subject of twenty-first century skills, the first in 2007 which was designed around the skills required for the twenty-first century, and the second in 2009 to identify intersections between the goals of science education, reform and twenty-first century skills, with some numerous assessments. For twenty-first century skills to develop clear frameworks for assessing these skills (Koenig, 2011).

Classification of 21st century skills for many organizations

A number of frameworks for twenty-first century skills have been adopted by different educational policies around the world, which have been put forward by many organizations and these frameworks have been developed to meet the requirements of the twenty-first century in order for us to have lifelong learners who keep pace with developments in technology (Chu; Reynolds; Notari; Taveres& Lee, 2016).

According to the Delors UNESCO report (1996) issued by the International Committee for Education that continuing education will go further in 1996, and accordingly UNESCO recommended that education be built on four main pillars: learning to know, learning to do, and learning to live together. And learn to be. As these pillars contribute to lifelong learning and take advantage of the opportunities provided by society. This framework submitted by Delors to UNESCO is the first of its kind, to be the basis for other frameworks (Delors et. al., 1996).

First: A framework based on the Organization for Economic Cooperation and Development [OECD]

Ananiadou and Claro (2009) Developed a framework for the Organization for Economic Cooperation and Development. This framework included three dimensions: communication, information, ethics and their social impact (Ananiadou & Claro, 2009).

Second: Partnership Framework for Twenty-first Century Skills [P21] (2009)

This American organization was founded in 2002, and they envisioned the twenty-first century skills that focused on the field of information technology in education, as it consisted of eleven skills that were classified into three core elements: learning and innovation skills, information, media and technology skills, and life and job skills (Chu et. al., 2016).

Third: the framework of the North Central Regional Educational Laboratory

North Central Regional Educational Laboratory has classified twentieth century skills into four main groups: Digital Age Literacy, Inventive Thinking, Effective communication, and High productivity [14].

Fourth: 21st Century Skills for the American Association of Colleges and Universities

The American Association of Colleges and Universities has developed a framework for twenty-first century skills, by seeking higher education to inculcate skills for learning by doing rather than absorbing information, and learners must prepare for the challenges of the twenty-first century by acquiring: knowledge of human cultures, intellectual and practical skills, Personal and social responsibility, learning (Dede, 2009).

Fifth: Framework for The Assessment and Teaching of 21st century (ATC21ST)

The Assessment and Teaching of the 21st century developed the most important projects that defined the skills of the twenty-first century, which reviewed and analyzed the comprehensive and modern skills of eleven international organizations, where the researchers concluded by dividing

the skills of the twenty-first century into four areas: Ways of thinking, Ways of working, Tools for working, Living in the world (Suto, 2013).

Sixth: The International Society for Technology's Skills in Education Framework

The International Society for Technology in Education (ISTE) has identified a set of skills that focus on making use of the available digital tools, in order to build the learner intellectually, socially and culturally (Suto, 2013).

By reviewing the previous frameworks for the skills of the twenty-first century, we find that a specific list of twenty-first century skills has not been agreed upon due to the difference in education goals among international organizations, but the primary goal of these skills is to educate learners, make them capable of creativity and innovation, assume responsibility, and help them Provided that they possess modern and necessary skills to learn and live effectively in society and at work.

Therefore, this study aimed to identify a degree that the teaching staff represent for twenty-first century skills in Jordanian universities.

Study Questions:

This study attempted to answer the following questions:

- What is the degree to which teaching staff in Jordanian universities represent the twenty-first century skills applied in Jordanian universities?
- What is the degree of difference in teaching practices of teaching staff in Jordanian universities for twenty-first century skills, according to the following variables: (academic rank, number of years of service, college, and university)?

Method

It consists of the following:

Research Design

This was a descriptive- survey research.

Sample of study

The study was carried out at Jordanian universities (Yarmouk University, Jordan University of Science and Technology) in Irbid city, Jordan. Data for the study were collected in November 2020.

The study population was consisted of teaching staff of scientific colleges at (Yarmouk University, Jordan University of Science and Technology), and the sample size was estimated using the table of (Krejcie & Morgan, 1970). However, eventually, 250 respondents completed the test. The table of descriptive statistics is shown in Table 2.

Table 2: Frequencies and percentages according to study variables (N= 250).

Variables	*Categories*	*Frequency*	*Percentage (%)*
Academic rank	professor	66	26.4%
	Co-professor	79	31.6%
	Assistant Professor	105	42.0%
	Total	250	100.0%
Number of years of service	Less than 5	58	23.2%
	5-10	64	25.6%
	More than 10	128	51.2%
	Total	250	100.0%
Collage	Sciences	67	26.8%
	Engineering and Information Technology	94	37.6%
	Medicine	89	35.6%
	Total	250	100.0%
University	Yarmouk	99	39.6%
	Science and Technology	151	60.4%
	Total	250	100.0%

Reliability for tool: The study tool was presented in its initial form to a group of arbitrators in curricula and teaching methods, and the correlation coefficients of each paragraph were extracted between the total score, and between each paragraph and its correlation with the field to which it belongs, between the fields and the total degree, in an exploratory sample from outside the study sample consisting of (40) A teaching staff, and the paragraphs correlation coefficients with the tool as a whole ranged between (0.54-0.91), and with the field (0.68-0.94), which is very appropriate for the purposes of the study. The domain correlation coefficient with the total degree was extracted, and the correlation coefficients between the domains with each other, and Table (3) shows that.

Stability scale: The stability coefficient was calculated using the internal consistency method according to the Cronbach Alpha equation, and Table (4) shows the internal consistency coefficient according to the Cronbach Alpha equation, the stability of the return for the fields and the total degree, and these values were considered appropriate for the purposes of this study.

Data Collection Tools

A questionnaire of the skills of the twenty-first century.

This tool was built with reference to theoretical literature, books, researches and previous studies that researched the skills of the twenty-first century, including the skills of

Table 3: Correlation coefficients between fields and the overall degree related to twenty-first century skills

	Skills of the digital age	*Inventive Thinking skills*	*Effective communication skills*	*High productivity skills*	*Effective communication skills*	*Twenty-first century skills*
Skills of the digital age	1					
Inventive Thinking skills	.707(**)	1				
Effective communication skills	.731(**)	.690(**)	1			
High productivity skills	.726(**)	.738(**)	.813(**)	1		
Twenty-first century skills	.826(**)	.815(**)	.845(**)	.857(**)	1	

* Statistical function at the significance level (0.05).
** Statistically significant at the level of significance (0.01).

the twenty-first century from The North Central Regional Educational Laboratory (NCREL, 2003), the study (Koenig, 2011), and the study (Shalaby, 2014), study (Al-Mansour, 2018), study (Bateen, 2019), and study (Eid, 2019) .

The study tool (questionnaire) consisted of two parts:

The first part: It includes general information about the teaching staff Who will fill out the questionnaire.

The second part: It includes thirty-five paragraphs divided into four skills, namely (skills of the digital age (information and technology skills), creative thinking skills, effective communication skills, and high productivity skills), and the table as in Appendix (1), attached.

Data Collection

The questionnaires were distributed to the study sample by the office of the Dean of the College of Education at Yarmouk University, the Public Relations and Media Unit at the University of Science and Technology, and the emails of teaching staff. Data were collected after answering the paragraphs of the questionnaire by the target sample. A five-step Likert scale of approval ratings was used. The following scale was adopted for the purposes of analyzing the results: from 1.00 - 2.33 low, from 2.34 - 3.67 medium, and from 3.68 - 5.00 large. Data were analyzed using SPSS statistics software.

Data Analysis

The relevant frequency distribution tables have been created. 4-way ANOVA was used to demonstrate relationships between categorical variables, and the level of statistical significance was set at a P-value of ≤0.05.

Table 4: Coefficient of internal consistency Cronbach Alpha and Repetition Stability for Domains and Overall Score

Domains	Stability of replay	Internal consistency
Skills of the digital age	**0.91**	**0.90**
Inventive Thinking skills	**0.93**	**0.90**
Effective communication skills	**0.89**	**0.92**
High productivity skills	**0.90**	**0.92**
Twenty-first century skills	**0.92**	**0.94**

Findings

Research question 1: What is the degree to which teaching staff in Jordanian universities represent the twenty-first century skills applied in Jordanian universities?

To answer this question, the arithmetic averages and standard deviations of the twenty-first century skills applied in Jordanian universities were extracted, and the table below illustrates that.

Table (5) shows that the arithmetic averages ranged between (3.33-3.79), where effective communication skills came first with the highest mean of (3.79) and a high level, while creative thinking skills came in last place with a mean of (3.33) At a medium level, the mean of the twenty-first century skills as a whole was (3.57), with a medium level.

Research question 2: What is the degree of difference in teaching practices of teaching staff in Jordanian universities for twenty-first century skills, according to the following variables: (academic rank, number of years of service, college, and university)?

The means and standard deviations were calculated according to academic rank, number of years of service,

Table 5: Means , Standard deviations of the twenty-first century skills applied in Jordanian universities arranged in descending order according to the Means.

Level	*Standard Deviation*	*Mean*	*Skills*	*NO*	*Rank*
High	.784	3.79	Effective communication skills	3	1
High	.639	3.68	Skills for the digital age (informational and technological skills)	1	2
Average	.723	3.54	High productivity skills	4	3
Average	.707	3.33	Creative thinking skills	2	4
Average	.636	3.57	Twenty-first century skills		

college, and the university, as shown in Table (6). There were clear differences between the averages, and indicated some differences in the degree to which teaching staff in Jordanian universities represent the skills of the twenty-first century by rank Academy, number of years of service, college, and university.

Table (6) shows that there are no statistically significant differences (α= 0.05) due to the impact of academic rank in all skills except for effective communication skills, and there are no statistically significant differences (α= 0.05) due to the effect of the number of years of service and college in all skills. There were statistically significant differences (α= 0.05) due to the

Table 6. means and standard deviations according to the study.

Variables	*Categories*	*Mean &SD*	*Skills of the digital age*	*Inventive Thinking skills*	*Effective communication skills*	*High productivity skills*	*Twenty-first century skills*
		Mean	3.58	3.25	3.48	3.32	3.41
						professor	SD
						Academic rank	Co-professor
			0.757	0.790	0.901	0.785	0.743
	Assistant Professor	Mean	3.67	3.33	3.97	3.64	3.64
		SD	0.568	0.688	0.699	0.664	0.586
	professor	Mean	3.74	3.39	3.84	3.59	3.63
		SD	0.606	0.667	0.715	0.703	0.586
		Mean	3.71	3.42	3.81	3.62	3.63
						Less than 5	SD
						Number of years of service	5-10
			0.676	0.677	0.759	0.779	0.624
	More than 10	Mean	3.79	3.36	3.89	3.65	3.66
							Less than 5
		SD	0.531	0.611	0.632	0.625	0.539
	5-10	Mean	3.61	3.28	3.72	3.44	3.50
		SD	0.666	0.764	0.859	0.735	0.681
		Mean	3.52	3.17	3.61	3.51	3.44
						Sciences	SD
						collage	
			0.652	0.736	0.701	0.677	0.638
	Engineering and Information Technology	Mean	3.75	3.42	3.83	3.55	3.63
		SD	0.522	0.614	0.700	0.639	0.523
	Medicine	Mean	3.72	3.37	3.87	3.55	3.62
		SD	0.723	0.762	0.907	0.838	0.730
		Mean	3.55	3.29	3.63	3.49	3.48
					University	Yarmouk	SD
			0.616	0.611	0.743	0.680	0.570
	Science and Technology	Mean	3.76	3.36	3.89	3.57	3.63
		SD	0.642	0.764	0.797	0.750	0.671

Table 7: 4-way ANOVA Analysis

Source	*Sum of Squares*	*df*	*Mean Squares*	*F*	*Sig*
Academic rank	1.483	2	0.742	1.875	0.156
Number of years of service	0.059	2	0.029	0.074	0.929
College	0.578	2	0.289	0.731	.4830
University	1.531	1	1.531	3.869	0.050
Error	95.734	242	0.396		
Total	100.786	249			

university's effect in all skills except for creative thinking skills and high productivity skills. The differences came in favor of science and technology. To demonstrate the significance of the statistical differences between the mean, the quadruple analysis of variance was used for the tool as a whole, Table (7).

Results in Table (6) showed that there were no statistically significant differences between the averages, as the probability values of the academic rank, the number of years of service, and the college were greater than (0.05). This means that the degree of teaching staff representing twenty-first century skills in Jordanian universities was not affected by academic rank, number of years of service, and college. Rather, there were statistically significant differences between the averages of the university's impact, and the differences were in favor of science and technology.

Discussion

Discuss the results of the first question: What is the degree to which teaching staff in Jordanian universities represent the twenty-first century skills applied in Jordanian universities?

This study established the concept of twenty-first century skills as a necessity for teaching staff representation. These correspond to the skills included in The North Central Regional Educational Laboratory.

The teaching staff possessing effective communication skills to emphasize the important role of communication in the process of conveying ideas, exchanging feelings, reviewing news, transmitting views, correcting positions and providing information, which makes the communication process one of the basics and components of higher education institutions.

Discuss the results of the second question: What is the degree of difference in teaching practices of teaching staff in Jordanian universities for twenty-first century skills, according to the following variables: (academic rank, number of years of service, college, and university)?

The study focused on teaching staff representing some 35 standards of twenty-first century skills. The research questions focused on overall results in addition to significance tests to determine differences based on academic rank, number of years of service, college, and university.

Intermediate levels of representation of 21st century skills indicate that teaching staff do not always apply these skills in their work environment.

The reason is that all teaching staff go through the same conditions, different training courses and competencies that the university seeks in the performance of a teaching staff, and that teaching staff fulfill their roles by working to implement the goals, plans and policies in force in Jordanian universities.

Conclusion and Suggestion

Jordanian universities must integrate and incorporate the skills and knowledge of the twenty-first century into their programs by forming a leadership team that paves the way for such integration, making the application of twenty-first century skills a necessary priority, and employing them to benefit from them in meeting the needs of society and the labor market.

And holding specialized training courses to train faculty members in universities on the skills of the twenty-first century, and making use of the lists of twenty-first century skills contained in the research, and preparing similar studies on larger samples to include various universities of higher education in Jordan

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Appendix (1)

The paragraphs of the questionnaire Please tick (✓) in the box that agrees with your opinion in front of each of the following paragraphs:

	First: Skills of the digital age (information and technology skills)	*Grade grades*				
NO	Standards	Very large	large	Medium	Few	Very few
1	Directs learners towards the sources of information included in the course.					
2	Learners are encouraged to refer to various external sources.					
3	Learners are urged to adhere to scientific honesty in information exchange.					
4	Designs electronic courses.					
5	Uses blogs and online platforms.					
6	Include educational situations and experiences that help learners analyze information from different sources to address issues and problems.					
7	Demonstrates to learners the ethical and legal standards in using technological knowledge.					
8	Introduce learners to methods of evaluating the information they access.					
9	shows the importance of technology for learners to achieve science goals.					
10	shows examples of new technologies, explaining their contribution to scientific progress.					
	Second: Inventive Thinking skills	**Very large**	**large**	**Medium**	**Few**	**Very few**
12	Learners get acquainted with Inventive works.					
13	Encourages individual and group activities.					
14	Encourages manual work.					
15	Touches on how to overcome the difficulties of learners.					
16	It strengthens the internal motivation of learners.					
17	Learners gain the skill to impose relationships.					
18	Uses a method of brainstorming to discuss ideas.					
19	Gives learners the freedom to express their ideas.					
20	It encourages the production of new ideas (exotic).					
	Third: Effective communication skills	**Very large**	**large**	**Medium**	**Few**	**Very few**
21	It provides a supportive learning environment for communication.					
22	Continue orally and in writing actor appears.					
23	Uses media devices and means of communication.					
24	Respects and listens to learners' ideas.					
25	Efficiently manages an online interaction.					
26	Maintains confidentiality of information for learners.					
27	It considers the ethical aspects of effective communication.					

	fourth::High productivity skills	**Very large**	**large**	**Medium**	**Few**	**Very few**
28	It gives learners a good time in identifying questions.					
29	*First: Skills of the digital age (information and technology skills)*	*Grade grades*				
NO	Standards	Very large	large	Medium	Few	Very few
30	It appreciates the effectiveness and efficiency of the sources.					
31	Demonstrates to learners the importance of continuous assessment.					
32	Shows learners the productivity of the individual in terms of type.					
33	It describes to learners the productivity of an individual in quantitative terms.					
34	Learners are urged to distribute tasks.					
35	Emphasizes the importance of developing alternative planning.					
36	Urges learners for self-evaluation skills.					
37	Optimized time management.					