International Journal of Innovative Research and Scientific Studies, 8(1) 2025, pages: 394-406

IJIRSS
International Journal of Innovative Research & Scientific Studies

ISSN: 2617-6548

URL: www.ijirss.com

Computerized exams use in enhancing the credibility of the education system

Hamzeh Alassaf

Classroom Teacher Department, Faculty of Arts, Al-Zaytoonah University of Jordan, Jordan.

(*Email: H.alassaf@zuj.edu.jo*)

Abstract

This paper aims to identify the role of computerized exams in enhancing the credibility of the education system from Al-Zaytoonah University of Jordan students' perspectives. The research methodology uses descriptive survey research. The research also includes designing a 28-item questionnaire as a research instrument distributed over three areas and an interview form used to conduct interviews with 53 students included in the research population. The findings indicate that computerized exams have high trust and credibility among university students and receive high acceptance and preference. The results indicate statistically significant differences at a level of less than 0.05 for the overall variables depending on the gender variable in favor of males with a t-value of 4.01 and a significance level of 0.00. The article concludes by supporting the expansion of computerized exams especially those that show the results immediately in assessing students' academic performance and achievement as it provides a sense of confidence in the integrity and transparency of the test and enhances the credibility of the educational system. Another recommendation is developing modern and more effective software and computerized exam methods capable of measuring the largest possible number of skills and knowledge to encourage students and teachers to move toward this type of test.

Keywords: Computerized, Credibility, Educational, Exam, System, University.

DOI: 10.53894/ijirss.v8i1.4172
Funding: This study received no specific financial support.
History: Received: 27 May 2024/**Revised:** 29 November 2024/**Accepted:** 20 December 2024/**Published:** 17 January 2025

Competing Interests: The author declares that there are no conflicts of interests regarding the publication of this paper.
Transparency: The author confirms that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.
Institutional Review Board Statement: The Ethical Committee of the Al-Zaytoonah University of Jordan, Jordan has granted approval for this study on 12 December 2023 (Ref. No. 08/11/2023/2024).
Publisher: Innovative Research Publishing

1. Introduction

Education is one of the most key pillars that help people's progress and development. One of the most important features of any effective educational system is transparency, credibility and fairness in evaluating the education-based process. Exams gain special importance in the educational process as the evaluation of the outcomes of the educational process depends on them. However, traditional exams may lead to problems especially questioning the validity, credibility and fairness of the evaluation results as questions may leak while being printed or stored before being distributed in the exam halls [1].

However, the personal attitudes and relationships of the assessors, their mood and psychological state or any other factors related to them may affect the results of the evaluation negatively or positively. As a result, this often leads to students and their parents complaining about these exams and claiming injustice or the assessor's bias and favoritism towards other students or receiving personal benefits in exchange for interfering in the results of the correction in favor of this or that party [2]. This may reflect negatively not only on the reputation and credibility of the educational institution but also on the trust of the learner and society as a whole in the educational system and educational outcomes at the national level which goes beyond the borders of the country to affect its reputation and academic credibility at the regional and international levels [3].

One of the most important aspects of the use of modern technology in education is the rise of modern methods for evaluating students. The use of technology in lessons has become widespread as increasing interest has emerged in recent years in developing and using computerized exams in the education process especially in educational evaluation instead of traditional paper-and-pencil exams. This interest has increased in recent years for several reasons including that traditional evaluation method in crowded classrooms may constitute a large burden on teachers. Integrating modern technologies into evaluation processes supports the professional development of teachers. There are also studies demonstrating that students achieve better achievements in computerized exams [4, 5].

The use of modern technologies in the teaching process usually stops before the evaluation process as if evaluation is not considered part of the education-based process [6]. Rather, modern technologies can contribute effectively to the development of assessment as it is not logical for teachers to seek to discover modern computerized strategies in education while clinging to teaching methods for evaluating the outcomes of that education [7]. The use of modern technological means in computerized exams aims to evaluate students objectively as appropriate evaluation is considered one of the main elements of the effective learning process. The following are the two main types of assessment: formative assessment and summative assessment where summative assessment is concerned with the students' ability to achieve the expected learning outcomes at the end of their learning of a course on the one hand. On the other hand, formative assessment is concerned with the process of continuous feedback during the learning process given to students. These two assessment methods can be used in computerized exams [8].

Computerized assessment plays a key role in the shift to a learner-centered approach to more accurately assess student performance as it helps develop a deeper understanding of what the learner knows. The online evaluation is characterized by enabling teachers to test their students better which contributes to reducing the teacher's burden and saving the financial cost, time and effort spent on preparation, monitoring, supervision, correction and preparing reports [2]. The result of each student can be shown more quickly through computerized assessment [9].

Computerized exams help many teachers in the university education stage use them as an alternative to traditional exams for several reasons, including the large number of students in one course, the need to place students in similar conditions during the test and the absence of the need for proctors in the realistic sense that occurs during the traditional exam, reducing fraud that may occur during the test, ensuring integrity and objectivity in the evaluation process, eliminating the many difficulties associated with traditional exams such as the effort and time required to prepare and correct test papers and the lack of objectivity among some teachers during evaluation [10].

Computerized exams carry some weaknesses such as the possibility of some students especially those with low performance, resorting to guessing and relying on luck in answering test questions in addition to the infrastructure, programs, and equipment that these exams require [8]. Computerized assessment now represents a fundamental pillar and an important aspect of any modern educational system as the success of these systems depends greatly on the quality and accuracy of their assessment [11]. Great technical progress has made redefining assessment and choosing the appropriate assessment method for the educational process possible. Modern technologies and the Internet have contributed greatly to the development of this important aspect of e-learning.

Many students have suffered from injustice due to inaccuracy in correction and the refusal of the teachers concerned to correct their mistakes even after they realized them on the pretext that they had officially approved the grades or that some teachers were biased towards some male or female students making the students lose their motivation and desire to compete and negatively affecting their academic performance and Grade Point Average (GPAs) during their university study stage in Jordan. Of late, there have been many criticisms and complaints about the process of evaluating and grading exams as a number of university students claimed that they were subjected to injustice from some lecturers through their unfairness in grades and their bias towards some students for one reason or another. As a result, many of these students have expressed their greater satisfaction with electronic exams especially those in which the results appear directly at the end of the test.

Some Arab and foreign studies have discussed electronic exams from several aspects. However, none of these studies directly address the relationship of electronic exams to assessment results or the credibility of the educational system which reinforces the need to conduct such a research study. Several previous studies have also included recommendations on the necessity of using electronic exams in the educational process and conducting more studies and research on them. Al-Zain [12] recommended supporting and encouraging programs for designing and grading electronic exams and training faculty members on them. Al-Jadie [13] recommends encouraging the faculty members who use the computerized exam system, giving them more incentives and conducting more studies on the attitudes of faculty members toward the computerized exam system.

Moreover, Al-Sulami [14] recommended providing the necessary infrastructure to benefit from computerized exam technology due to its advantages such as accuracy in marking, saving time and effort and others. Al-Khaza and Al-Zikri [7] recommended the use of electronic exams in higher education in the Arab world especially in educational disciplines. The research problem is reflected in answering the following questions:

- What is the role of computerized exams in enhancing the credibility of the educational system from the perspective of university students?
- Are there statistically significant differences at the level ($\alpha \leq 0.05$) due to the variables of gender, academic year, and specialization in using the computerized exam to evaluate the academic performance of university students?

The theoretical significance of the current article is reflected in emphasizing electronic exams as a tool that has many advantages compared to traditional paper-based exams and its role in enhancing students' trust in the results of evaluating the outcomes of the educational process and thus enhancing the credibility of the educational system as a whole. Hence, the significance of this article also lies in the role of electronic exams especially those in which students receive their results directly at the end of the test which helps in enhancing the credibility of the overall educational system.

On the other hand, the practical significance is seen in encouraging the transition from traditional evaluation methods "paper exams" to modern evaluation methods "online exams" featured by several positives. The significance is also shown in building more trust between society and educational institutions in general and between the student and the teacher by enhancing the credibility of the educational system. The current research paper is significant as it provides appropriate recommendations based on the results of the study to enhance the credibility of the educational system and mechanisms for evaluating the outcomes of the educational process.

2. Literature Review

The previous studies and research work related to the current article addressing the computerized exams from several aspects are incorporated into this section. Al-Khaza and Al-Zikri [7] investigated the extent of equivalence between computerized and paper exams in measuring university academic achievement and the extent of the impact of computerized exams on their attitudes. The findings indicated the equality of paper and computerized exams in measuring students' academic achievement. However, there are statistically significant differences in favor of computerized exams in terms of the time required to take the test alongside an increase in students' attitudes towards computerized exams.

Al-Ghubaishi [15] discussed the effect of the difference in response style and response time, and the effect of the interaction between response style and response time in computerized exams on the student's performance in the physics test and the attitudes towards computerized exams. The results showed no statistically significant differences between the means of scores of the drop-down list response group and the drag-and-drop response group in performance on the achievement test and the attitudes' scale regardless of response time. The findings also indicated a statistically significant difference between the means of scores of the timed response group and the non-timed response group in performance on the computerized achievement test and the attitudes' scale in favor of the non-timed response group regardless of the response type.

Moreover, Jamil et al. [16] discussed teachers' perceptions of computerized exams compared to paper-based exams. The results showed that teachers' attitudes in general were positive towards computerized exam systems. However, in some cases, they also preferred paper exams. Female, higher-ranking, more qualified and less experienced teachers those with computer certificates and those with experience with computerized exams were relatively more positive towards computerized exams.

Moreover, Al-Khayyat [8] examined the attitudes of students and teachers towards computerized exams at the Faculty of Business at Al-Balqa Applied University. Results indicated positive attitudes among students and teachers toward computerized exams, and students' attitudes toward computerized exams differed according to the gender variable in favor of male students. The findings also showed a positive relationship between students' attitudes toward computerized exams and the student's GPAs.

Besides, Abdulsalam [17] pinpointed the effectiveness of computerized exam in the process of evaluating the performance of achievement exams for MA students of the seventh batch of Educational Technology compared to traditional evaluation that relies on paper and pen, along with the advantages of computerized exams and the difficulties facing their application. The findings show statistically significant differences between the means of scores of the experimental group that did the computerized exam and the control group that did the paper test. The results also show that electronic exams enhance learning, reduce the phenomenon of cheating, support transparency, and increase the credibility of evaluation.

Additionally, Washburn et al. [18] evaluated the impact of the exam methodology on students' performance in physiology exams and students' attitudes in this regard. The results showed that 87% of students preferred paper-based exams over electronic exams despite their better performance in electronic exams as 85% of respondents expressed feeling some tension and anxiety while taking electronic exams and more comfortable while taking paper-based exams. The study also concluded that students' attitudes regarding exam methodology are not affected by test results, and the results did not support the researcher's hypothesis that electronic exams negatively affect test results compared to paper exams.

Likewise, Al-Qdah and Ababneh [19] investigated the effects of electronic exams conducted over the Internet on students' achievements and their perceptions of this type of exams and paper-based exams after experiencing two experimental exams: Internet-based and paper-based. The results were surprising in that the results were similar on electronic and paper exams for multiple-choice, true-or-false and numerical questions. The results of the essay questions showed that students preferred answering them on paper rather than writing on the computer. The survey conducted after the test showed that students preferred electronic exams in terms of feedback and the immediate and automatic appearance of the test results.

An analysis of a number of previous studies and research work related to the current research nature and objectives shows that these studies have multiple aims and purposes. Some studies aimed to test the extent of equivalence between

electronic and paper exams in measuring university academic achievement (see [7]). Others aimed to identify the attitudes of faculty members and students towards electronic exams (see [8]). However, the aim of some studies was only to examine students' attitudes towards electronic exams (see [7, 15]). Some of these studies also aimed to recognize the effectiveness of electronic exams in the process of evaluating the performance of achievement exams (see [17]). Another study also aimed to identify faculty members' attitudes toward employing electronic assessment tools in the educational process [9].

Moreover, this research paper agrees with most of the previous studies addressing the role of electronic exams among university students as one of the elements of the educational process (see [7, 15, 17, 18]). Importantly, the current study differs from previous studies in examining the relationship between the use of electronic exams and the credibility of the educational system. Although previous studies indicate the advantages of electronic exams and the increasing attitudes of students and teachers towards this type of exams, none of them addressed the relationship between the use of electronic exams and the credibility of the educational system or students' trust in it.

The previous studies conducted on electronic exams showed many positives including enhancing learning, reducing the phenomenon of cheating, supporting transparency, saving the time needed to take the test and adding much credibility to evaluation. Most of these studies also show that students and teachers prefer electronic exams over paper exams. Many of these studies recommended using computerized exams in education and measuring the extent of their impact on academic achievement. Thus, the results of many previous studies are in line with the results expected from this research study in one way or another.

3. Methodology

3.1. Research Design

The methodology adapts the descriptive survey approach due to its suitability to the nature of the research objectives. The descriptive survey research approach is also used as it is a method for studying types of research that require selecting an entire research population or a research sample that represents much of the population.

3.2. Research Population

The research population consisted of all the students currently enrolled and studying at the eight faculties at Al-Zaytoonah University of Jordan for the academic year (2023/2024). Al-Zaytoonah University of Jordan is a private university located in the capital, Amman on the road to Queen Alia International Airport. It was established in 1993 and obtained its license and accreditation on September 6, 1993, pursuant to Higher Education Council Resolution No. (848). With its establishment, it has been seeking to prepare the student scientifically and morally to be able to fulfill his responsibility in serving his homeland and nation. The university consists of the following eight faculties: Faculty of Arts, Faculty of Law, Faculty of Business, Faculty of Architecture and Design, Faculty of Science and Information Technology, Faculty of Pharmacy, Faculty of Nursing, and Faculty of Engineering and Technology.

3.3. Research Participants

The research sample included 700 questionnaires distributed in a stratified random sampling method to a sample representative of the number of students at Al-Zaytoonah University of Jordan selected according to the table for determining sample size through population size. After four weeks had passed, 680 questionnaires were returned to ensure that all the included items were answered while 69 questionnaires were excluded because all of their items were not answered or there were some errors in the responses. The number of questionnaires suitable for analysis was 611, i.e., 89.9%) which is an acceptable percentage.

3.4. Research Instruments

The research instrument is a questionnaire developed as a data collection instrument to measure the opinions of the research sample members on the role of using computerized exams in enhancing the credibility of the educational system from the perspective of students at Al-Zaytoonah University of Jordan. Interviews were also conducted with a group of students at the selected university. The degree of the credibility of the educational system from the perspective of students at Al-Zaytoonah University of Jordan is determined by giving a graduated weight to the alternatives for the approval degree items according to a 5-point Likert scale as follows: "very high" with five degrees, "high" with four degrees, "medium" with three degrees, "low" with two degrees, and "very low" with one degree. The degrees of the items on the role of using computerized exams in enhancing the credibility of the educational system from the perspective of students at Al-Zaytoonah University of Jordan were determined by three levels "high, medium, low" according to the following equation:

Degree of Application= (the Highest Value - the Minimum Value) ÷ Number of Levels = (5-1) ÷ 3 = 1.33 by adding 1.33 to the minimum value of the alternative (the minimum), the criterion for expressing those levels is as follows: The mean ranging between 1 and 2.33 indicates a low degree, the mean ranging between 3.67and 2.34 indicates a medium degree and the mean ranging between 3.68 and 5 indicates a high degree.

3.5. Research Instrument Validity Testing

Face validity is used to check the research instrument validity by reviewing the 34-item questionnaire in its final form from experienced and specialized faculty members with experience in the educational technology area in Jordanian universities. The comments, modifications and recommendations proposed by the validators are taken into account, selecting the items that have obtained an approval rating of 89%. Table 1 shows the questionnaire distributed to the

research sample where the questionnaire was designed in its final form from 28 items divided into four parts in light of these modifications. The first part includes personal data attributed to the following variables "gender, academic year, specialization, and number of times of taking a computerized exam". The second part is related to the degree of trust and credibility, consists of 13 items and follows a 5-point Likert scale in its grading as follows: "very high", "high" "medium", "low", and "very low".

The third part is related to easiness and acceptability consisting of 9 items while the fourth part is related to transparency and preference composed of 6 items. Tables 1 to 3 detail the distribution of questionnaire items.

Table 1.
Personal characteristics of the research sample.

Number of items	Characteristics
2	Gender
5	Academic year
2	Specialization
4	The number of times of taking a computerized exam

Table 2.
Research instrument and variable items.

Number of items	Questionnaire sections
13	Second part
9	Third part
6	Fourth part

Table 3.
Five-point Likert scale.

Very high	High	Medium	Low	Very low
5 degrees	4 degrees	3 degrees	2 degrees	I degree

3.6. Research Instrument Reliability Testing

The research instrument reliability is checked and ensured by using the internal consistency method and the test-retest reliability method where the internal consistency was calculated using Cronbach's alpha coefficient. The Cronbach's alpha coefficient must be equal to or greater than 60% to ensure that the questionnaire has a high degree of reliability. The instrument was also applied to an exploratory sample consisting of 30 individuals other than the research sample with a time interval of two weeks and the reliability coefficient was calculated using the Pearson correlation coefficient. Table 4 illustrates the Cronbach's alpha coefficients and Pearson values for the research instrument.

Table 4.
Results of the consistency reliability coefficient "Cronbach's alpha" and Pearson's coefficient for the research variables and the overall instrument.

Variables	Number of items	Cronbach's alpha coefficient	Pearson's coefficient
Trust and credibility	13	0.745	0.77
Easiness and acceptability	9	0.748	0.81
Transparency and preference	6	0.840	0.79

According to Table 4, the values of the Cronbach's alpha coefficients indicate the internal consistency and reliability of the research instrument items are higher than 0.60 where the variable "trust and credibility" obtained a value of 0.745. However, the variable "easiness and acceptability" obtained a value of 0.748 while the variable "transparency and preference" obtained a value of 0.840 which indicates the presence of internal consistency and high reliability of the research instrument.

3.7. Research Variables

3.7.1. Independent Variable

Computerized Exam Use: It includes four sub-variables which are the personal characteristics of the respondent "the assumed user of computerized exams". They are

Gender: Male and female.

1. Academic Year: First, second, third, fourth, and fifth.
2. Specialization: Scientific and humanities.
3. School Type: Public and private.
4. Number of Times of Taking a Computerized Exam: One time, two to five times, six or more times and never taking a computerized exam.

3.7.2. Dependent Variable

Enhancing the credibility of the educational system from the perspective of students at Al-Zaytoonah University of Jordan includes three sub-variables which are as follows: It includes three sub-variables which are as follows:

1. Trust and Credibility.

2. Easiness and Acceptability.
3. Transparency and Preference.

4. Results

This section presents the research results after applying the questionnaire by analyzing the research study data and answering its questions.

4.1. Personal Characteristics of the Research Sample

According to their personal characteristics, Table 5 shows the distribution of the research sample members.

Table 5.
Personal characteristics of the research sample.

Variables	Number of items	Cronbach's alpha coefficient	Pearson's coefficient
Trust and credibility	13	0.745	0.77
Easiness and acceptability	9	0.748	0.81
Transparency and preference	6	0.840	0.79

According to Table 5 regarding gender, the percentage of males was 50.4% and the percentage of females was 49.6% as it is noted that the percentage of males and the percentage of females are somewhat close. The researcher explains this convergence to the large size of the sample as he could reach a fair number of both genders. Concerning the academic year, the percentage of students in the first year was 43.7%, with a frequency of 267 while the percentage of students in the second year was 20.9% with a frequency of 128. However, the percentage of students in the third year was 9.2% with 56 male and female students while the percentage of students in the fourth year was 19% with 116 male and female students. Finally, the percentage of the study sample that is in the fifth year of study was 7.2% with 44 male and female students.

Relating to specialization, the percentage of students in scientific specializations was 60.2% with a total number of 368 while the percentage of students in humanities specializations was 39.8% with 243 male and female students. Regarding the number of times of taking a computerized exam, it was found that the number of students who took the test only once was 66 male and female students at a rate of 10.8% . The number of students who took the test two to five times was 218 male and female students at a rate of 35.7%. However, the number of students who took the computerized exam 6 or more times is 320 male and female students at a rate of 52.4% while the number of students who did not take any computerized exam was 7 students at a rate of 1.1%.

4.2. Results Related to the Research Questions

The means, standard deviations, and relative significance of the research variables were calculated to answer the research questions. The following is a breakdown of the items that express the variables and answer the research questions:

4.2.1. First: Results related to the First Research Question

What is the role of computerized exams in enhancing the credibility of the educational system from the perspective of university students?

a. Table 6 illustrates the following results: Means and standard deviations, ranks, and degrees of trust and credibility.

Table 6.
Means and standard deviations, ranks, and degrees of trust and credibility.

Variables	Category	Frequency	Percentage
Gender	Male	308	%50.4
	Female	303	%49.6
Academic year	First	267	%43.7
	Second	128	%20.9
	Third	56	%9.2
	Fourth	116	%19.0
	Fifth	44	%7.2
Specialization	Scientific	368	%60.2
	Humanities	243	%39.8
The number of times of taking a computerized exam	One time	66	%10.8
	Two to five times	218	%35.7
	Six or more times	320	%52.4
	Never take a computerized exam	7	%1.1
Total		611	100%

According to Table 6, the majority of items related to trust and credibility in computerized exams by the research sample represented by a number of students who study at Al-Zaytoonah University of Jordan obtained high and medium scores ranging between 2.89 and 4.49 as the general mean for the entire items is 3.83 with a standard deviation of 0.54. Item 1 stipulating “The use of computerized exams is characterized by higher reliability in correction than the use of

traditional paper tests" is ranked first with a mean of 4.49 with a standard deviation of 0.82. Item 2 stipulating "The use of computerized exams reduces the effect of the tester's mood on the test results" is ranked second with a mean of 4.46 and a standard deviation of 0.85. However, item 13 stipulating "The use of computerized exams reduces cheating" is ranked last with a mean of 2.89 with a standard deviation of 1.47. Given the results, it is found that computerized exams enjoy high trust and credibility among students studying at Al-Zaytoonah University of Jordan because the computerized system evaluates students objectively based on their realistic levels and is far from mediators, external interference, and bias.

b. Table 7 illustrates the following results: Means and standard deviations, ranks, and degrees of easiness and acceptability.

Table 7.
Means and standard deviations, ranks, and degrees of easiness and acceptability.

#	Text of items	AM	SD	Rank	Degree
1	The use of computerized exams is characterized by higher reliability in correction than the use of traditional paper tests.	4.49	0.82	1	High
2	Computerized exams are better able than traditional paper tests to measure the various knowledge of the student.	3.87	1.06	9	High
3	Computerized exams monitor students' grades objectively based on their actual levels.	3.94	1.27	8	High
4	I trust the test result more when using computerized exams.	4.12	1.18	7	High
5	I have more trust in the test result when using traditional paper-based tests.	3.50	1.16	11	Medium
6	Using computerized exams increases trust in the evaluation process followed by the university.	4.29	0.85	5	High
7	Using computerized exams strengthens the relationship between me and the instructor.	3.76	1.28	10	High
8	The use of computerized exams enhances the credibility of the educational system in general.	4.38	0.96	3	High
9	The use of computerized exams increases cheating.	3.10	1.32	12	Medium
10	The use of computerized exams reduces cheating.	2.89	1.47	13	Medium
11	The use of computerized exams reduces the influence of personal relationships on test results.	4.24	0.99	6	High
12	The use of computerized exams limits the interference of mediator in the results.	4.37	0.83	4	High
13	The use of computerized exams reduces the effect of the tester's mood on the test results.	4.46	0.85	2	High
The entire items of trust and credibility		3.83	0.54	High	

According to Table 7, the majority of items related to easiness and acceptability in computerized exams by the research sample represented by a number of students who study at Al-Zaytoonah University of Jordan obtained high, medium, and low scores ranging between 1.84 and 4.33 as the general mean for the entire items is 3.72 with a standard deviation of 0.37. Item (1) stipulating "Using computerized exams is easier than traditional paper tests" is ranked first with a mean of 4.33 with a standard deviation of 1.01. Item 21 stipulating "Using computerized exams requires technological skills that I do not possess sufficiently" is ranked second with a mean of 4.30 and a standard deviation of 0.98. However, item16 stipulating "I feel anxious and stressed when using computerized exams" is ranked last with a mean of 1.84 with a standard deviation of 1.17. Given the results, it is concluded that computerized exams are accepted by students studying at ZUJ due to several factors including the easy implementation.

c. Table 8 illustrates the following results: Means and standard deviations, ranks, and degrees of transparency and preference.

Table 8.
Means and standard deviations, ranks, and degrees of transparency and preference.

#	Text of item	AM	SD	Rank	Degree
23	The use of computerized exams achieves a greater degree of fairness among students.	4.54	0.88	1	High
24	The immediate appearance of the results in computerized exams supports transparency and enhances the credibility of the assessment.	4.40	0.83	3	High
25	I always prefer to use computerized exams.	4.26	1.10	4	High
26	I always prefer to use traditional paper tests.	2.88	1.09	5	Medium
27	I prefer to use computerized exams sometimes and traditional paper tests other times.	2.80	1.23	6	Medium
28	Computerized exams with immediate results are more reliable than traditional paper tests whose results. appear later.	4.51	0.84	2	High
The entire items of transparency and preference		3.73	0.48	High	

According to Table 8, the majority of items related to transparency and preference in computerized exams by the research sample represented by a number of students who study at Al-Zaytoonah University of Jordan obtained high and

medium scores ranging between 2.80 and 4.54 as the general mean for the entire items is 3.73 with a standard deviation of 0.48. Item 23 stipulating "The use of computerized exams achieves a greater degree of fairness among students" is ranked first with a mean of 4.54 with a standard deviation of 0.88. Item 28 stipulating "Computerized exams with immediate results are more reliable than traditional paper tests whose results" is ranked second with a mean of 4.51 and a standard deviation of 0.84. However, item 27 stipulating "I prefer to use computerized exams sometimes and traditional paper tests other times" is ranked last with a mean of 2.80 with a standard deviation of 1.23. Given the results, it is concluded that the degree of acceptability of computerized exams by students studying at ZUJ is high due to the transparency, fairness, and credibility granted to students through computerized exams.

4.2.2. Second: Results Related to the Second Research Question

Are there statistically significant differences at the level ($\alpha \leq 0.05$) due to the variables of gender, academic year and specialization in using the computerized exam to evaluate the academic performance of university students?

4.2.2.1. Gender

The t-test for independent samples was used to find out whether there were statistically significant differences attributable to the gender variable. Table 9 illustrates the following results:

Table 9.
Means, standard deviations, and t-tests for two independent samples for the degree of use of computerized exams in evaluating students' academic performance according to the gender variable.

Variables	Gender	Number	AM	SD	T	Sig. level
Trust and credibility	Male	308	3.93	0.534	4.59	0.00
	Female	303	3.73	0.540		
Easiness and acceptability	Male	308	3.32	0.394	2.44	0.015
	Female	303	3.25	0.337		
Transparency and preference	Male	308	3.74	0.302	0.49	0.62
	Female	303	3.72	0.426		
Overall degree	Male	308	3.69	0.367	4.01	0.000
	Female	303	3.57	0.369		

According to Table 9, it is noted that the t-value was statistically significant at a level of less than 0.05 for the overall variables indicating the presence of statistically significant differences depending on the gender variable in favor of males, with a t-value of 4.01and a significance level of 0.00. However, the t-values for the sub-variables "trust and credibility, easiness and acceptance also showed statistically significant differences according to the gender variable as they were 4.59 and 2.44 and at a significance level of 0.00. Moreover, the results indicated no statistically significant differences according to the gender variable for the transparency and preference sub-variable where the t-value was 0.49 with a significance level of 0.62.

4.2.2.2. Academic Year

Means and standard deviations were calculated for the independent samples to find out whether there were statistically significant differences attributable to the academic year variable. Table 10 illustrates the following results:

Table 10.
Means and standard deviations for independent samples for the degree of use of computerized exams in evaluating students' academic performance according to the academic year variable.

Variables	Academic year	Number	AM	SD
Trust and credibility	First	267	4.01	0.411
	Second	128	4.06	0.430
	Third	56	3.66	0.366
	Fourth	116	3.38	0.684
	Fifth	44	3.55	0.434
Easiness and acceptability	First	267	3.33	0.363
	Second	128	3.41	0.318
	Third	56	3.38	0.265
	Fourth	116	3.04	0.384
	Fifth	44	3.15	0.271
Transparency and preference	First	267	3.76	0.268
	Second	128	3.78	0.217
	Third	56	4.10	0.306
	Fourth	116	3.46	0.523
	Fifth	44	3.70	0.320
Overall degree	First	267	3.73	0.243
	Second	128	3.79	0.293
	Third	56	3.66	0.263
	Fourth	116	3.29	0.508
	Fifth	44	3.45	0.276

According to Table 10, there were apparent differences in the means in the use of computerized exams to evaluate the academic performance of students at ZUJ according to the academic year variable, as they ranged between 3.04 and 4.10 over the various academic years. A one-way ANOVA "analysis of variance" was used. Table 11 illustrates the following results:

Table 11.
One-way ANOVA to find out whether there were statistically significant differences between the means of the academic year variable.

Source of variance		Sum of squares	DF	Mean squares	F-value	Sig. level
Trust and credibility	Between groups	44.130	4	11.033	48.572	0.000
	Inside groups	137.645	606	0.227		
	Total	181.775	610	11.260		
Easiness and acceptability	Between groups	10.690	4	2.672	22.486	0.000
	Inside groups	72.023	606	0.119		
	Total	82.713	610	2.791		
Transparency and preference	Between groups	16.739	4	4.185	38.391	0.000
	Inside groups	66.056	606	0.109		
	Total	82.795	610	4.294		
Overall degree	Between groups	21.409	4	5.352	51.258	0.000
	Inside groups	63.277	606	0.104		
	Total	84.686	610	5.456		

According to Table 11, there were statistically significant differences for all variables as the f-value for the overall degree is 51.258 with a significance level of 0.000. Furthermore, there were statistically significant differences for all variables of trust and credibility, easiness and acceptability, and transparency and preference where the f-values are 48.572, 22.486, and 38.391 respectively with a significance level of 0.000.

4.2.2.3. Specialization

The t-test for independent samples was used to find out whether there were statistically significant differences attributable to the specialization variable. Table 12 illustrates the following results:

Table 12.
Means, standard deviations, and t-tests for two independent samples for the degree of use of computerized exams in evaluating students' academic performance according to the specialization variable.

Variables	Specialization	Number	AM	SD	T-value	Sig. level
Trust and credibility	Scientific	368	3.89	0.531	3.24	0.001
	Humanities	243	3.75	0.557		
Easiness and acceptability	Scientific	368	3.30	0.376	1.83	0.068
	Humanities	243	3.25	0.354		
Transparency and preference	Scientific	368	3.75	0.341	1.51	0.130
	Humanities	243	3.70	0.406		
Overall degree	Scientific	368	3.67	0.367	3.11	0.002
	Humanities	243	3.58	0.374		

According to Table 12, the t-value was statistically significant at a level of less than 0.05 for the overall variables as it was found that there were statistically significant differences depending on the specialization variable in favor of scientific specializations, as the t-value is 3.11 with a significance level of 0.002. The t-values for the sub-variables "trust and credibility and easiness and acceptance" also showed statistically significant differences depending on the specialization variable, where they were 3.24, 1.83 respectively with the significance level of 0.001 and 0.068. However, it was found that there were no statistically significant differences depending on the specialization variable for the transparency and preference variable where the t-value is 1.51 with the significance level of 0.130.

4.2.2.4. Number of Times of Taking a Computerized Exam

Means and standard deviations were calculated for the independent samples to find out whether there were statistically significant differences attributable to the variable of number of times of taking a Computerized Exam. Table 13 illustrates the following results:

Table 13.
Means and standard deviations for independent samples for the degree of use of computerized exams in evaluating students' academic performance according to the variable of number of times of taking a computerized exam.

Variables	Number of times of taking a computerized exam	Number	AM	SD
Trust and credibility	One time	66	4.07	0.375
	Two to five times	218	4.02	0.422
	Six or more times	320	3.65	0.592
	Never take a computerized exam	7	4.15	0.000
Easiness and acceptability	One time	66	3.43	0.168
	Two to five times	218	3.29	0.334
	Six or more times	320	3.25	0.414
	Never take a computerized exam	7	3.33	0.000
Transparency and preference	One time	66	3.75	0.153
	Two to five times	218	3.73	0.229
	Six or more times	320	3.72	0.466
	Never take a computerized exam	7	4.00	0.000
Overall degree	One time	66	3.80	0.223
	Two to five times	218	3.72	0.256
	Six or more times	320	3.54	0.436
	Never take a computerized exam	7	3.86	0.000

According to Table 13, there were apparent differences in the means in the use of computerized exams in evaluating the academic performance of students at ZUJ according to the variable number of times of taking a computerized exam, ranging between 3.25 and 4.07 and according to the different number of times taking a computerized exam . To find out whether the differences were statistically significant between the means at the significance level ($\alpha = 0.05$), a one- way ANOVA "analysis of variance" was used. Table 14 illustrates the following results:

Table 14.
One-way ANOVA to find out whether there were statistically significant differences between the means of the variable of number of times of taking a computerized exam.

Source of variance		Sum of squares	DF	Mean squares	F-value	Sig. level
Trust and credibility	Between groups	22.148	3	7.383	28.074	0.000
	Inside groups	159.627	607	0.263		
	Total	181.775	610	7.646		
Easiness and acceptability	Between groups	1.853	3	0.618	4.636	0.003
	Inside groups	80.860	607	0.133		
	Total	82.713	610	0.751		
Transparency and preference	Between groups	0.550	3	0.183	1.354	0.256
	Inside groups	82.244	607	0.135		
	Total	82.795	610	0.318		
Overall degree	Between groups	6.662	3	2.221	17.285	0.000
	Inside groups	78.025	607	0.129		
	Total	84.686	610	2.35		

According to Table 14, there were statistically significant differences for all variables, as the f-value for the overall degree is 17.285 with a significance level of 0.000. Also, there were statistically significant differences for the two variables of trust and credibility and easiness and acceptability, where the f-values are 4.636 and 28.074 respectively with a significance level of 0.000. Moreover, regarding the transparency and preference variable, it was found that there were no statistically significant differences attributed to the number of times of taking computerized exams.

5. Discussion

This section delves into the discussion of the results of the two research questions.

5.1. First: Discussion Related to the First Research Question

What is the role of computerized exams in enhancing the credibility of the educational system from the perspective of university students?

The research results indicate that the majority of items related to trust and credibility in computerized exams by the research sample represented by a number of students who study at Al-Zaytoonah University of Jordan obtained high and medium scores ranging between 2.89 and 4.49 as the general mean for the entire items is 3.83 with a standard deviation of 0.54 . It is found that these percentages are high due to the complete belief of students at ZUJ that the presence of an electronic system governed by competent authorities cannot be accessed by others in addition to the possibility of error in

the scoring of grades or the presence of bias. Computerized exams are unlike paper-based exams as paper-based exams may have some intentional or unintended errors as well as bias that may occur on the part of some teachers towards a number of students. These results are consistent with the results of Abdulsalam [17] which concluded that computerized exams enhance learning, reduce the phenomenon of cheating, support transparency and increase the credibility of evaluation as learners prefer computerized exams over paper tests.

Moreover, the research results show that the majority of items related to easiness and acceptability in computerized exams by the research sample represented by a number of students who study at Al-Zaytoonah University of Jordan obtained high, medium, and low scores ranging between 1.84 and 4.33 as the general mean for the entire items is 3.72 with a standard deviation of 0.37. The difference in these percentages is explained as a result of the difference in students' experience with computerized exams, as some of them believe that there is easiness in submitting the computerized exam while some of them see the opposite. In addition, some students do not accept such tests as they view them as being difficult and accompanied by a feeling of anxiety and tension. These results are consistent to some extent with the results of the study of Al-Khaza and Al-Zikri [7] which showed an increase in students' attitudes towards computerized exams, and with the study of Jamil et al. [16] demonstrating that the attitudes of the teachers included in the study were positive towards computerized exam systems. These results are also along with the results of the study conducted by Al-Qdah and Ababneh [19] indicating that students prefer computerized exams in terms of feedback and the appearance of the test result immediately and automatically.

Besides, the research results demonstrate that the majority of items related to transparency and preference in computerized exams by the research sample represented by a number of students who study at Al-Zaytoonah University of Jordan obtained high and medium scores ranging between 2.80 and 4.54 as the general mean for the entire items is 3.73 with a standard deviation of 0.48. According to the results, it is believed that the increase in these percentages was the result of the fact that computerized exams achieve a greater degree of fairness among students and avoid bias towards any male or female student, and that the appearance of the results immediately after the end of the test achieves transparency and increases the student's confidence in the results of the evaluation process.

These results are also in line with the results of Dammas [20] indicating that the majority of study participants (83.7%) had a positive attitude towards computerized exams, achieving their satisfaction in terms of immediate correction, accuracy, and transparency. Furthermore, these results are consistent with the results of Al-Khayyat [8] which indicated the presence of positive attitudes among students and teachers toward computerized exams and the difference in students' attitudes toward computerized exams according to the student's gender variable in favor of male students. On the other hand, the results of this study did not agree with the results of Washburn et al.'s [18] study which showed that the majority of students preferred paper tests over computerized exams despite their better performance in the computerized exams because they felt some tension and anxiety while taking the computerized exams and felt more comfortable while taking the paper tests.

5.2. Second: Discussion Related to the Second Research Question

Are there statistically significant differences at the level ($\alpha \leq 0.05$) due to the variables of gender, academic year, and specialization in using the computerized exam to evaluate the academic performance of university students?

The research results indicate statistically significant differences at a level of less than 0.05 for the overall variables depending on the gender variable in favor of males, with a t-value of 4.01 and a significance level of 0.00. However, the t-values for the sub-variables "trust and credibility, easiness and acceptance also showed statistically significant differences according to the gender variable, as they were 4.59 and 2.44 respectively at a significance level of 0.00. Moreover, the results indicated no statistically significant differences according to the gender variable for the transparency and preference sub-variable where the t-value was 0.49 with a significance level of 0.62. Furthermore, it is noted that there were apparent differences in the means in the use of computerized exams to evaluate the academic performance of students at ZUJ according to the academic year variable, as they ranged between 3.04 and 4.10and over the various academic years.

Additionally, there were statistically significant differences for all variables as the f-value for the overall degree is 51.258 with a significance level of 0.000. Moreover, there were statistically significant differences for all variables of trust and credibility, easiness and acceptability, transparency, and preference where the f-values are 48.572, 22.486, and 38.391 with a significance level of 0.000.

The results also showed statistically significant differences depending on the specialization variable in favor of scientific specializations as the t-value is 3.11 with a significance level of 0.002. The t-values for the sub-variables "trust and credibility and easiness and acceptance" also showed statistically significant differences depending on the specialization variable, where they were 3.24 and 1.83 with the significance level of 0.001 and 0.068. However, it was found that there were no statistically significant differences depending on the specialization variable for the transparency and preference variable, where the t-value is 1.51with the significance level of 0.130. Moreover, it is found that there were apparent differences in the means in the use of computerized exams in evaluating the academic performance of students at ZUJ according to the variable number of times of taking a computerized exam ranging between 3.25 and 4.07 and according to the different number of times taking a computerized exam.

6. Conclusion

In a nutshell, the current article identifies the role of computerized exam use in enhancing the credibility of education system from Al-Zaytoonah University of Jordan students' perspective. Utilizing descriptive survey research, the research findings indicate that computerized exams have a high degree of trust and credibility among university students and receive

high acceptance and preference. The results indicate statistically significant differences at a level of less than 0.05 for the overall variables depending on the gender variable in favor of males, with a t-value of 4.01 and a significance level of 0.00. The article concludes by supporting the expansion of the use of computerized exams, especially those that show the results immediately in assessing the academic performance and academic achievement of students as it provides a sense of confidence in the integrity and transparency of the test and enhances the credibility of the educational system. Another recommendation is developing modern and more effective software and computerized exam methods capable of measuring the largest possible number of skills and knowledge to encourage students and teachers to move toward this type of test.

7. Research Implications

Given the results and discussion previously conducted, the current article recommends supporting the expansion of the use of computerized exams especially those that show the results immediately in assessing the academic performance and academic achievement of students as it provides a sense of confidence in the integrity and transparency of the test and enhances the credibility of the educational system. Another recommendation is developing modern and more effective software and computerized exam methods capable of measuring the largest possible amount of skills and knowledge to encourage students and teachers to move toward this type of test.

The research paper also recommends training teachers on preparing, developing and using computerized exams and keeping abreast of global developments in this regard and also training students on all the skills required to perform computerized exams, alongside spreading a positive culture about computerized exams among teachers and students by focusing on raising awareness of their positives, developing them and addressing their negatives. Other key recommendations are reflected in reviewing and developing evaluation means in the educational system as a whole and developing relevant legislation towards obliging educational institutions especially at the university levels, to use computerized exams in student evaluation processes at least in some courses or some specializations as a first stage.

More important recommendations lie in calculating additional points in the quality systems and mechanisms for evaluating and accrediting educational institutions by the Ministry of Higher Education and its departments for Jordanian universities if they use computerized exams as one of the methods for evaluating the academic achievement and academic performance of their students. The research paper also recommends conducting more academic studies on computerized exams, which may strengthen the results of this research study and support its recommendations.

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