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Examining the Impacts of E-Learning and Online Assessment on Science and Humanities Disciplines: A Case Study of the University of Baghdad

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Abstract

Iraqi universities are benefiting greatly and increasingly from electronic technology to ensure the continuity of the educational process and effective, clear and easy access to the material for the student, especially after the (Covid-19) pandemic. Where a number of procedures and measures have been taken regarding the postgraduate admission test to ensure the highest degree of security and safety for the applicant, whether the test is paper or electronic. In this study, the types of evaluation that the applicant undergoes for admission to postgraduate studies in Iraqi public universities (paper and electronic) were presented, where a number of e-learning management systems adapted, random samples taken from (920) applicants for postgraduate studies at the University of Baghdad . For the academic year 2019-2020 divided into four independent groups: (230 samples / group) for each. The groups were divided according to the type of evaluation, as it includes the group that underwent the electronic evaluation according to the Moodle program, classified into two categories according to the type of study (scientific and human), as well as the division of the group that underwent the paper evaluation. Using the spss program to conduct a (t) test between two groups of the same specialized classification (paper, electronic, scientific and human) to test statistical significance and efficiency of samples. Results showed that they are statistically significant at the level (0.05) in favor of the electronic test for the scientific majors compared to the humanities majors, while it was found that there were no clear statistically significant differences between the averages of the two samples. Hence, we conclude that the use of the electronic test is more effective in the performance of applicants than the paper-based test for scientific disciplines..

Keyword: Traditional education, E-Learning, postgraduate, Classroom platform, LMS

1. Introduction

One of the important measures by which the development of countries is measured is the field of education, which is considered an important field for any country, including Iraq, which sought to raise the level of education for citizens, as the Iraqi Constitution No. (118) of (1976) guaranteed the right to

free education for all members of society and encouraged eradication programs Illiteracy, although Iraq is considered among the countries that have graduated from the classification of the level of education in the recent period, according to the education quality index issued by the International Economic Forum in Davos and the education quality index, for many reasons, including security, political, economic and social as well as external pressures. The diversity of educational media is one of the main components of education, which can be summarized as follows: (goal, educational materials, infrastructure (human and material) and others), where traditional methods faced many obstacles and problems, and to reach the desired goal it was necessary to identify the factors that help in improving the level of education. Students develop their perception of space, furniture, physical environment and decorative perceptions in the lecture hall and to help them gain positive perceptions about learning and the role of design and building improvement by providing rich and comprehensive learning environments [1]. In addition to the human factors, effort and time taken by the student, teaching and administrative staff, insufficient time to answer the tests, lack of transparency in the results of the tests, in addition to other problems. For the development of education methods and their connection to the life of the individual and the prominent role of the media and its impact on the education process, especially after the spread of the (Covid-19) epidemic and the imposition of curfews to control the spread of the epidemic, so countries relied on e-learning, including Iraq. Where e-learning was considered as an alternative to face-to-face education at all levels of study, what helped in this is the widespread use of the Internet (a computer network that connects governmental and non-governmental sites, whether commercial, academic or individuals). Where various programs were used to deliver the information to the student, and then conduct the test for evaluation, including the Moodle program, Google Classroom, and others, as it was designed to facilitate cooperation between the teacher and the learner [2]. According to the study conducted by Shannon Washburn, and others in [3] to compare the paper and electronic exams, they found that 87% of those surveyed preferred to take the paper exam instead of the electronic form, because the additional anxiety of the student from the exam is related In the form of the electronic exam, which played a major role in determining the direction for it. While after a period of using


electronic programs, (SMA Negeri,2020) [4] found in his study an increase in students' enthusiasm for using it in home learning due to the spread of the epidemic, as he indicated that it was used effectively through the Google classroom to supplement the curric. As a result of the connection of technology and communications and the rapid and massive development in it, it is logical that e-learning spread to serve the goal of education, which is to deliver information in all possible ways, whether by interacting with the learner through direct lectures, video, audio media, or others. The lack of use of electronic methods in education is one of the reasons for the low level of education. Education, which greatly affects the life of an individual. Therefore, universities tended to use electronic platforms for primary and higher studies, as they relied on them to deliver lectures to students and then evaluate them. (Keith R. Heggart, Joanne Yoo, 2018) [5] found that thinking about how to benefit from major software changes in teaching due to the increased dependence of higher education institutions on structured digital platforms, therefore, increased attention should be paid to the experience and training of students and teachers on it, and it can be determined Four key concepts that influence the likelihood of learning success (accessibility, collaboration, student voice/agency, and speed). Final exam is the assessment that is counted within the student's grade. It is necessary that the content includes a wide range of knowledge and comprehensive, as well as testing during the training course, so that the participant can better plan their progress, although the main goal of the quizzes is to help students learn, but that does not mean relying on them as a degree for the training course [11]. There are multiple forms of computer-based exams including: Computer-Based Testing (CBA), Computer-Aided Testing, Computerized Assessment, Computer-Based Testing (CBT), Computer-Aided Assessment (CAA), Online Assessment, E-Assessment, Web-Based Assessment and others. Where (Shampa Iftakhar, 2016) [6] showed that the education of the twenty-first generation. It requires the assistance and monitoring of students to learn in accordance with the development taking place in technology. Therefore, teachers must be encouraged to adopt modern technologies to ensure the best ways of teaching in the virtual reality of the classrooms in addition to the physical classrooms. At DIU, it provides an appropriate opportunity to enhance blended learning and professional

development. Examinations also improve teaching methods by assisting in teacher planning and preparing students in a consistent manner. Admission test for postgraduate studies, for example. Due to the different levels of applicants for postgraduate studies and to achieve the principle of equality and equal opportunities for applicants, the applicant underwent a test through which his eligibility for admission was determined according to a specific mechanism and conditions The evaluators were concerned that the change in how the test was performed from traditional paper tests to electronic tests would affect the applicant's performance For testing whether it is a test for exams within the classroom, online tests, standardized tests for university admissions, or licensing exams where the goal of testing is to reduce scoring errors, efficient use of large question banks, testing safety, cost and time reductions, adaptive testing capability, improved analysis of individual student performance, as data retention for item analysis Automatic and learning. Several studies have reported that high test anxiety is a predictor of poor academic performance [3] . zwan Nizal Moh & others (2016) [7], and Almio Susetyo Harjanto, Sri Sumarni, 2019) [21], found that students are generally satisfied with the use of the software and its positive impact, as it is not only a program that helps trainers in online training And the use of educational methods and design, but rather as support programs that allow students to succeed in the Internet environment, enhance collaborative learning, reduce the problem and save time. But also an educational tool that will support teaching and learning to mine relevant data and applications as well as encourage teachers to be creative. I identified a number of factors that affect the preference of any method that is used for testing (paper or electronic), including the continuous development of technology and software, the extent of skill of applicants in using the computer, and inconsistency in the testing environment such as question design, monitoring, and test time [8], (Dr. Manal Muhammad Ibrahim, 2021) [9]. The education management system has proven its worth in universities and over a period of time, as stated in the study (Mohammed Ateeq Alanezi, 2018) [10], where the study was conducted in the College of Computing and Information Technology, and an open source platform, Moodle, was adopted. This is due to its extreme ease of use and it is very safe to be used by individuals. Instead of the classic system of paper work, despite the difficulties those working on it


faced at the beginning of use. However, Moodle's robust design and features make it possible for all users to adapt to the system at CCIT without fail. This paper presents the results of a comparative study between paper-based and online exams administered in a number of groups of postgraduate applicants to the University of Baghdad; most of them experience online exams for the first time in Baghdad, Iraq for the academic year 2019/2020.

2. Purpose of the study

Statement whether the teaching or exam format (traditional or electronic) was affected by the results of the students in the entrance exam for postgraduate studies for scientific or human specializations

٣. Research hypothesis

The hypotheses adopted in the research are:

Are there significant differences between the average scores of the applicants who took the electronic test and those who took the paper test and the second hypothesis Are there significant differences between the average scores of the applicants And for the scientific and humanities majors for the applicants who taken test electronic and paper ?

٤. The Theoretical side

٤-1 Teaching Methods

The goal of academic education is to build an individual with performance and cognitive capabilities and skills, who invest in building and developing society. Approved (traditional) methods in curricula, teaching, tests and courses to distinguish individual differences and differences between students [٢] . But after the tremendous leap of humanity and the emergence of the Internet, the need to go towards electronic education increased for several reasons, including (the possibility of education for all groups of society, especially for low-income people at any time, as well as the opportunity to keep pace with rapid developments in all areas of life and others), despite the benefits provided by the Internet In the field of education, its uses are still limited, due to (the lack or weakness of human capabilities (specialized trained staff) and material (infrastructure in the fields of electricity and communications) as well as the officials 'lack of understanding of the importance and role of modern technology in education [13,12] online assessment is more objective than the traditional assessment and also has access to the course and topics, and a virtual library

that they can access at any time [14], We include below the most common teaching methods approved by most institutions.

٤-1-1 Traditional education

A Traditional education (face to face) is by throwing the material directly at the learner inside classrooms dedicated and affectionately equipped with tools that help in the delivery of the material and are designed for this purpose within the architectural design of the college on a large scale. In a regular and orderly manner, with the availability of the teacher's access to educational equipment to control it and follow-up students to know the learner who needs help in the material from others, as well as ease of interaction using different educational methods to deliver the largest amount of material in a clear and easy manner [1]. In addition, the duration of the lecture time and the type of study material have a role in keeping pace with the student and his concentration and absorption of the material, as their concentration decreases the longer the duration of the lecture. To determine the level of the student and to indicate the individual differences between them, a paper test was adopted (before the technology revolution and linking it to education) and it is within the scope of the student's study and is usually of a comprehensive nature. Developing the elements or quality of the paper test depends mainly on extensive experience and scientific research, as creating questions that depend on multiple tests is a difficult task, although it contributes to the process of learning and teaching in universities and postgraduate studies by developing a variety of different question papers according to specialization. The answer shall be on blank paper and within a specified period of time in classrooms or laboratories, while ensuring appropriate spacing (to reduce cheating) under the supervision and supervision of teachers, after verifying the student's university identity or official identification papers [8]. The answers are evaluated by specialized committees, and to ensure transparency and integrity of the correction, the names are withheld and replaced with special numbers. For developing test items, there are two useful formats: Selected Response (SR) and Combined Response. The first format includes True-False (TF) and Multiplexed and Multiple True-false (MTF). For undergraduate and postgraduate studies, the teacher is not interested in memorizing facts, methods, and concepts, but rather that the student learns how to integrate knowledge in multiple ways to achieve

a specific goal, i.e. the student can apply the main idea according to a situation [11]. Conducting the paper test (imitation) requires financial costs, including the availability of classrooms, copies of questions, the provision of the appropriate number of monitors, cameras, etc., So is the effort teachers put into correcting test times over a specific period of time. Pandemic as well as the effort exerted by the teachers in correcting the examination times during a specific period of time. Face-to-face education is a real problem during the COVID-19, Due to the technological progress, some programs and devices have been used. It included electronic correction with accuracy and high speed, including the program (bubbles sheet), which has been widely used in Iraqi universities in the recent period [3].

٤-1-2 E-Learning

Since the invention of the computer, man has been able to adapt technology and social networks to benefit from them in all areas of life, including the field of education. Benefit from it has been expanded thanks to the tremendous progress that has occurred in the field of manufacturing software, media equipment and computers by using audio-visual means in education, and thus the increase in dependence on the Internet. Education by distance education, where it initially relied on e-mail, then expanded after progress in the world of communication and networks, and the classification of education on the presence of the teacher and the learner and communication between them or on the data used in this process. E-learning is defined as the adaptation of modern electronic means and technologies such as the Internet, video conferencing, and other educational content for the learner. And due to the increasing demand for it in the recent period to keep pace with development and expand communication and understanding between the teacher and the learner at the present time. Which has helped make education a global phenomenon by integrating educational systems, communications and resources, facilitating communication, and most importantly, the emergence of open source electronic platforms for public use [13]. Where educational computer applications are described by different names such as (e-learning, learning management system (LMS), content management systems (CMS), and virtual learning environment (VLE)) [3,15] and the different systems provide for the courses that the user can access, As well as the possibility of

communication between lecturers, students, or colleagues, through forum forums, conversations, and messages, and there are many important higher education systems for universities, including (Docebo, Dokeos, EFront, Claroline, and Moodle [16], as well as using platforms such as Facebook, Twitter, and Moodle And Blackboard as different learning platforms [2]. The e-learning environments, which depend on the location of the learner's receiving the material, are classified into real environments and virtual environments. E-learning is characterized by reducing expenses and tuition costs and contributing to enhancing the ability of the teacher to reach the largest number of learners and interact and bring different points of view closer, the possibility of accessing the academic content at any time easily and quickly as well as providing them with updated and credible academic content. Despite the many advantages of e-learning, it contains some defects or negatives, including the urgent need for a good infrastructure with technical specifications, continuous maintenance of the network, interface, and equipment, and its focus on the cognitive side without the skill aspects, as well as the poor planning of the education activities used [12,24].

٤-1-2-1 Moodle System

It is an acronym for Modular Object-Oriented Dynamic Learning Learning Management System (LMS), (object-oriented environment for standard dynamic learning), which was widely applied in the field of education in Iraq after the spread of the (Covid-19) epidemic and the almost complete closure in of all educational facilities [4]. It was created by (Martin Dnghamad), which is a platform on the Internet and can be easily accessed from the browser, open source (the possibility of modification and copying and reserved for copyright .) It is considered one of the unlimited educational means that facilitate the delivery of the scientific curriculum to the learner using the Internet (exchanging digital and systematic data without using paper) [17]. The teacher can upload the study materials, do a test, evaluate and statistics, where the interaction between the learner and the teacher is effective and highly efficient, and it is characterized by many aspects such as questionnaires, chatting, workshops, electronic magazines, surveys, recording learners' attendance at the lecture, and other features based on benefiting from technology using this program. This platform allows all participants to exchange information in any geographical

location through the synchronization mechanism (chat) as well as discussion forums (asynchronous communication) [18]. Due to the great capabilities available in this program, it can improve the learning and teaching process as well as motivate the learner and the teacher to develop their own capabilities, communication, discipline and confidence. Therefore, it has become one of the ways to improve the effectiveness of the education system, in addition to relying on electronic testing that achieves the principle of equality and transparency [20,19], since there are several factors that affect the effectiveness of using this program from the learner's point of view, including: what is related to the learner's desire to obtain information and knowledge, the ease and form of communication, the quality and quality of the information given, the results of its performance, the amount of benefit and the quality of the system. [17,19]. Moodle is not only to create a quality educational environment for the learner in terms of interaction, cooperation and communication, but also works to expand the learner's use of the Internet and solve the problem of learning difficulty. Increasing the effectiveness of education to obtain teaching results to develop learners' skills, which is one of the axes of evaluating teachers in terms of using modern means to deliver information, as well as the availability of multiple types of question formulations, whether optional, short answers, writing text, uploading pictures or charts. This is in line with the instructions of the Ministry of Education The Iraqi higher education institution, where it was directed regarding the questions of the competitive exam for admission to postgraduate studies, to be in the form of questions with a rate Not less than (60%) of the MCQ and (40%) to be text questions, according to the classification of the college. [16,15]. Moodle is not only an electronic class, but rather for setting up forums, discussions, courses, meetings, workshops outside education, etc., as it works on managing, documenting, preparing reports, and presenting the material to be displayed by various means (video, pictures, charts, etc.) and user classification [23,10]. The user can access the required data once they are uploaded to their account on the LMS and access the information anywhere across the university network in a simple and effective way to log in using their personal user ID and password [17], In addition to the many features of the program, it is characterized by security, and it is a high-quality system in the event that the hosting is secured and the program is configured correctly, it is

safe for the reliable computing infrastructure. The program allows the creation of any test design directly from the program, ensuring a variety of formatting for questions of different types, weights, and different measurement systems, with secure support for the program and preventing fraud by activating the random number feature for questions from within the specified group. The Moodle program comes with a Runner Code provider, which acts as a compiler to run the programming codes, in addition to the possibility of supporting learners with disabilities by integrating many assistive technologies such as screen readers, screen magnifiers, alternate mouse, and other technologies to increase the efficiency of the program. Moodle is written in php with SQL database. Because the system is open, so it happens from time to time, and its pages are displayed in a flat view. [20, 19]

٤-1-2-2 Google Classroom platform

E-learning management (LMS) via the Internet by creating electronic classrooms to share files between teachers and learners The Google Classroom platform service was announced in 2014 and for users of the (G Suite for Education) system, and it was developed and made available to any subscriber who has an email account on gmail without obtaining an account [9], as many educational institutions have integrated technology through the use of information and communication technology (ICT) in learning [21] . The program offers teachers the possibility to create and publish materials (photos, videos, link), invite students, assign students, discussion as well as test and benefit side in the administrative side. Among the advantages of this platform is the availability of a free program, ease of use, and better ability to communicate, interact, and feel satisfied for the learner. As for the teacher, he benefited from this platform, as an improvement was noticed in terms of developing and implementing the work plan for the lesson, and then evaluating it compared to the previous teaching methods (face to face), memorizing the lesson material, and returning to it. At any time and place, flexibility in use, whether on a personal computer or smartphone, and the inability of anyone to enter except through the class code or an invitation by the class administrator via e-mail. Entering the program for the teacher in Google Classroom, either by writing on the website (classroom.google.com) and then his email address and password, or by opening his Gmail account, and then automatically accessing Google Classroom


in the list provided, and two options appear (Join or Create a class) [21]. The training courses and workshops helped to improve the performance of teachers in making the most of all the capabilities of the program. It was widely used in Iraq after 2019 in the field of education and proved highly effective in it. Despite the advantages that are available in this program, it has disadvantages such as a specific possibility of teaching methodology, the inability to use the interfaces of this program, as well as the inability to control the behavior of learners during the lesson and weakness or Sudden interruption of the Internet during the lesson [22].

٥- The Practical side

٥-1 Research Community

In order to verify the first research hypothesis (Are there significant differences between the average scores of the applicants who took the electronic test and those who took the paper test) and the second hypothesis (Are there significant differences between the average scores of the applicants) And for the scientific and humanities majors for the applicants who have taken the electronic test and who have taken the paper test? Two independent random samples were drawn from applicants for higher studies at the University of Baghdad for the academic year 2019/2020 and for all open studies, and scientific specializations were taken separately from humanity due to the nature of the study for each type, the size of each sample amounted to (230), the first of the applicants Those who took the electronic test and the second from the applicant for the paper-based test for scientific specializations and two samples with the same value for the humanitarian specializations. And as shown in Table (1), which shows the age group of applicants falls between (30-36) years and that the majority of applicants for postgraduate studies are employed, and other data are shown below.

Table (1) the variables included in the research (percentages), for the two tests (electronic and paper), and for the scientific and humanitarian specializations.

specialty Type of		disciplines Scientific		specialties Humanitarian	
Sample size		230	230	230	230
Type of test / Variables		Electronic test	test paper-based	Electronic test	test paper-based
Sex	Females	67%	40%	41%	58%

	Males	33%	60%	59%	30%
Career position	yes	33%	63%	37%	41%
	no	67%	29%	63%	59%
Computer degree	Fulfilled	3%	4%	7%	2%
	Average	6%	15%	16%	17%
	good	34%	38%	50%	50%
	very good	48%	37%	27%	30%
	Excellent	8%	7%	1%	1%
language English degree	Fulfilled	5%	20%	27%	17%
	Average	40%	0%	53%	60%
	good	30%	57%	17%	16%
	very good	13%	23%	3%	6%
	Excellent	0%	0%	0%	1%
Advanced result	Successful	44%	55%	24%	2%
	Unsuccessful	56%	45%	76%	98%
applicants Average age for		30	36	32.9	33.16

4-2 analyzing the results

For the purpose of comparison between the results and to verify the validity of the hypotheses that were established, we performed a t-test for independent samples using the SPSS program. The results were as shown in Table (2) after the conditions and hypotheses of the test were confirmed.

Table (2) results of the admission test for the two groups (electronic and paper) for academic specializations.

type of test	Sample size	mean	standard deviation	higher value	lowest value	t value	Probability value	Statistical significance
Electronic test	230	51.498	9.96932	89	15.63	4.952	0.001	Statistically significant
test paper-based	230	45.557	15.2235	79	32			

It is evident from the data of Table (2) that the average score for the electronic test is (51.4982) with a standard deviation (9.96932), which is higher than the

average score for the paper–based test of (45.5566) with a standard deviation (15.22346). The result of t–test (4.952) with a probability value (0.001) was smaller than the level of significance (0.05). Therefore, the decision is at the level of significance (0.05). There are statistically significant differences between the average scores of the paper and electronic test in favor of the electronic test, according to Figure (١).

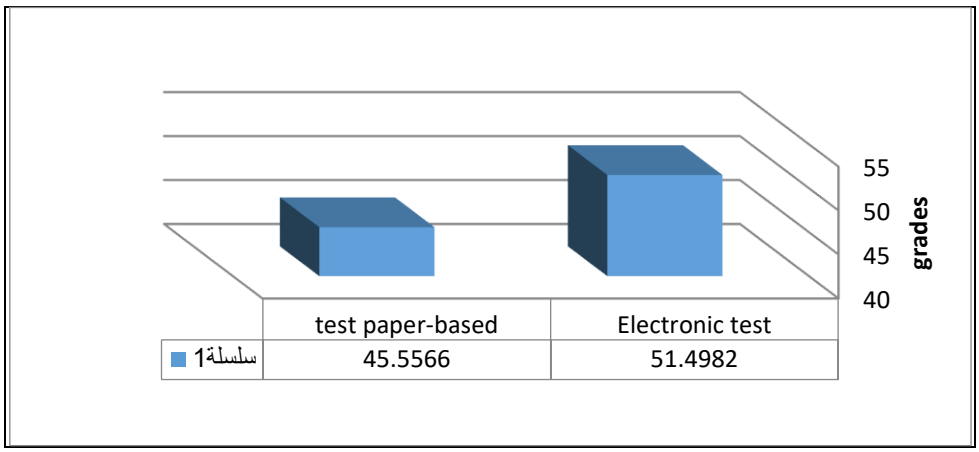

Figure (1) average for scientific studies

In order to indicate whether the degree of the applicant in computer affects the results, comparisons were made between the levels of degrees for the same specialization.

In scientific disciplines, we note that the level of applicants, regardless of the quality of the test, was good, according to Figure No.(٢) .

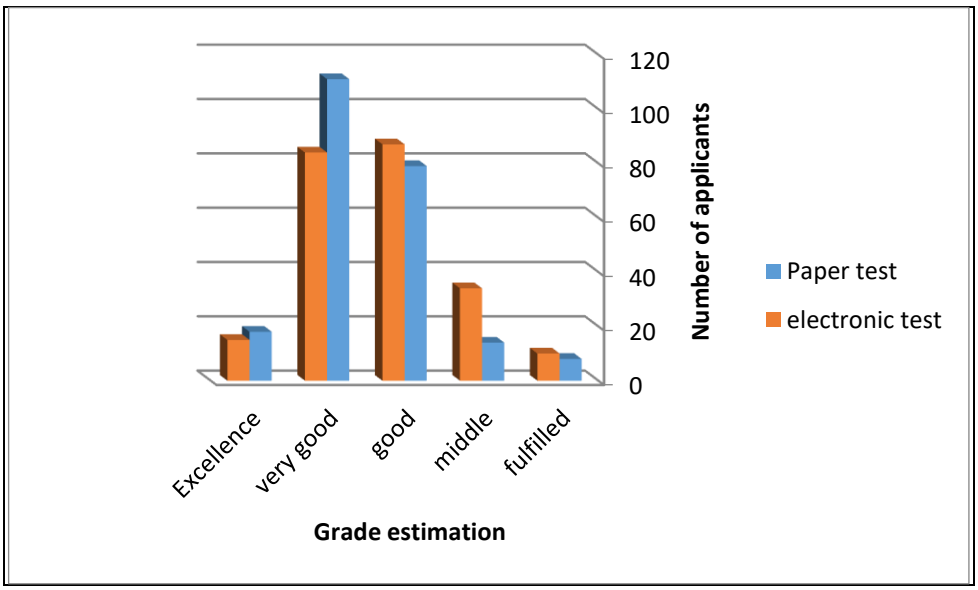

Figure (٢) Computer exam score estimates for scientific disciplines

As for the hypotheses related to the Humanitarian specialties, when two samples of each of them are drawn (230), we note from the data in Table (3) that the mean of the electronic test scores is (48.5174) with a standard deviation (14.75142), which is slightly higher than the average scores for the paper test of (45.5566) With a standard deviation (16.29777), and the value of the (t- test) reached (5.544) with a probability value (0.071), which is greater than the level of significance (0.05), and therefore at a significant level (0.05), there are no significant differences between the average scores of the electronic and paper test for humanitarian specialties as In Figure (٣), when examining the effect of the independent variables on the adopted variable.

Table (3) results of the admission test for the two groups (electronic and paper) for the humanitarian specializations.

type of test	Sample size	mean	standard deviation	higher value	lowest value	t value	Probability value	Statistical significan
Electronic test	٢٣٠	48.52	14.7514	90	17	5.544	0.071	Statistical significan
test paper-based	٢٣٠	46.48	16.2978	81	6			

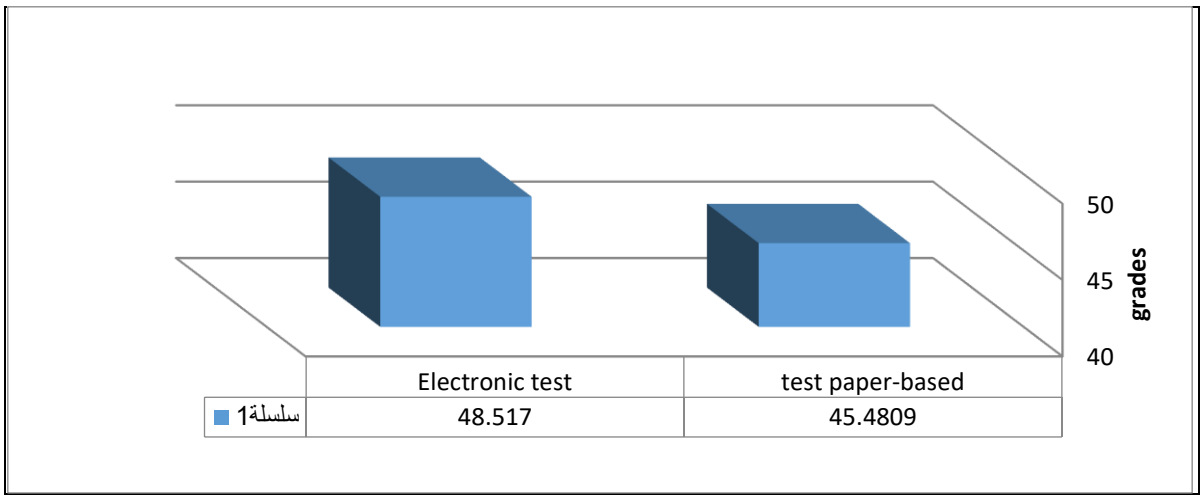

Figure (٣) Average for humanitarian specializations

With regard to the independent variable, the score of the competitive exam for applicants in the humanitarian disciplines, there is a slight

discrepancy in the scores of applicants who took the electronic exam, according to Figure No() .

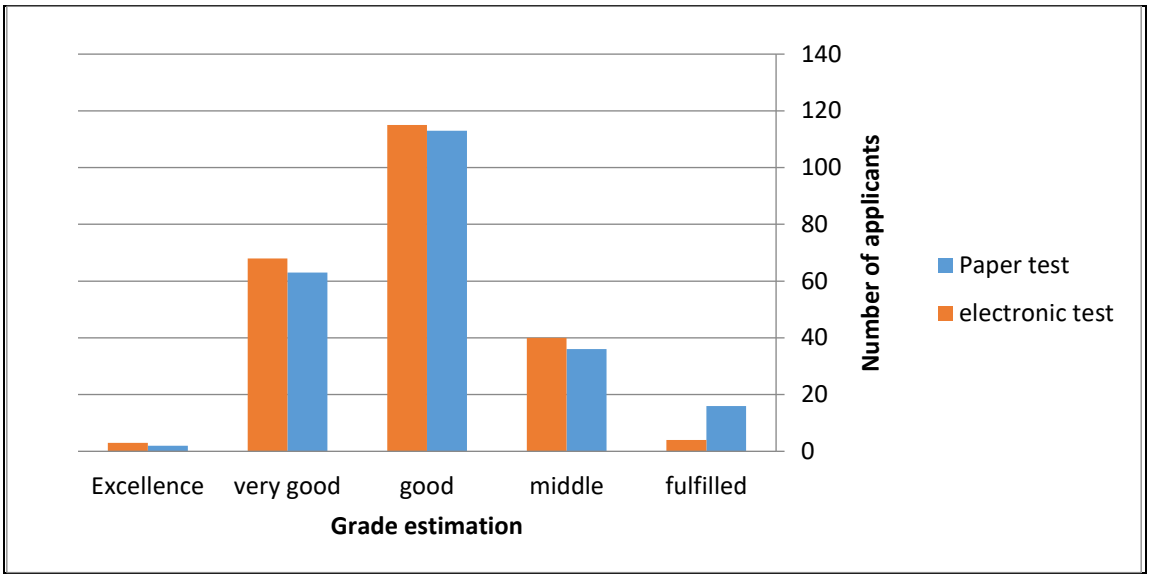

Figure (٤) Computer exam score estimates for humanitarian disciplines

Regarding the variables included in the study, it was found that the two variables (computer score and job) have a significant impact on the competitive exam score. As for the rest of the independent variables, their impact was limited.

٦- Conclusions

The use of electronic programs, including Moodle in the fields of education, contributes to increasing the efficiency of students' results in a clear way compared to the results of the paper-based test, thus reducing the time and effort in the examination as well as achieving the principle of fairness and transparency in the test results in scientific specializations. As for the humanitarian specializations, use of the electronic test did not improve Postgraduate applicant's results. Although level of the applicants was similar in degree of computer science and for all disciplines.

7- Recommendations

1. Providing the budget to support electronic means in universities (whether government support or external institutions) to prepare and train students in the initial stages, through the adoption of the

latest electronic programs in their education, coinciding with the training of faculty members, and the provision of laboratories, computers and Internet lines.

2. Serious and real adoption of modern electronic programs in undergraduate and postgraduate exams for all colleges and universities gradually to replace paper-based exams, whether it is a daily or quarterly exam.
3. .Seeking help from governmental or external agencies to build and ensure diversity of content methods for e-learning systems in line with the student's learning strategies.
4. Supporting and paying attention to computer curricula and teaching humanities from the first stage, in order to ensure maximum benefit for the student from it.
5. Preparing studies to determine the reasons for the high rates of unsuccessful applicants in the competitive exam and to develop appropriate solutions

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