Deanship of Scientific Research

The Role of Jordanian Universities in Meeting the Requirements of Developing Students' Creative and Innovative Skills

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Abstract

Objectives: The research aims to elucidate the role of Jordanian universities in meeting students' requirements for the development of creative and innovative skills from their perspective.

Methods: The research employs a descriptive survey methodology to achieve its objectives. A research sample of (448) male and female students in the Islamic Education course was selected using the random sampling method during the first semester of the academic year (2022/2023). A questionnaire was designed to serve as the research tool, consisting of (48) items divided into four domains: personal requirements, academic requirements, administrative requirements, and technical requirements.

Results: The results indicate that the domain of administrative requirements occupies the first rank. Furthermore, the results reveal that the technical requirements domain comes in second place, while the academic requirements domain is ranked last. The results also show that the participants' responses to the questionnaire domains, as a whole, have a significant role with no statistically significant differences attributed to the variables of gender and academic degree. The results demonstrate statistically significant differences due to the university variable in favor of the responses of the "private" universities and the study program variable in favor of the "scientific" programs.

Conclusions: Given the said findings, the study has formulated several recommendations, the most important of which include: the development of creative and innovative skills among students and the promotion of a culture of creativity and innovation through integrating courses that stimulate creativity and utilizing creative activities in the curricula.

Keywords: Requirements, development, creative and innovative skills, Jordanian universities.

دور الجامعات الأردنية في تحقيق متطلبات تنمية القدرات الإبداعية والابتكارية لدى الطلبة

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ملخّص

الأهداف: يوضِح البحث دور الجامعات الأردنية في تلبية متطلبات تنمية المهارات الإبداعية والابتكارية لدى الطلاب ومن جهة نظرهم.

المنهجية: يستخدم منهج البحث الوصفي المسحي لتحقيق أهداف البحث؛ حيث جرى اختيار عينة بحث تتألف من (448) طالباً وطالبة في مقرر التربية الإسلامية باستخدام طريقة العينة العشوائية المتاحة خلال الفصل الدراسي الأول (2022/2023). كما صُمِّم استبيان كأداة بحث يتكون من (48) فقرة مقسمة إلى أربعة مجالات: المتطلبات الشخصية والمتطلبات الأكاديمية والمتطلبات الإدارية والمتطلبات الفنية.

النتائج: تشير النتائج إلى أن مجال إدارة المتطلبات الإدارية يحتل المرتبة الأولى. كما أظهرت النتائج أن مجال المتطلبات الفنية يأتي في المرتبة الثانية ، فيما يأتي مجال المتطلبات الأكاديمية في المرتبة الأخيرة. كما بينت النتائج أن متوسطات ردود المبحوثين على مجالات الاستبيان ككل لها دور كبير مع عدم وجود فروق ذات دلالة إحصائية تعزى لمتغير الجنس والدرجة الأكاديمية. وبينت النتائج وجود فروق ذات دلالة إحصائية تعزى لمتغير الجامعة لصالح استجابات الجامعات "الخاصة" ومتغير برنامج الدراسة لصالح البرامج "العلمية".

الخلاصة: بالنظر إلى النتائج المذكورة ، توصلت الدراسة إلى عدة توصيات أهمها: تنمية المهارات الإبداعية والابتكارية لدى الطلاب ونشر ثقافة الإبداع والابتكار من خلال دمج الدورات التي تحفز الإبداع وتوظيف الأنشطة الإبداعية في الخطط الدراسية.

الكلمات الدالة: المتطلبات، التنمية، المهارات الإبداعية والابتكارية، الجامعات الأردنية.

1. Introduction

Universities are distinguished educational institutions in higher education as they contribute to preparing future leaders in various domains of scientific and human knowledge and their various practical applications. They also strive for enriching and developing human thought, and use the latest discoveries and inventions of human creativity in terms of modern methods and technologies keeping pace with technical openness to achieve their current and future goals (Altarawneh & Hassan, 2022). Universities are an educational institution that keeps pace with the spirit of the times and anticipates the future, and is based on human knowledge and the scientific and technical progress in qualifying and preparing human cadres in various domains of knowledge, and works to offer innovative educational programs.

The role of universities is highlighted in providing students with practical skills and systematic scientific research mechanisms, training them to give and create creativity, and linking their knowledge and creative potential to community service, scientific and economic development, the life of the literary movements, and the cultural movement witnessed by the geographical environment of the university institution (Al-Zubaidi, 2008). Therefore, an urgent need is on the rise to encourage creative work by creating an appropriate organizational climate, identifying problems or factors that prevent this from being achieved, and then searching for solutions to overcome those factors or at least mitigate their effects (Al-Sumairi, 2003).

The creativity development process among university students is based on learning in which all components of the university participate and create a rich and diverse environment that is subject to careful administrative, academic, and technical supervision. The real role of universities lies in developing the spirit of creativity among the students of those universities that seek to achieve a prestigious global position and raise their students towards creativity that adapts to the changing world to release their creative energies and employ them efficiently (Al-Ansari & Kazem, 2008). The mission of universities to develop creativity among university students begins with addressing deficiencies, if any, in their systems and practices, working to enhance the efficiency of these systems, and activating their practices by meeting several basic requirements (Al-Azaibi, 2022).

Among these basic requirements are quality educational systems that raise the level of education quality and the development of measures that provide students with appropriate climates for balanced growth (Fish, 2007(. University leadership is represented in implementing and employing effective strategies for leadership practices to be creative in evaluating its departments, enhancing the characteristics of the internal environment, modernizing its organizational structures, correcting its procedures and policies, developing an organizational culture to ensure raising morale, job satisfaction and productivity, deepening affiliation and performing more than usual duties, increasing the effectiveness of work teams (Freud & Drach, 2009), and attaining achievement that provides the university with creativity and away from control and domination (Watson, 2009; Freud & Drach, 2009; Bryan & Wilson, 2014).

One of the requirements is a competent faculty that highlights the role of the university in taking care of its programs and developing plans, increasing the efficiency of education in it and the level of activity of its students and their interaction in building their knowledge and concepts, obtaining creativity and achieving innovative outcomes. Faculty members are required to set standards and procedures for their employment, continuously reveal their level of competence and competencies, draw up policies and plans to develop their skills, and provide regular opportunities to them, such as building a regional network of colleagues in the profession, building their professional portfolio, and presenting innovative practices designed to support various aspects of their professional development (Kettler, 2018).

Of these requirements is the process of continuous evaluation of the tasks and structure of centers and units for developing the performance of faculty members and the role of developers of this performance, keeping them connected to developments that increase the effectiveness of teaching, renewing their roles, mastering the use of creative methods, improving the efficiency of their students, and using methods that comply with international standards and principles to produce a group of brilliant thinkers (Schroeder, 2010; Billet & Henderson, 2011; Henry et al., 2013).

Administrative systems as a requirement are also characterized by effectiveness in managing and organizing educational affairs, and providing it with skills and modern technological means. As a result, leadership is the basis for the efficiency

of the main administrative operations and pushing the process of development and progress in the areas of its functions, facing challenges and sudden future changes, developing activities that meet the needs of programs, courses, and students, and activating the role of student clubs to provide their services in innovative scientific ways and methods, select supervisors from experts and specialists, and activate university counseling (Collins & Pieterse, 2007). With this introduction about universities as educational institutions in higher education leading to creativity among students, the related literature review is provided in the next part.

2. Literature Review

Numerous recent studies with varying objectives and instruments have recently focused on the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students. Al-Rabaa and Al-Omari (2022) identify the degree of availability of leadership requirements in Jordanian public universities in the light of contemporary global trends. The descriptive survey research approach is used to achieve the research approach. The questionnaire adopted as a research instrument is distributed to (249) academic leaders from the deans and heads of departments in the Jordanian public universities, i.e. "The University of Jordan, The Hashemite University, Yarmouk University, and Mutah University". The results show that the availability of entrepreneurship requirements in Jordanian public universities in the light of contemporary global trends is of a medium degree. The results also indicate statistically significant differences among the means of the respondents' responses on all areas of comparison for the degree of availability of leadership requirements in Jordanian public universities in the light of contemporary global trends with specializations "medical, scientific, educational, and literary" on the one hand. On the other hand, it is noted that the means of the responses of people with engineering specializations are due to the specialization variable in favor of the responses of people with engineering specializations. The study recommends making more conscious efforts and creative activities to develop the requirements of leadership in Jordanian public universities and activating cooperation among universities in scientific and academic experiences with the aim of continuous development and improvement in the requirements of university leadership.

Likewise, Al-Ofishat, Al-Salibi, and Al-Zboun (2019) pinpoint the role of Jordanian universities in developing creativity among their students through smart learning styles. The descriptive survey research approach is used to achieve the research approach. The study sample consists of (538) male and female undergraduate students in public and private Jordanian universities for the academic year (2017/2018). The questionnaire is used as a study instrument. The results show that the role of Jordanian universities in developing creativity among their students through smart learning styles is of a medium degree. The results indicate statistically significant differences due to gender in favor of females, differences due to the faculty variable in favor of scientific colleges, and differences due to the university type variable in favor of private universities.

On a parallel line, Mohammad (2019) develops creative teaching skills among students of the Faculty of Education at the Biology Division using Marzano's Dimensions of Learning model. To achieve the study objectives, a list of creative teaching skills, a note card for creative teaching skills in the basic stages of teaching "planning, implementation, evaluation", a test in the cognitive aspect of those skills, and a student-teacher book and a teacher-studen's guide are prepared according to Marzano's Dimensions of Learning model. A semi-experimental approach with two groups: control and experimental is also used. The instruments are applied to the research sample consisting of (30) male and female students from the second year at the Biology Division at Menoufia University for the academic year 2018/2019, as an experimental group studying according to Marzano's Dimensions of Learning model, and (30) male and female students as a control group studying in the traditional approach. The findings indicate statistically significant differences at the significance level of (0.05) between the means of the scores of students of the control and experimental groups in the post-application of the Creative Teaching Skills Card as a whole and its sub–components; teaching fluency, teaching flexibility, teaching originality and sensitivity to teaching problems in favor of the scores of students of the experimental group. The results show statistically indicative differences at the significance level of (0.05) between the means of the scores of students of the control and experimental groups in the post-application to test the cognitive aspect of creative teaching skills as a

whole and its sub-components: teaching fluency, teaching flexibility, teaching originality and sensitivity to teaching problems in favor of the scores of the experimental group students.

In the same context, Ullet, Willerson, Lamb, and Kettler (2018) investigate teachers' perceptions of creativity and characteristics associated with creative students. The study sample consists of (371) teachers in the United States of America. The student's characteristics are classified on a Desirability Scale to the Undesirability Scale. The participating teachers are also asked to self-evaluate personal creativity and arrange a set of educational goals based on what they consider the most important. The findings indicate that teachers have found student characteristics related to undesired creativity from those characteristics that do not distinguish creativity. The results show that the level of creativity of personal teachers is related to the extent of their desire to assess the characteristics of the student associated with creativity. However, the significance used by teachers to classify creative thinking has a small effect on the extent of their desire to find the characteristics associated with student (Alsalti, Alkhateeb, & Abu Ali, 2021)

Moreover, Kettler, Lamb, Willerson, and Mullet (2016) explore teachers' perceptions about creativity to achieve a deeper understanding of how to activate classroom environments rich in creative thinking in Texas State in the USA. The study sample consists of (520) quantitative and experimental research studies together with the samples of teachers from kindergarten to the twelfth grade during service. The findings show that although teachers appreciate creativity, their concepts of creativity are not supported by theory and research on creativity. The results show that teachers feel unable to enhance or identify creativity in their classroom, as they are equal to creativity with the arts, along with the impact of personal and cultural beliefs in their perceptions of creativity and creative students. The brief literature review of the various readings and interpretations of attitudes toward factors that contribute to developing creativity among faculty members in universities and students evinces that there shall be a close focus on issues of developing creativity and innovation among youth (Yosef, 2023). The current study is in line with previous studies in employing the creativity skills of university students, as the researchers have benefited from these studies in preparing the research instrument, theoretical framework, and research procedures. Given the previous review of the related studies, the research problem is given next.

3. Research Problem

The research problem is reflected in the need to identify the factors that contribute to the development of creativity skills among university students, which constitute excellence in the practice of managing and developing the spirit of creativity due to the presence of creative leaders and departments in their policies and departments, employing available resources to adapt and conform to technical and technological developments and developments with modern knowledge, and preparing opportunities to nurture its students and promote a university life that is in line with their creative circumstances.

Creative leaders and administrations seek to employ their mental abilities and creative energies, enable them to be able to plan and achieve self-efficacy related to adaptation, academic performance and personal achievements, encourage faculty members to conduct research that contributes to the development of creativity skills for students, and reveal their thinking patterns, learning style and creative abilities. This is what Al-Mandhari's study (2013) supports, calling for focusing on creative education and improving their creative abilities. This is also stated by (Bakhit & Issa, 2013), which urges examining the deficiencies in the role of universities in developing creativity among students and the low level of creativity among students due to the lack of many university courses in the criteria necessary to select honesty, realism, functional knowledge, and their association with problems and addressing contemporary issues for individuals.

Other studies, on the other hand, indicate that the university curriculum focuses on the cognitive side, neglecting the emotional and field aspects, and the lack of variety in activities, as they are just courses that students must memorize and memorize to pass the exam only (Gharaibeh, 2009). Some studies also focus on traditional educational methods that work to provide students with the largest possible number of information and facts without the use of research, exploration, data collection and analysis, and thus work to eliminate mental skills that lead to deficiencies in the development of creativity (Freej & Shehab, 2012). With the reserachers' belief of the nessccity to conduct this research, the research problem lies in recognizing the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students from their perspective. Given the said research problem, the research questions are presented in the following section.

4. Research Questions

Given the research problem, the research questions are:

1. What is the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students' points of view?

2. Are there statistically significant differences ($\alpha \leq 0.05$) among the respondent's responses to the role of Jordanian universities in meeting the requirements of developing students' creative and innovative skills due to the different variables of gender, university type, study program, and academic degree?

5. Research Objectives

The following objectives are articulated to answer the research questions.

1. Identify the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students from their point of view.

2. Find out whether there are statistically significant differences ($\alpha \leq 0.05$) among the respondent's responses to the role of Jordanian universities in meeting the requirements of developing students' creative and innovative skills due to the different variables of gender, university type, study program, and academic degree.

6. Research Significance

The significance of the research is reflected in demonstrating the significance of the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students. The theoretical significance of the reserach also lies in contributing to the review of literary studies in the subjects of study in aspects of the requirements of the culture of creativity and innovation among university students, benefiting from the wide range of students' knowledge of the importance of spreading the culture of creativity among students, and its role in improving the level of communication between them and faculty members, and directing faculties to develop course plans by including the requirements for developing the creative and innovative abilities of students studying in various scientific and human disciplines.

The current research also presents the importance of employing activities that have a positive impact on the development of creative and innovative abilities to add vitality while teaching courses. Besides, the study shows an attempt to monitor the strengths in the role of the University of Jordan in developing students' creativity to enhance them, and at the same time reveal potential opportunities to seize and take them. The study demonstrates an attempt to monitor potential threats in order to avoid and reduce them, or to make the necessary modifications to them. to benefit from it. Moreover, the current study deals with an important topic, which is the development of creativity, which is one of the most central educational goals that societies seek to achieve, as creative individuals play an important and active role in the development of their societies in all educational, social, artistic and technical fields. Furthermore, the current research is concerned with is concerned with the key category of students at the university level, as it bears the role of leadership in the future, and thus constitutes a national wealth for societies that must be preserved.

7. Research Limitations

The findings of this research can be generalized in light of the following limitations:

1. Human Limitations: This research is limited to a sample of male and female students studying in Jordanian universities in the Hashemite Kingdom of Jordan.

2. Spatial Limitations: This research is conducted in Jordanian universities in the Hashemite Kingdom of Jordan

3. Temporal Limitations: This research is applied during the first semester of the academic year (2022/2023).

4. Objective Limitations: The generalization of the findings of the current research is determined by its research population, the degree of seventh-grade students' response, and the nature of its instrument. The research findings are limited to the validity and reliability of the used study instrument by preparing a questionnaire consisting of (48) items distributed over four areas: personal requirements, academic requirements, administrative requirements, and technical requirements.

8. Research Terms and Definitions

In this study, several terms are mentioned, and their procedural definitions are as follows:

Role: It is a set of functions, tasks, and responsibilities carried out by Jordanian universities, represented by the

university and faculty administration, faculty members, the curriculum, and the university environment to achieve educational goals within the university that help in developing the creative and innovative skills of students.

Creative Skill: It is a perceptual activity that results in a new or unfamiliar way of seeing a problem or finding a solution to a problem. It is determined by the student's score on the scale designed to conduct the study.

Creativity: It is a person's ability to use mental skills to come up with new and innovative ideas that are out of the ordinary. Also, creativity is not a genetic behavior, but a behavior that can be learned and developed by individuals. It is also the skill of finding ideas and solutions to problems, provided that they are rare and unique ideas of their kind (Strom, 2002).

Innovation: It is a dynamic mental process that requires innovative thinking to be one of its inputs to develop new ideas or create new uses for existing products with the emphasis that innovation must be something better or the successful exploitation of new ideas (Okpara, 2007). Procedurally, it is the process that results in presenting a new idea, service, or product that is useful to people. It is a practical ability to generate and implement new creative ideas as a result of the interaction of a set of systems and processes to produce an idea, service, or method that does not previously exist, or a major development of it without imitation to achieve public benefit to society.

University: It is an educational institution affiliated with higher education. It is a research center, civilizational link, and cultural and intellectual beacon, with a dynamic moving system, and human society to which the rules of social interaction apply. It seeks to develop the creative skills of its students due to its significance in preparing scholars and creative thinkers.

9. Method

This section comprises a description of the research population and sample, the research instrument, methods of checking its validity and reliability, the research variables, and the statistical processing used to attain the results.

Research Approach

Given the research questions and objectives, the descriptive survey research approach is selected by surveying, collecting, and analyzing the data of the research problem using the questionnaire applied to students in Jordanian public and private universities.

Research Population

The research population includes all (322349) male and female students in Jordanian public and private universities. They are distributed among (27) universities, including (10) public universities, and (17) private universities, according to the statistics of the Ministry of Higher Education and Scientific Research (MHESR) for the academic year (2022/2023).

Research Sample

A research sample of (448) male and female students in the Islamic Education Course is selected from the research population by the available random sampling method during the first semester (2022/2023). They constitute approximately (0.14%) of the research population. Table (1) shows the distribution of the sample members according to their variables.

Table 1: Distribution of the Research Sample According to its Variables

Variables	Levels	Frequency	Percentage
Gender	Male	203	45.31%
	Female	245	54.69%
Univervity Type	Public	313	69.87%
	Private	135	30.13%
Faculty	Scientific	347	77.46%
	Humanaties	101	22.54%
Academic Degree	Bachelore	327	72.99%
	Graduate	121	27.01%
Total		448	100.00%

Research Instrument

Selected previous studies relating to the research problem (Bakhit & Issa, 2013) are used to design a questionnaire as a research instrument. In its final form, the questionnaire consists of (48) items distributed in four areas, namely: personal requirements, academic requirements, administrative requirements, and technical requirements.

Research Instrument (Questionnaire) Correction

To answer the research questions, the following statistical methods of means and standard deviations of individual responses to each item of the research instrument. To evaluate the role of Jordanian universities in meeting the requirements of developing creative and innovative skills among students from their perspectives, the degree of the role is classified into five levels using a 3-point scale similar to the 3-point Likert scale (High, Medium, & Low) by calculating the mean; using the following statistical scale to distribute the means (Odeh, 2007).

The Mean ranging between (1) and (2.49) indicates a Low Degree of Approval, the Mean ranging between (2.50) and (3.49) indicates a Medium Degree of Approval, and the Mean ranging between (3.50 - 5) indicates a High Degree of Approval.

Research Instrument Validity

To check the validity of the questionnaire, it is evaluated by a committee of (11) validators with specialization and experience from faculty members in Jordanian universities to take their suggestions on the accuracy of each item and the degree of its suitability for the related domain, in addition to proposing appropriate additions or amendments. Based on the remarks of the validators, some items and linguistic wordings are modified, and thus the total number of items of the research instrument as a whole in its final form is (48) items distributed into the four domains.

Research Instrument Reliability

The reliability coefficients are calculated in two methods to check the reliability of the questionnaire. The first method includes the application and re-application, as it is applied twice on an exploratory sample of (33) male and female students from outside the research sample, with a two-week interval between the first application and the second application. Pearson correlation coefficients between the results of the two applications are calculated. The values of reliability coefficients for the domains have ranged between (0.80) and (0.87), and the value of the correlation coefficient for the total questionnaire is (0.91). The second method, however, includes the use of the Cronbach alpha equation for the consistency of the items. The values of the reliability coefficients for the domains have ranged between (0.81) and (0.90), and (0.93) for the total questionnaire, which are acceptable values for conducting such research.

Research Variables

The study includes the following variables:

1. Intermediate Variables:

Gender: It has two categories: (Male and Female).

University: It has two categories: (Public Universities and Private Universities).

Faculty: It has two categories: (Humanities Faculties and Scientific Faculties).

Academic Degree: It has two levels: (Undergraduate and Graduate).

2. Dependent Variable: It is the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students from their point of view represented by the means of the research sample's responses on the items of the questionnaire domains prepared for that.

Statistical Processing

The means and standard deviations are used to answer the first question, while multivariate analysis of variance (MANOVA) and quartile analysis of variance are also used to answer the second question.

10. Results & Discussion

The data is collected and analyzed by using a questionnaire on the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students from their point of view. Those results are

presented according to the research questions.

First: Results related to the First Research Question

What is the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of studentst' points of view?

To answer this question, the means and standard deviations of individual responses to the items related to the four domains of the research instrument of the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students are calculated. Table (2) illustrates those results.

Table 2: The Means and Standard Deviations of Individual Responses to the Items Related to the Four Domains of the Research Instrument of the Role of Jordanian Universities in Meeting the Requirements of Developing the Creative and Innovative Skills of Students Arranged in Descending Order.

No.	Domains	Means*	Standrad Deviations	Degree of Approval
3	**Administrative Requirements**	3.86	0.45	**High**
4	**Technical Requirements**	3.84	0.51	High
1	**Personal Requirements**	3.64	0.59	High
2	**Academic Requirements**	3.61	0.41	High
	All Instrument Items	3.72	0.38	High

The high degree is out of (5).

As shown in Table (2), the domain of administrative requirements is ranked first with a mean (3.86) and a standard deviation (0.45), while the domain of technical requirements is ranked second with a mean (3.84) and a standard deviation (0.51). The domain of academic requirements is ranked last, with a mean of (3.61) and a standard deviation of (0.41), whereas the mean of the research sample's responses on all questionnaire domains is (3.72) with a standard deviation of(0.38), which corresponds to a high degree.

This result may be because the university administration is the one who plays the role of guidance and follow-up in preparing plans for faculties and departments to raise the capacity of students in various scientific and humanities disciplines, selecting teachers with expertise and knowledge who are distinguished in their performance and who have won internal and external awards due to their dedication to their work, and encouraging them to hold courses in teaching thinking, research and writing to take into account the needs of their students and prepare them to explore the future. Technical requirements, however, are ranked second for the role of the university in providing all social networks and creative clubs, which contribute to accessing knowledge and digital information resources and provide an educational environment based on modern technologies.

On the other hand, the academic requirements are ranked last because the university seeks to assign faculty members to prepare plans for courses and renew them in line with scientific, technical, and cultural development and contain goals characterized by creativity and innovation to enable students to employ problem-solving skills, develop the ability to think creatively and provide feedback on creative and innovative skills they have acquired. The results of this question agree with the results of the study (Mullet, Willerson, Lamb, & Kettler, 2018) and differ from the results of the study (Kettler, Lamb, Willerson, & Mullet, 2016). The means and standard deviations of the responses of the research sample on the items of the questionnaire domains are calculated as follows:

First Domain: Personal Requirements

Table 3: The Means and Standard Deviations of Individual Responses to the Items Related to the Personal Requirements Arranged in Descending Order.

No.	Text of Item	Mean*	Standrad Deviation	Degree of Role
9	The university encourages its students to learn individually.	3.94	0.74	High
8	The university presents time management models from the lives of scientists and innovators.	3.93	0.75	High
12	The university encourages its students to employ purposeful imagination in facing problems and issues.	3.91	0.79	High
10	The university develops critical thinking skills among its students: conclusion. Interpretation, reasoning and evaluation.	3.90	0.75	High
11	The university enables its students to interact with modern environmental and educational changes.	3.74	0.87	High
1	The university motivates students to be creative and innovative.	3.70	0.82	High
7	The university encourages its students to appreciate the value of time.	3.64	0.91	High
2	The university develops students' responsibility towards the renaissance of the homeland and the Islamic nation.	3.60	0.83	High
3	The university develops achievement motivation among students.	3.50	0.90	Medium
5	The university encourages its students to take the initiative in asking questions.	3.45	0.99	Medium
13	The university helps its students employ reflective thinking to solve problems.	3.40	0.92	Medium
4	The university develops the skill of positive thinking among students.	3.35	0.97	Medium
6	The university works on employing scientific programs to develop curiosity among its students	3.29	0.98	High
All Domain Items		3.64	0.59	High

The high degree is out of (5).

As shown in Table (3), item (9) stipulating "the university encourages its students to learn individually" is ranked first with a mean (3.94) and a standard deviation (0.74), while item (8) stipulating "the university presents time management models from the lives of scientists and innovators" is ranked second with a mean (3.93) and a standard deviation (0.75). Item (6) stipulating "the university works on employing scientific programs to develop curiosity among its students" is ranked last with a mean (3.29) and a standard deviation (0.98), where the mean of the research's responses on all questionnaire domains is (3.64), and standard a deviation of (3.64) and a standard deviation (0.59), which corresponds to a high degree of the role.

Second Domain: Academic Requirements

Table 4: The Means and Standard Deviations of Individual Responses to the Items Related to the Academic Requirements Arranged in Descending Order.

No.	Text of Item	Mean*	Standrad Deviation	Degree of Role
17	Incorporating objectives into the curricula that seek to develop the creative and innovative skills of students.	3.92	0.68	High
18	The courses promote the values of creativity and innovation among students.	3.85	0.76	High
27	The faculty member encourages the presentation of creative ideas by his students.	3.82	0.63	High
20	Modern methods of teaching are used to contribute to developing creative and innovative abilities.	3.79	0.71	High
26	The faculty member encourages his students to engage in dialogue.	3.78	0.56	High
19	The courses employ problem-solving skills.	3.76	0.75	High
25	The faculty member takes care of differentiated learning.	3.72	0.61	High
16	Enabling the courses to develop the ability to think creatively.	3.68	0.72	High
15	Provide the academic curricula of stufents with life experiences and attitudes in developing their creative and innovative abilities.	3.65	0.81	High
24	The faculty member adopts a culture of creativity and innovation.	3.62	0.69	High
21	The university participates in evaluating students' performance.	3.50	0.73	High
14	Relating the course objectives to the nation's need for creators and innovators.	3.40	0.90	Medium
23	The university directs the faculty member to employ creative strategies to solve problems.	3.31	0.95	Medium
22	Students are given immediate feedback on the results of the assessment.	2.78	1.09	Medium
All Domain Items		3.61	0.41	High

The high degree is out of (5).

As shown in Table (4), item (17) stipulating "incorporating objectives into the curricula that seek to develop the creative and innovative skills of students." is ranked first with a mean (3.92) and a standard deviation (0.68), while item (18) stipulating "the courses promote the values of creativity and innovation among students" is ranked second with a mean (3.58) and a standard deviation (0.76). However, item (22) stipulating "students are given immediate feedback on the results of the assessment." is ranked last with a mean (2.78) and a standard deviation (1.09), where the mean of the research's responses on all questionnaire domains is (3.61) and a standard deviation (0.41), which corresponds to a high degree of the role.

Third Domain: Administrative Requirements

Table 5: The Means and Standard Deviations of Individual Responses to the Items Related to the Administrative Requirements Arranged in Descending Order.

No.	Text of Item	Mean*	Standrad Deviation	Degree of Role
35	The university is keen to determine the ratio of the number of students to each faculty member.	3.98	0.70	High
34	The university seeks to constantly modernize the structure of the administrative system.	3.95	0.67	High
36	The university administration allocates open meetings for interaction between students and university departments.	3.94	0.62	High
37	The university is keen to activate the role of activities that develop the creative and innovative abilities of students.	3.93	0.61	High
33	The university attracts scientific expertise that contributes to developing their creative and innovative abilities.	3.92	0.68	High
32	The university builds training programs for its students in creative thinking.	3.90	0.63	High
38	The university works to modify organizational activities to develop creative and innovative skills.	3.87	0.64	High
39	The university is keen to protect intellectual property rights and patents.	3.80	0.81	High
31	The university seeks to involve its students in the educational process	3.78	0.73	High
29	It encourages the industrial sector and entrepreneurs to benefit from the creative and innovative skills of its students.	3.76	0.70	High
30	The university is interested in foreseeing and predicting the future.	3.74	0.72	High
28	The university is keen to update its philosophy in line with the requirements of the times.	3.73	0.77	High
All Domain Items		3.86	0.45	High

The high degree is out of (5).

As shown in Table (5), item (35) stipulating "the university is keen to determine the ratio of the number of students to each faculty member" is ranked first with a mean (3.98) and a standard deviation (0.70), while item (34) stipulating "the university seeks to constantly modernize the structure of the administrative system" is ranked second with a mean (3.95) and a standard deviation (0.67). However, item (28) stipulating "the university is keen to update its philosophy in line with the requirements of the times" is ranked last with a mean (3.73) and a standard deviation (0.77), where the mean of the research's responses on all questionnaire domains is (3.86), and a standard deviation (0.45), which corresponds to a high degree of the role.

Fourth Domain: Technical Requirements

Table 6: The Means and Standard Deviations of Individual Responses to the Items Related to the Technical Requirements Arranged in Descending Order.

No.	Text of Item	Mean*	Standrad Deviation	Degree of Role
42	The university provides digital knowledge and information resources.	3.98	0.66	High
44	The university uses social media to activate the educational process.	3.95	0.62	High
48	The university is keen to support scientific and technological clubs.	3.94	0.68	High
43	The university provides internet networks for all faculties and tributary facilities in the university.	3.93	0.62	High
45	The university employs artificial intelligence to facilitate communication processes.	3.91	0.65	High
46	The university seeks to establish a center or institute for creativity and innovation.	3.84	0.74	High
40	The university provides new tools and devices for education and interaction.	3.83	0.82	High
47	The university provides virtual scientific laboratories.	3.66	0.89	High
41	The university seeks to provide an advanced educational environment based on modern technologies.	3.55	1.03	High
All Domain Items		3.84	0.51	High

The high degree is out of (5).

As shown in Table (6), item (42) stipulating "the university provides digital knowledge and information resources" is ranked first with a mean (3.98) and a standard deviation (0.66), while item (44) stipulating "the university uses social media to activate the educational process" is ranked second with a mean (3.95) and a standard deviation (0.62). However, item (41) stipulating "the university seeks to provide an advanced educational environment based on modern technologies." is ranked last with a mean (3.55) and a standard deviation (1.03), where the mean of the research's responses on all questionnaire domains is (3.84), and a standard deviation (0.51), which corresponds to a high degree of the role.

Second: Results related to the Second Research Question

2. Are there statistically significant differences ($\alpha \leq 0.05$) among the respondent's responses to the role of Jordanian universities in meeting the requirements of developing students' creative and innovative skills due to the different variables of gender, university type, study program, and academic degree?

To answer this question, the means and standard deviations of individual responses to the items related to the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students according to the variables of gender, university type, study program, and academic degree on the questionnaire domains, and all questionnaire items. Table (7) illustrates those results.

Table 7: The Means and Standard Deviations of Individual Responses to the Items Related to the Role of Jordanian Universities in Meeting the Requirements of Developing the Creative and Innovative Skills of Students According to the Variables of Gender, University Type, Study Program, and Academic Degree.

Variables	Levels	No.	Personal Requirements		Administrative Requirements		Academic Requirements		Technical Requirements		All Questionnaire Items	
			AM	SD	AM	SD	AM	SD	AM	SD	AM	SD
Gender	Male	203	3.61	.809	3.61	.645	3.85	.682	3.87	.702	3.72	.600
	Female	245	3.67	.789	3.62	.601	3.86	.639	3.82	.746	3.73	.583
University Type	Public	313	3.32	.793	3.32	.630	3.53	.647	3.51	.708	3.53	.585
	Provate	135	3.79	.809	3.71	.601	3.98	.684	3.99	.767	3.86	.604
Study Program	Scientific	347	3.44	.757	3.46	.583	3.50	.628	3.57	.689	3.49	.555
	Humanities	101	3.79	.914	3.73	.725	3.89	.756	3.94	.845	3.83	.693
Academic Degree	Bachelore	327	3.66	.797	3.63	.603	3.88	.641	3.88	.707	3.75	.579
	Graduate	121	3.59	.799	3.57	.668	3.80	.700	3.75	.770	3.66	.618

Table (7) shows apparent differences between the means of the responses of the research sample on the domains of the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students according to the variables of gender, university type, study program, and academic degree on the questionnaire domains. To find out the levels of statistical significance of these differences, multivariate analysis of variance (MANOVA) is used as illustrated in Table (8).

Table 8: Results of the Multivariate Analysis of Variance (MANOVA) of the Differences between the Means of Individual Responses on the Domains of the Role of Jordanian Universities in Meeting the Requirements of Developing the Creative and Innovative Skills of Students According to the Research Variables.

Source of Variance	Domains	Sums of Squares	Degrees of Freedom	Mean Squares	F-Value	Statistical Significance
Gender Hotelling Value = 0.238 H = 0.461	Personal Requirements	.644	1	.644	1.017	.314
	Academic Requirements	.038	1	.038	.100	.752
	Administrative Requirements	.009	1	.009	.021	.884
	Technical Requiremnets	.297	1	.297	.563	.453
University Type Hotelling Value = 0.928 H = 0.002	Personal Requirements	6.338	1	6.338	10.013	.001*
	Academic Requirements	5.074	1	5.074	13.214	.001*
	Administrative Requirements	5.952	1	5.952	13.683	.001*
	Technical Requiremnets	6.554	1	6.554	12.413	.001*
Study Program Hotelling Value = 0.942 H = 0.001	Personal Requirements	5.659	1	5.659	8.940	.007*
	Academic Requirements	6.488	1	6.488	16.896	.001*
	Administrative Requirements	6.072	1	6.072	13.959	.001*
	Technical Requiremnets	5.894	1	5.894	11.163	.001*
Academic Degree Hotelling Value = 0.217 H = 0.483	Personal Requirements	0.286	1	0.286	0.452	.502
	Academic Requirements	0.161	1	0.161	0.419	.518
	Administrative Requirements	0.594	1	0.594	1.366	.244
	Technical Requiremnets	1.372	1	1.372	2.598	.108

Source of Variance	Domains	Sums of Squares	Degrees of Freedom	Mean Squares	F-Value	Statistical Significance
Error	Personal Requirements	280.419	1	0.633		
	Academic Requirements	170.112	1	0.384		
	Administrative Requirements	192.705	1	0.435		
	Technical Requiremnets	233.904	1	0.528		

- **Statistically significant at the significance level (α≤0.05).**

Table (8) shows no statistically significant differences between the means of the responses of the research sample in all domains of the research due to the gender variable. Besides, it is found that there are statistically significant differences between the means of the responses of the research sample in all domains of research due to the university-type variable in favor of the responses of the private universities. The table also indicates statistically significant differences in the means of the responses of the research sample in all domains of the research due to the study program variable in favor of the responses of the scientific disciplines. Moreover, there are no statistically significant differences between the means of the responses of the research sample in all domains of the research due to the academic degree variable. A quadruple analysis of variance test is also conducted for the differences among the respondents' responses on the domains of the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students as a whole according to the variables of gender, university type, study program, and academic degree. The results are illustrated in Table (9).

Table 9: Analysis Test of the Quadruple Analysis of Variance of the Differences between the Individual Responses on the Domains of the Role of Jordanian Universities in Meeting the Requirements of Developing the Creative and Innovative Skills of Students as a Whole According to the Variables of Gender, University Type, Study Program, and Academic Degree

Variables	Sums of Squares	Degrees of Freedom	Mean Squares	F-Value	Statistical Significance
Gender	.039	1	.039	.111	.739
University Type	3.124	1	3.124	8.977	.006*
Study Program	4.221	1	4.221	12.129	.001*
Academic Degree	0.454	1	0.454	1.305	.254
Error	154.164	443	0.348		
Total	6370.655	447			

- **Statistically significant at the significance level (α≤0.05).**

Table (9) demonstrates no statistically significant differences between the means of the respondents' responses on the domains of the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students as a whole due to the variables of gender and academic degree. However, there are statistically significant differences between the means of the respondents' responses on the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students as a whole due to the university-type variable in favor of private universities' responses, and the study program variable in favor of scientific disciplines.

Importantly, this result may be because the university seeks to attract specialists with distinguished expertise by preparing competitions and preferential tests among male and female faculty members without focusing on academic degrees professor, associate professor, and assistant professor, as they are selected for their competence, skills, and distinguished and diverse theoretical and practical research, which enables them to develop the creative and innovative

capabilities and skills of students. Yet, the statistical differences of the university type variable are in favor of the responses of private universities, since private universities seek to maintain their reputation and graduate a distinguished quality of students competing in obtaining the best opportunities in the local and global market. Moreover, the results are in favor of the scientific majors, as they take care of the scientific, medical, and engineering contributions at the global level to link these colleges globally to match the scientific and technological development.

On a parallel line, scientific disciplines always seek to occupy the first positions in scientific research and achieve achievements, innovations, and advanced knowledge industries that contribute to preserving the human race, offering creative solutions towards the risks facing the world such as the spread of viruses and various types of bacteria harmful to the human element that cause incurable and deadly diseases, and providing advice to taking care environment and minimizing the huge losses that affect all countries of the world financially, materially, and morally. The results of the second question agree with the results of Mohammad's study (2019) and differ from the results of the study (Al-Afishat, Al-Saliby, & Al-Zboun, 2019).

11. Conclusion

In a nutshell, this article identifies the role of Jordanian universities in meeting the requirements of developing the creative and innovative skills of students from their perspective. The findings indicate that the domain of management of administrative requirements is ranked first. The results also show that the domain of technical requirements is ranked second, while the domain of academic requirements is ranked last. The findings show that the means of the respondents' responses on the questionnaire domains as a whole are of a high role with no statistically significant differences due to the variables of gender and academic degree. The results demonstrate statistically significant differences due to the university variable in favor of the responses of the "private" universities, and the study program variable in favor of the "scientific" programs.

12. Recommendations

Given the aforesaid results, the research recommends developing plans for scientific and humanities faculties and adding courses that are in harmony with modern life developments, following up on the evaluation of programs and faculty members to strengthen the personality of the students and develop their creativity, reconsidering the appropriate educational and learning environment that promotes creativity in Jordanian universities to provide a healthy university environment that enhances creativity, and paying attention to the students and considering their positive roles in all the requirements and assignments, and involving them in all the educational activities that universities hold inside and outside the university environment.

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