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The degree to which female students of the College of Educational Sciences at Al al-Bayt University possess twenty-first century skills and their relationship to some variables درجة امتلاك طالبات كلية العلوم التربوية في جامعة آل البيت لمهارات القرن الحادي والعشرين وعلاقتها ببعض المتغيرات

Feras Alslaiti

Al Albayt University, ferasalslaiti@aabu.edu.jo

Farouq A. Almeqdadi

Al al-Bayt University, falmeqdadi@aabu.edu.jo

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The degree to which female students of the College of Educational Sciences at Al al-Bayt University possess twenty-first century skills and their relationship to some variables

Feras Mahmoud Alslaiti

Farouq Ahmad Almeqdadi

Al al-Bayt University,

Al al-Bayt University

Abstract

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The research aimed to determine the level of 21st century skills possessed by female students at the College of Educational Sciences at Al al-Bayt University. Additionally, the study sought to investigate whether academic year, age, and academic specialization had a significant influence on these skills. The study population for the academic year 2023–2024 consisted of all female students registered in the College. A random sample of 245 students was selected using a regular random technique. To assess the degree to which female students possessed 21st–century skills, the researchers developed a questionnaire titled "21st-Century skills." The questionnaire comprised 48 items categorized into five sections. The investigation yielded the following findings: Female students at Al al-Bayt University's College of Educational Sciences demonstrated a moderate level of proficiency in 21st-century skills. Neither ability connected to the academic year (with the differences favoring the fourth year) nor age (with the differences favoring the older age group; $\alpha = 0.05$) showed any statistically significant differences. Lastly, no skill associated with academic specialization showed statistically significant differences (with the disparities supporting special education specialization).

Keywords: 21st –century skills, female students, College of Educational Sciences, Al al-Bayt University, academic year, age, academic specialization, skills assessment

ملخص البحث :

هدف البحث إلى تحديد مستوى مهارات القرن الحادي والعشرين لدى طالبات كلية العلوم التربوية في جامعة آل البيت. بالإضافة إلى ذلك، سعت الدراسة لتحري درجة تأثير الجنس والسنة الدراسية والعمر والتخصص الأكاديمي في هذه المهارات. تكون مجتمع الدراسة للعام الدراسي ٢٠٢٣-٢٠٢٤ من جميع الطالبات المسجلات في الكلية. وتم اختيار عينة عشوائية مكونة من ٢٤٥ طالباً باستخدام التقنية العشوائية المنتظمة. ولتقويم درجة امتلاك الطالبات مهارات القرن الحادي والعشرين، قام الباحثون بتطوير استبانة بعنوان "مهارات القرن الحادي والعشرين" واشتملت الاستبانة على ٤٨ فقرة مقسمة إلى خمس مجموعات. وتوصل البحث إلى النتائج التالية: أظهرت الطالبات في كلية العلوم التربوية بجامعة آل البيت مستوى متوسطاً من الكفاءة في مهارات القرن الحادي والعشرين. ولم تظهر أي قدرة مرتبطة للعام الدراسي (مع وجود اختلافات لصالح السنة الرابعة) أو العمر (مع وجود اختلافات لصالح الفئة العمرية الأكبر؛ $\alpha = 0.05$) فروق ذات دلالة إحصائية. وأخيراً، لم تظهر أي مهارة مرتبطة بالتخصص الأكاديمي فروقاً ذات دلالة إحصائية (مع وجود فوارق تدعم تخصص التربية الخاصة).

الكلمات المفتاحية: مهارات القرن الحادي والعشرين، الطالبات، كلية العلوم التربوية، جامعة آل البيت، العام الدراسي، العمر، التخصص الأكاديمي، تقويم المهارات

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Introduction

Globally, there have been notable advancements in technology, economy, and culture in the twenty-first century. As societies developed, so did our way of life and occupations. Given this, it is now imperative that we learn new skills to prosper in the quickly evolving digital world. Many academics, decision-makers, and educators have added to the discussion around 21st-century skills in recent years. Zhao (2016), for instance, emphasized the significance of bringing about a fundamental change in the educational system that gives entrepreneurial thinking and a global vision priority. Wagner (2018) also underlined the importance of flexibility and adaptation as necessary traits for success in a time of rapid change. These modern concepts offer a solid foundation for appreciating the significance and exigency of incorporating 21st-century skills into academic programs. An inventive study by Perkins (2019) and Robinson (2009) clarified the vital role that creativity and problem-solving abilities play in navigating the complexities of contemporary existence. Further, as noted by Fullan (2016) and Darling-Hammond et al. (2017), curriculum revision is essential to incorporate the range of dynamic skills needed in the twenty-first century.

Having these abilities improves one's capacity for original and creative thought. To teach students how to examine, assess, and make sense of the information presented, it encourages critical thinking and problem-solving. Project-based learning activities and teamwork promote effective communication and collaboration skills. Teaching pupils how to collect and evaluate data using information technology tools leads to improved technological and graphic analytical skills. When students are taught efficient research techniques, time management techniques, and self-learning skills,

their independence in the classroom increases. As a result, academic institutions and educational establishments worldwide are attempting to incorporate 21st-century skills into their curricula and pedagogies.

According to the Partnership for 21st Century abilities, children need certain skills to excel in school and in the workplace. Among these are work and life skills including self-direction, adaptability, and social and individual accountability. In addition to creativity, inventiveness, critical thinking, problem-solving, teamwork, and communication, other abilities appeared including media culture and the use of digital tools (Al-Kabailat & Muhammad ,2019). Douglas & Hasler (2016) contend, however, that in order for successful youth to thrive both today and in the future, they must learn 21st-century abilities. These abilities cover a variety of ways to work, think, and live. For the workplace, there exist other tools.

Educational institutions and organizations have endeavored to define and integrate twenty-first-century skills into educational systems, responding to contemporary demands and the challenges these systems face. These efforts focus on developing necessary skills for success, incorporating them into curricula, teaching methodologies, and ensuring quality educational outcomes. With this objective, the Partnership for 21st Century Skills was established in the US in 2002 as a human rights group, aiming to incorporate valuable 21st-century skills into educational goals. This integration should provide opportunities for developing and embedding these skills in the classroom (Al-Sebah, 2020).

Through two initiatives, the Program for International Student Assessment (PISA) and the Program for Identifying and Defining Skills, the Organization for Economic Cooperation and Development (Organization of Economics, Cooperation, and Development, 2005) also developed a framework for twenty-first-century skills. The first initiative provided the conceptual underpinnings for the second, which split the skills. Information and technology, life and work skills, and creative education skills are the three domains that most encapsulate the 21st century.

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Ison (2012) states that for children to study in the twenty-first century, a few requirements must be fulfilled. These include effective educational establishments that use techniques to instruct students in problem-solving and critical thinking, as well as designers skilled at producing the kinds of assignments that permit pupils to become proficient in these skills and gain mastery over their cognitive processes. The teachers are capable of guiding these exercises and expanding their understanding of metacognitive processes.

Educational research, such as Al-Zamil's study (2021), identifies a range of 21st-century skills essential for educators. These skills encompass cognitive abilities, practical skills, interpersonal and communication skills, life skills, and those relevant to the labor market. According to Deursen, et al. (2017), 21st-century skills can be categorized into two main areas: foundational and contextual. Foundational skills include those crucial for navigating the modern world, such as technology use, information and communication management, creativity and collaboration, critical thinking, and problem-solving. Contextual skills, as highlighted by Brown (2020) and Smith and Jones (2018), encompass self-direction, flexibility, cultural awareness, moral consciousness, and lifelong learning. These skills empower educators to foster similar competencies in their students.

Problem Statement & Research Questions

Education is no longer static because of the field's constant developments and thoughts on education. In an era marked by the acceleration of finance and information, the meddling of technology in education, and the emphasis on 21st-century skills like creativity, problem-solving, and communication, it needs to embrace a range of tactics and stay up-to-date with advancements. A standard education is adequate and fulfilling. Instead, it is now crucial to place the

student at the center of the educational process to mold his character and provide him with the tools he needs to eventually rise to the position of leadership in society.

To flourish in society and the job market, university students must acquire the skills of the twenty-first century. Kids need to improve their social and technological skills, but they also need to learn the 21st-century skills that are essential in today's workforce. The College of Educational Sciences offers a vital setting for students to improve their abilities, particularly female students. However, evaluating the degree of 21st-century skills that female students at the College of Educational Sciences possess is an ongoing challenge.

According to Habib (2019), for education to truly improve, students need to be taught how to learn and market themselves. People with 21st-century talents can compete and overcome obstacles, It helps close the accomplishment gap between what is required by the labor market and the requirements, as well as being aware of the student's goals and the knowledge he wants to gain from his education.

The issue of twenty-first-century abilities has been the subject of several earlier studies, such as those by Heung (2013), Al-Mahariq (2014), Al-Eid (2019), and Habib (2019). It is also important to ascertain the degree to which female university students will acquire these skills to help them advance in the industry and achieve the highest level of success, given that the Jordanian Ministry of Education and Higher Education prioritizes vocational training to meet the demands of the job market. Due to its necessity, studying became a difficulty as a result.

Most persons who work with educational software are College of Educational Sciences students, particularly those who have graduated from educational institutions' schools of eGiving pupils the knowledge and abilities they need to succeed in the classroom and the job is increasingly crucial. The skills of the twenty-first century are among the most crucial of them. Today, for the teacher to evaluate the software before using it and make sure the desired goals are

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achieved, students must be trained in the production of educational software at the design, preparation, scenario preparation, implementation, and assessment levels (Lateef 2019).

The issue, according to the researchers, was that certain female students at the College of Educational Sciences lacked the necessary twenty-first-century skills and knew not how to handle them. This is because female students at the College of Educational Sciences must nowadays exercise these abilities in line with standards and foundations that are compatible with the learning objectives and acquire them to a high degree. Consequently, to activate the feedback that promotes the evolution of these talents, research needs to determine the extent to which female students at Al al-Bayt University's College of Educational Sciences employ twenty-first-century skills.

Overall, the problem of the current study lies in the researchers' ability to find answers to the following questions:
The first question: **To what degree do female students of the College of Educational Sciences at Al al-Bayt University possess twenty-first-century skills?**

The second question: **Are there statistically significant differences at the significance level ($\alpha = 0.05$) in the degree to which female students of the College of Educational Sciences at Al al-Bayt University possess twenty-first-century skills due to the variables of year, age, and academic specialization?**

Importance of the Study

The importance of studying "the degree to which female students of the College of Educational Sciences at Al al-Bayt University possess twenty-first-century skills" can be divided into theoretical importance and applied importance as follows:

Theoretical importance:

1. Strengthening scientific research: This study makes a contribution to the field of scientific research about the development of students' twenty-first-century skills. The scholarly literature on this subject might be improved and new information can be added by examining the extent to which college students exhibit these abilities.

2. Providing a theoretical foundation: The study helps to establish a theoretical foundation for creating educational plans and pedagogical curricula that support students' acquisition of 21st-century abilities. The results help decision-makers and education researchers make wise decisions about how to improve these essential skills.

Practical importance:

1. Improving the quality of education: The university and college can determine the advantages and disadvantages of the current educational system and take steps to enhance the quality of education and create teaching strategies by knowing the degree to which female students possess 21st-century skills.

2. Getting female students ready for the workforce: In today's workforce, having 21st-century skills is crucial. The degree to which female students possess these abilities can be used to determine what kind of support and training they need to be qualified and successful in their chosen fields.

3. Improving interaction and creativity in the learning process: Getting ready for the twenty-first century is a step toward improving interaction and creativity in the learning process. Pupils with these abilities can communicate more effectively with instructional materials and use principles in original and efficient ways.

4. Encouragement of the curriculum change: Examining the extent to which female students are equipped with twenty-first-century abilities helps to further the curriculum's transition to a more participatory and student-centered format. The

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study's findings can be used to create instructional plans that improve students' interaction and effective learning process involvement in addition to helping them acquire these skills.

Research and Human limitations

Objective limits: the current research was limited to addressing the topic (the degree of possession of twenty-first-century skills by female students of the Faculty of Educational Sciences at Al Al-Bayt University).

Spatial limits: the current research was conducted at the Faculty of Educational Sciences at Al al-Bayt University.

Temporal limits: the current research was applied in the academic year 2023/ 2024

Human limitations: skills and knowledge

Previous Studies

This review explores the existing research on 21st-century skills within educational contexts, with a specific focus on their development and potential influencing factors among female students. Examining these aspects can provide valuable insights into the skills possessed by female students in the College of Educational Sciences at Al al-Bayt University and the potential relationships with variables like academic year, age, and academic specialization.

In the lines that follow, the researchers will highlight a few of the most recent and significant discoveries in the ongoing study. Zaid's (2021) research set out to ascertain the degree to which female students in the psychology department at Princess Noura University's College of Education in the Kingdom of Saudi Arabia possessed 21st-century skills, including those of digital culture, dialogue and communication, creativity and innovation, and communication. To achieve the study's objective, the researcher employed a descriptive-analytical approach and developed a scale with a

numerical value for measurement. The study's conclusions and all of the previously described skills showed how highly competent female psychology department students were overall in the twenty-first century, as measured by the conversation and communication axis, and finally the creativity and innovation axis.

A follow-up study conducted by Al-Bahrawi (2021) aimed to determine the degree to which graduate students in special education demonstrate 21st-century skills. A descriptive survey method was used along with the creation of a five-axes questionnaire. The study sample consisted of 107 graduate students from four Saudi universities: Imam Muhammad bin Saud University, King Saud University, King Abdulaziz University, and King Faisal University. The study found that graduate students in special education possessed a high level of 21st-century competency and that average responses from male and female students differed significantly in terms of high productivity, moral and spiritual values, and comprehensive sustainability skills. For the female pupils in particular, these inequalities were evident. Some variations were statistically significant and linked to the (specialization) variable supporting the average replies of the sample members in the gifted education major were found to be greater than those of their peers in the special education major when it came to creative and inventive thinking skills.

The goal of Ahmed and Muhammad's (2020) study was to help College of Education students become more conscious of their future jobs and to help them acquire 21st-century abilities. To meet the study's goals, both the experimental and descriptive-analytical approaches were used. The 21st Century Skills Scale and the Role Awareness Scale (Future) were applied both before and after an experiment on two groups of the study sample, which was made up of (68) male and female students from the third paper of the English Science Division at the College of Education, Ain Shams University. The study produced a series of findings, one of which was the existence of a statistically significant difference between the experimental group's and the control group's average grades in the post-application of

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presentation tools for the experimental group's advantage. The findings also showed that the average scores of the students in the experimental group before and after using the research tools differed statistically significantly.

However, Jabiri (2022) carried out a study to determine the reality of King Khalid University students' possession of 21st-century skills (learning, creativity, and technical skills) from the perspective of College members at the King Khalid University College of Education. The descriptive and analytical approach was used to accomplish the goals of this study, and after applying At King Khalid University's College of Education, a sample of thirty-five college members completed the study tool (questionnaire). The study's findings demonstrated that, on average, sample members' replies about the fact that King Khalid University students had the capacity for creative thought, metacognitive thought, and problem-solving The technical skills were excellent, and the results showed that the variables of academic rank and current job caused statistical variations in the sample's responses about King Khalid University's role in helping students build 21st century abilities.

Imran (2023) recently did a study to ascertain whether Arabic language teachers in the intermediate stage have 21st-century skills. To accomplish the study's goals, the researcher employed a descriptive methodology. The basic research sample was drawn from the research community, which included one hundred male and female intermediate-level Arabic language teachers. To quantify these abilities, the researcher developed a twenty-first-century skills scale based on information found in psychological and educational literature. The scale's standard features, such as face and construct validity and internal consistency as determined by Cronbach's internal consistency, were then extracted.

The findings demonstrated that Arabic language instructors had 21st-century skills in the intermediate stage and that there is no gender disparity among Arabic language instructors in this stage.

In addition, numerous studies highlight the growing significance of 21st-century skills in the educational landscape. Research suggests that these skills are essential for preparing students for future careers, active citizenship, and lifelong learning (Partnership for 21st Century Learning, 2019). Several studies have explored the integration of 21st-century skills into teacher training programs (Bardach & Molnar, 2023; Jones & Chen, 2022), emphasizing their importance in equipping future educators with the necessary skills to effectively guide students in the 21st century.

Al-Rafaiah and Jawarna (2022) conducted a study to determine the extent to which vocational education teachers were up-to-date with the knowledge of the 21st century through a descriptive survey. The study included a sample of 330 men and women in the south region. The survey included 58 items, divided into 6 domains, to verify the veracity and reliability of the knowledge. The results showed that the level of knowledge acquired by the vocational education teachers was high. There were also statistically significant differences in terms of gender and age, as well as differences in terms of qualification and age, with a statistically significant difference for Postgraduate students and statistically significant differences for those with experience and those with 10 years of experience. Based on these findings, the researcher suggested that the existing teacher training programs should be strengthened.

The 21st century demands a new set of skills, often referred to as 21st-century skills, to thrive in a rapidly changing and increasingly complex world. These skills encompass a broad range of skills including critical thinking, communication, collaboration, creativity, problem-solving, digital literacy, and social and emotional learning (SEL) (P21 Framework, 2018). Equipping students with these skills is crucial for educational institutions, particularly those preparing future educators.

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While research on 21st-century skills development often encompasses diverse student populations, exploring potential gender differences can offer valuable insights. Studies like Lee & Park (2021) investigate potential gender disparities in the development of these skills among high school students. Understanding these potential differences can inform the design of inclusive learning environments and targeted interventions that cater to diverse learning styles and needs.

Research also explores the potential relationships between 21st-century skills and other variables, such as academic achievement and program effectiveness. For instance, studies like Hassan & Ali (2019) examined the needs and challenges associated with developing these skills within specific teacher training programs.

The current study focuses on female students in the College of Educational Sciences at Al al-Bayt University. While existing research provides valuable insights, it is crucial to acknowledge the specific context surrounding these students. Exploring the university's curriculum, pedagogical approaches, and student support systems can offer a deeper context and enrich the understanding of 21st-century skills development within this specific population.

The existing research underlines the growing importance of 21st-century skills in educational contexts and the need to equip future educators with these skills. While research explores various aspects of skill development, including potential gender differences and relationships with other variables, further investigation within specific educational contexts like the College of Educational Sciences at Al al-Bayt University can provide valuable insights. By understanding the degree to which female students possess these skills and exploring potential influencing factors, the present study

can contribute to the ongoing dialogue about fostering crucial 21st-century skills within educational settings and contribute to the development of future generations of educators.

Study Methodology

The researchers used the descriptive survey method to reveal the degree to which female students of the College of Educational Sciences possess twenty-first-century skills and determine the importance of these skills and the impact of some variables on them.

Sample and Population of the Study

The target population for this study included all female students enrolled in the Bachelor's program at the College of Educational Sciences at Al al-Bayt University during the academic year 2023–2024. A random sample of 245 female students from this population was selected and invited to participate in the study. Questionnaires were distributed to the participants, and all completed questionnaires were included in the final analysis. Table 1 presents the distribution of participants by academic year, age, and academic specialization).

Table 1

Distribution of the sample according to the personal information

Variable	N	%
Year		
First	46	18.8%
Second	60	24.50%

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Third	46	18.8%
Fourth and more	93	38.0%
Age		
19 or less	39	15.9%
20	92	37.6%
21	71	29.0%
22 or more	43	17.6%
College		
Physical education	70	28.6%
Special education	45	18.4%
Classroom teacher	75	30.6%
Raising a child	55	22.4%

Table 1 displays the sample distribution according to personal data. With respect to the year-by-year distribution, the group with the highest percentage, fourth and over (38.0%), is followed by the second-year (24.5%), the first and third year percentages (18.8% each one of them). Twenty-year-olds (37.6%) make up the largest group, followed by twenty-one-year-olds (29.0%). 19.9% of the population is the youngest group, and 17.6% is the group that is 22 years of age

and older. Looking at the distribution by college, physical education (28.6%) had the second-highest percentage of graduates from classroom teacher programs (30.6%). proportion is likewise found in raising a child (22.4%), with 18.4% of the sample going to special education.

Study Tool (Instrument)

Following a review of prior research, the researchers worked on implementing the study instrument, a questionnaire designed to gauge how much twenty-first-century abilities female students at Al al-Bayt University's College of Educational Sciences had. The questionnaire has two sections. The first section consisted of the items measuring the demographic details, and the other section evaluated the topics covered in the questionnaire. There were 48 items total in the questionnaire, which were divided into six categories: Social Skills, Collaboration Skills, Critical Thinking Skills, Creativity Skills, Digital Literacy Skills, and Leadership Skills. Eight items were used to measure each of the seven skills. After verifying the validity and reliability of the Arabic translation, the researchers utilized the questionnaire. It was developed using a five-point Likert scale, assigning the following scores to the responses: Extremely High (5 points), High (4 points), Average (3 points), Weak (2 points), and Very Weak (1 point)

Validity of the Tool

The questionnaire was given in its original form to ten highly qualified arbitrators by the researchers to confirm the tool's validity. The arbitrators were asked to rate the items' degree of relevance to the study fields, their degree of clarity, their level of importance, the soundness of the linguistic formulation, and any necessary revisions or recommendations. Following the retrieval of the questionnaire from the Arbitrators, the following modifications were made

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in response to their recommendations: some items were restructured, while others were removed so that the final version of the questionnaire had (48) items spread across the six areas as follows:

1. Collaboration Skills (8 items)
2. Critical Thinking Skills (8 items)
3. Creativity Skills (8 items)
4. Digital Literacy Skills (8 items)
5. Social Skills (8 items) and
6. Leadership Skills (8 items)

Reliability of the Tool

The researchers used the test and retest approach (Test–Re–Test) to determine the instrument's reliability. Specifically, the tool was administered to thirty–one female students who were not included in the study sample and then reapplied to them after a two–week period. After that, the reliability coefficient was extracted by calculating the Pearson Correlation Coefficient between the application and the first and second. The values of the reliability coefficients for each of the questionnaire's six areas (fields) are shown in Table 2. The total questionnaire reliability coefficient was (123), which is satisfactory dependability for the study's goals.

Table 2

The Result of Reliability (Cronbach Alpha)

Domain	Alpha	Item No
Collaboration	0.775	8
Critical Thinking Skills	0.724	8
Creativity	0.763	8
Digital Literacy	0.716	8
Social Skills	0.727	8
Leadership	0.798	8
Total scale "21st century skills"	0.818	48

Table 2 shows the overall reliability of the "21st-century skills" scale, with a Cronbach Alpha score of 0.818 over 48 items. Leadership (alpha = 0.798), creativity (alpha = 0.763), and cooperation (alpha = 0.775) are the domains with the highest reliability. These domains also show good reliability: the Cronbach Alpha for Critical Thinking Skills is 0.724, and the Cronbach Alphas for Digital Literacy and Social Skills are 0.716 and 0.727, respectively, across eight items each. These good results show the stability and reliability of the study scale (Sekaran, 1984) asserts that a measure is considered high quality if its Cronbach alpha value is more than 0.60.

Study Procedure

At Al al-Bayt University, where the population was determined, the sample was completed, and its validity and reliability were guaranteed, as previously mentioned, the researchers were granted the required authorization to carry out the study. The sample members completed the questionnaire to provide data, which was then gathered, transcribed,

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input into a computer, and statistically processed using the Statistical Package for the Social Sciences (SPSS). After interpreting and debating the data, suggestions were made.

Study Variables

Independent Variables

There are three independent variables

1. Age with three levels (19 or Less, 20, 21, 22 or more)
2. Specialization with 4 stages (Special Education, Physical Education, Classroom Teacher, & Raising a child)
3. Educational Year with 4 levels (1st Year, 2nd Year, 3rd Year, & Fourth Year)

Dependent Variable

The degree to which female students of the College of Educational Sciences at Al al-Bayt University possess twenty-first century skills.

Statistical Treatment (Processes)

To answer the study questions, the following statistical processes were used through the (SPSS):

- Frequencies and percentages of the personal and functional members of the study sample.
- Means and standard deviations for the answers of the study sample on all the domains of the study tool.
- Three Way ANOVA.
- Three Way MANOVA.

• The scale was corrected and adopted to measure “21st century skills “for Five– Likert Scales, the means as follows:

- Less than 2.33–low.
- 2.34–3.66– medium.
- 3.67 – 5.00– high.

To provide details, Statistical treatments related to the study questions were used as follows:

1. To answer the first question regarding the degree to which students of the College of Educational Sciences at the University of Jordan possess the technological skills included in the knowledge economy, arithmetic means and standard deviations were used.

2. To answer the second question related to the presence of statistical differences at the significance level ($0.05 > \alpha$) due to the variables of age, specialization, and educational qualification. Arithmetic means and standard deviations were extracted for the degree to which students of the College of Educational Sciences at the University of Jordan possessed technological skills according to the variables of age, and academic qualification. To demonstrate the significance of the statistical differences between the arithmetic means, the “T” test was used for independent data for both age and academic qualification (Independent Sample Test). One–way ANOVA for age.

Results and Discussion

This section presents the findings of the study which aims to recognize the differences in 21st–century skills due the students of Al al–Bayt University to Year, Age, and College. Also, it includes descriptive statistics for participants’ answers to questionnaire items.

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The first question: **To what degree do students at the College of Educational Sciences at Al al–Bayt University possess twenty–first–century skills?**

To answer this question, the means and standard deviation for each domain of " 21st–century skills ", and the total means of them were calculated; Table 3 shows those results.

Table 3
Means and standard deviation for each domain of "21st–century skills " and total means of them

R	Domain	St	Agr
ank	o	ean	andard. eement
		Deviation	Degree
		n	
1	Creativity	0.	Hig
		.83	61 h
2	Critical	0.	Hig
	Thinking Skills	.80	60 h
3	Social Skills	0.	me
		.66	61 dium

4	Digital	0.	me
	Literacy	.57 68	dium
5	Collaboration	0.	me
		.56 60	dium
6	Leadership	0.	me
		.49 62	dium
	Total	0.	me
	Means"21st-century	.65 33	dium
	skills "		

Table 3 demonstrates that respondents strongly agreed that creativity and critical thinking skills stand out, with mean values of 3.83 and 3.80, respectively. Social Skills come next, with a medium agreement mean of 3.66. With averages of 3.57 and 3.56, respectively, Digital Literacy and Collaboration both exhibit medium levels of agreement. A score of 3.49 indicates leadership, which is likewise classified as medium agreement. The "21st-century skills" overall mean is 3.65, indicating a medium degree of agreement.

The second question: **are there statistically significant differences at the level of statistical significance ($\alpha = 0.05$) in 21st-century skills due to (Year, Age, and College) demographic variables?**

To respond to this query, the research domains' means and standard deviations were extracted in total because of the demographic factors. The results are displayed in the tables below. Three-way ANOVA was used to examine significant

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differences between demographic variables and the total number of domains, and Three–way MANOVA was used to examine significant differences between study domains and demographic variables (Year, Age, and College).

Table 4
means and standard deviation for study domains and total of them due to demographic variables (Year, Age, and College)

		Total mean “21st-century skills”							
Year	Mean	Collaboration	Critical Thinking Skills	Creativity	Digital Literacy	Social Skills	Social Skills	Leadership	
First	Mean	3.481	3.72	3.755	3.4	3.4	3.429	3.5	
			6		32	51		46	
	Std . Deviation	0.678	0.55	0.582	0.5	0.5	0.619	0.3	
Second	Mean	3.358	3.62	3.719	3.4	3.5	3.521	3.5	
			5		73	71		44	
	Std . Deviation	0.491	0.61	0.522	0.6	0.5	0.611	0.2	
Third	Mean	3.611	3.86	3.872	3.5	3.7	3.389	3.6	
			1		76	83		82	

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		Std	0.602	0.61	0.628	0.7	0.6	0.628	0.3
		. Deviation	7		23	31		54	
Fourth	Me	3.694	3.91	3.914	3.6	3.7	3.557	3.7	
and more	an	4		91	72		57		
	Std	0.597	0.58	0.661	0.6	0.5	0.611	0.3	
	. Deviation	0		68	97		07		
								Tot	
								al	
			Criti					mean”21st	
		Collabora	cal Thinking	Creati	Digi	Soc	Leaders	–century	
Age	tion		Skills	vity	tal Literacy	ial Skills	hip	skills”	
19	Me	3.478	3.65	3.663	3.4	3.4	3.394	3.5	
	an	4		07	10		01		
	Std	0.614	0.54	0.553	0.5	0.5	0.553	0.3	
	. Deviation	5		68	35		35		
20	Me	3.659	3.92	3.872	3.6	3.7	3.560	3.7	
	an	1		97	69		46		
	Std	0.645	0.58	0.638	0.6	0.5	0.627	0.3	
	. Deviation	0		75	96		18		
21	Me	3.540	3.79	3.931	3.5	3.6	3.417	3.6	
	an	4		39	94		53		
	Std	0.595	0.60	0.643	0.6	0.6	0.618	0.3	
	. Deviation	1		79	58		57		

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more	22 and	Me	3.433		3.67		3.715		3.4		3.6		3.561		3.5
		an		2				83		22				81	
		Std	0.481		0.64		0.509		0.7		0.5		0.635		0.2
		. Deviation		5				42		44				54	
total															
I mean "21st-century skills"															
	College		tion	Collabora	cal Thinking		Creati		Digi		Soc		Leaders		
					Skills	vity		tal Literacy	ial Skills	hip					
Physical education	Physical	Me	3.600		3.81		3.811		3.6		3.6		3.486		3.6
		an		4				05		23				57	
		Std	0.601		0.57		0.669		0.6		0.5		0.593		0.3
		. Deviation		4				68		62				38	
Special education	Special	Me	3.567		3.64		3.794		3.6		3.6		3.614		3.6
		an		7				25		72				53	
		Std	0.651		0.58		0.530		0.7		0.6		0.661		0.2
		. Deviation		6				59		04				99	
Classroom teacher	Classroom	Me	3.645		3.87		3.972		3.6		3.7		3.507		3.7
		an		7				22		38				27	
		Std	0.584		0.58		0.611		0.6		0.6		0.646		0.3
		. Deviation		1				18		63				44	
Raising a child	Raising	Me	3.370		3.79		3.684		3.3		3.6		3.382		3.5
		an		3				98		09				39	

Std	0.561	0.65	0.568	0.6	0.5	0.557	0.3
. Deviation	7	87	85			13	

Table 4 shows apparent differences between the means and the standard deviations of domains of 21st-century skills due to demographic variables (Year, Age, and College). To illustrate the significance of these differences, (Three Way MANOVA) was applied, and Table ٢ shows the results.

On the other hand, Bartlett's Test for Sphericity was conducted as appears in Table 5 the results show no redundancy between variables that can be summarized with some other factors.

Table 4

Correlation Factors between Dependent and Independent Variables (Bartlett's Test of Sphericity

Likelihood Ratio	Approx. Chi-Square	df	Sig.
0.000	118.708	20	0.000

Table 6

Results of MANOVA test on Participants' Perspectives based on the Study's Independent

variable		Value	F	Hypothesis df	Sig.
Year	Wilks'	0.837	2.350	18.000	0.001
	Lambda				

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Age	Wilks'	0.855	2.059	18.000	0.006
	Lambda				
College	Wilks'	0.923	1.037	18.000	0.415
	Lambda				

Table 6 shows a statistically significant Year difference with 21st-century skills; Wilks' Lambda = 0.837, F = 2.350, p = 0.000. Also, the results showed a statistically significant Age difference with 21st-century skills; Wilks' Lambda= 0.855, F = 2.059, p = 0.006.

Table 7

the results of (Three Way MANOVA) to explore the difference in study domains due to demographic variables (Year, Age, and College)

Variable	domain	Sum of square	df	Mean Square	F	Sig.
Year	Collaboration	3.625	3	1.208	3.492	0.016
	Critical Thinking Skills	2.923	3	0.974	2.856	0.038*
	Creativity	7.458	3	2.486	7.390	0.000*

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	Digital	0.363	3	0.121	0.264	0.851
	Literacy					
	Social Skills	1.452	3	0.484	1.355	0.257
	Leadership	0.189	3	0.063	0.165	0.920
age	Collaboration	1.294	3	0.431	1.247	0.293
	Critical	2.591	3	0.864	2.531	0.058
	Thinking Skills					
	Creativity	7.948	3	2.649	7.875	0.000*
	Digital	0.376	3	0.125	0.273	0.845
	Literacy					
	Social Skills	0.849	3	0.283	0.792	0.499
	Leadership	0.342	3	0.114	0.297	0.827
College	Collaboration	1.387	3	0.462	1.336	0.263
	Critical	2.247	3	0.749	2.195	0.089
	Thinking Skills					
	Creativity	2.572	3	0.857	2.548	0.057
	Digital	1.086	3	0.362	0.790	0.501
	Literacy					
	Social Skills	0.436	3	0.145	0.407	0.748

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	Leadership	0.761	3	0.254	0.662	0.576
Error	Collaboration	81.310	235	0.346		
	Critical	80.168	235	0.341		
	Thinking Skills					
	Creativity	79.059	235	0.336		
	Digital	107.686	235	0.458		
	Literacy					
	Social Skills	83.930	235	0.357		
	Leadership	90.035	235	0.383		
Corrected	Collaboration	88.510	244			
Total	Critical	87.624	244			
	Thinking Skills					
	Creativity	90.988	244			
	Digital	112.014	244			
	Literacy					
	Social Skills	89.544	244			
	Leadership	92.470	244			

* Statistically significant at the level of significance ($\alpha=0.05$)

Table 2 shows that:

- There are no statistically significant differences at the level of significance ($\alpha=0.05$) in all domains of study (Collaboration, Critical Thinking Skills, Creativity, Digital Literacy, Social Skills, and Leadership) due to the variable College.
- There are no statistically significant differences at the level of significance ($\alpha=0.05$) in domains of study (Collaboration, Digital Literacy, Social Skills, Leadership) due to the variable Year.
- There are statistically significant differences at the level of significance ($\alpha=0.05$) in domains of study (Critical Thinking Skills, Creativity) due to the variable Year.
- There are no statistically significant differences at the level of significance ($\alpha=0.05$) in all domains of study (Collaboration, Critical Thinking Skills, Digital Literacy, Social Skills, Leadership) due to the variable age.
- There are statistically significant differences at the level of significance ($\alpha=0.05$) in domains of study (Creativity) due to the variable age.

To explore the places of significant difference between descriptive of domain of study (Critical Thinking Skills) due to the variable Year, a post hoc test (Scheffe) was applied; tables below show those results.

Table 8

the results of (scheffe) (Critical Thinking Skills) due to the variable Year

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Year	Mean	First	Second	Third	Fourth and more
First	3.726	–	0.101	–	–
			0.136	0.188	
Second	3.625		–	–	–
			0.236	0.289*	
Third	3.861			–	–
				0.053	
Fourth and more	3.914				–

*** Differences are statistically significant at the level of significance ($\alpha=0.05$)**

Table 8 shows significant differences between " Second " and " Fourth and more ", in favor of the (Fourth and more) category.

To explore the places of significant difference between descriptive of a domain of study (Creativity)due to the variable Year, a post hoc test (Scheffer) was applied; tables below show that.

Table 9

the results of (Scheffe) (Creativity) due to the variable Age

Age	Mean	19	20	21	22 and more
19	3.664	–	–	–	–
		0.209	0.268*	0.052	
20	3.872		–	0.209	–
				0.059	
21	3.931			–	0.216
22 and more	3.715				–

* Differences are statistically significant at the level of significance ($\alpha=0.05$)

Table 9 shows significant differences between " 19 " and " 21 ", in favor of the (21) category.

Table 10

the results of Three-Way ANOVA to explore the difference of total study " 21st-century skills " due to demographic variables (Year, Age, and College)

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Variable	Sum of square	Df	Mean Square	"F" value	Sig
Year	1.286	3	0.429	4.355	0.005
age	0.908	3	0.303	3.075	0.028
College	0.669	3	0.223	2.264	0.082
Error	23.132	235	0.098		
Corrected	26.991	244			
Total					

* Statistically significant at the level of significance ($\alpha=0.05$)

shows that: لم يتم العثور على مصدر المرجع.

- There are no statistically significant differences at the level of significance ($\alpha=0.05$) in the total study" 21st-century skills " due to the variable College.
- There are statistically significant differences at the level of significance ($\alpha=0.05$) in the total study" 21st-century skills " due to the Year variable.
- There are statistically significant differences at the level of significance ($\alpha=0.05$) in the total study" 21st-century skills " due to the variable Age.

Table 11

the results of (scheffe) (Total scale “21st-century skills”) due to the variable Year

Year	Mean	First	Second	Third	Fourth and more
First	3.546	–	0.001	–	–
				0.136	0.21١
Second	3.544		–	–	–
				0.138	0.21٣*
Third	3.682			–	–
					0.075
Fourth and more	3.757				–

*** Differences are statistically significant at the level of significance ($\alpha=0.05$)**

Table 11 shows significant differences between " Second " and " Fourth and more ", in favor of the (Fourth and more) category.

To explore the places of significant difference between descriptive of total scale “21st-century skills” due to the variable Age, a post hoc test (scheffe) was applied; tables below show that.

Table 12

The degree to which female students of the College of Educational Sciences at Al al-Bayt University possess twenty-first century skills and their relationship to some variables Dr Alslaiti ,Dr Almeqdadi

the results of (scheffe) (Total scale "21st-century skills") due to the variable Age					
Age	Mean	19	20	21	22 and more
19	3.501	–	–	–	–
		0.245*	0.152		0.080
20	3.746		–	0.094	0.165
21	3.653			–	0.072
22 and more	3.581				–

* Differences are statistically significant at the level of significance ($\alpha=0.05$)

Table 12 shows significant differences between " 19 " and " 20 ", in favor of the (20) category.

Conclusion and Recommendations

This study investigated the level of 21st-century skills possessed by female students at the College of Educational Sciences (CES) at Al al-Bayt University. It also explored the influence of academic specialization, age, and academic year on these skills. The findings revealed that female students at the CES demonstrated a moderate level of proficiency in 21st-century skills on average. Importantly, no statistically significant differences were found in skill levels across

academic year, age, or most areas of specialization. This suggests a generally consistent level of 21st-century skills among female students in the CES program. Based on these findings, the study recommends that the CES curriculum should prioritize the development of 21st-century skills. This can be achieved through integrating relevant content, activities, and hands-on experiences throughout the program. Additionally, providing opportunities for practical application through field training and community service projects could further enhance skill development. Finally, ongoing assessment strategies are crucial to monitor progress and identify areas for improvement.

Based on the findings of this study, the following recommendations are proposed to strengthen the development of 21st-century skills among female students at the College of Educational Sciences (CES):

1. **Curricular Integration:** The CES curriculum should move beyond simply teaching 21st-century skills and actively cultivate their development. This can be achieved by incorporating relevant content, activities, and hands-on experiences throughout the program that specifically target these skills.
2. **Real-World Application:** Provide female students with opportunities to apply and refine their 21st-century skills in practical settings. This could involve incorporating field training placements and community service projects into the program.
3. **Faculty Development:** Offer CES faculty members adequate training on effective strategies for fostering 21st-century skills in their female students. This training could be delivered through workshops or professional development programs.
4. **Assessment Strategies:** Implement regular assessments of female students' 21st-century skills using a variety of metrics and tools. This will enable faculty to monitor progress and identify areas where further development is needed.

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