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Investigating the Electronic Examinations' Quality from Faculty Members' and Students' Experiences and Perspective

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Abstract
The current qualitative and quantitative study methods intend to investigate the quality of electronic examinations and the obstacles of changing the examinations' process from the participants' experiences and perspectives. The study generates feedback to enhance the adoption and improvement of the e. examination process. Due to the COVID-19 pandemic, electronic exams help much during the education interruption. The study employed two tools to answer the study'scentraln question: "*To what extent did teachers and students reflect on the quality of electronic examinations' criteria*? They Were distributed among (n=165) undergraduates and (n=24) faculty members during 2020/2021. Findings from the e. questionnaire's SPSS and interview's content analyses indicated that most participants were satisfied with the e. exams' flexibility, ease of use, clarity, fairness in grading, and feasibility in time, efforts, and money. Concerning challenges, few undergraduates complained about the Network problems, e. cheating, and the number of attempts to answer e. exams. Few faculty members have complained that some questions require different preparation methods, e. exams increase students' scores without much effort. On the other hand, it opened the door for malpractices. To conclude, the results revealed that E. examinations are of high quality; they were responsible for undergraduates' high performance, saved effort and time more than the in-class exams. The study recommends future research exploring families, especially parents, about their experience with kids regarding the quality of online examinations during the COVID- 19 pandemic. Moreover, research is needed to address how teachers deal with the validity and reliability of the electronic exams
Keywords: critical reflection, electronic examination quality control, electronic versus traditional examinations, traditional examination

Introduction

The information technology explosion has changed the globe and absorbed all people's life's aspects as time, attention, behavior, perceptions, attitudes, relation, business, and study. Li & et al. (2014) suggested that technology has become an integral part of all aspects of education, broadly covering curriculum planning, content development and delivery, assessment, program evaluation, and communication among learners, instructors, and institutions. It examines how much people are willingly involved in the rapid growth around them and with no chance and choice to stop and think about this technology or to stand still. Examinations are the primary tools in any education system used to test the knowledge, learning capabilities, and progress in a specific program.

Therefore, it is inevitable to have a fair and efficient examinations system that varies from the traditional methods, which have problems and many complications. Some voices criticized a paper-based exam due to its low quality. The revolution in technology reduces both teachers' and students' examination efforts in many ways (Nandini & Maheswari, 2020). Spending much time following the traditional ways to accomplish jobs, studying, or doing an exam can result in some challenges. Teachers and students are situated in this world's heart and gradually shift from the traditional manual exam environment to a new smart one.

Problem Statement

The researchers observed that some faculty members and undergraduates see that the conventional exam systems work well. Therefore, they wonder why to adopt new complicated ways that need much effort to master, and this observation guides the researchers to explore the participants' satisfaction/ dissatisfaction and acceptance/rejection degree toward the electronic examinations to suggest reducing or increasing the spread of the traditional commonplace exams and accelerating the electronic examination system.

The following two questions are guided the current study:
1. To what extent did teachers and students reflect on the quality of electronic examinations' criteria?
2. What were the electronic examinations' obstacles faced by the faculty members and undergraduates?

Significance of the Study

The current study has significant impacts due to the time in which it carries out. Furthermore, it differs from the previous studies because it carries out in a different challenging circumstance the Covid-19 pandemic, which calls for a new study to investigate the effectiveness and the quality of electronic examination during the complete lockdown. Lockdown affects mainly the students who used to attend live classes, meet their beloved classmates, and open social life adds to all; they were prevented from conducting examinations in their typical environment.

Moreover, the significance of this study appears in its role in highlighting the quality of the online examinations processes, and if it is more beneficial than the conventional process in terms of
1. feasibility in saving time and efforts and lowering the financial cost of printing and copying examinations' sheets;
2. Increasing efficiency;

3. Ensuring the easiness, clearness, fairness, and accuracy of exams.

The Objectives
To meet the aims of the study, the researchers try to:
1. Investigate the quality of electronic-exam compared with the conventional exam system in terms of usability, ease and flexibility, clarity, fairness, and feasibility. As a result, universities will benefit from the results and the other educational institutions locally and abroad.
2. Explore the obstacles and difficulties encountered by faculty members and undergraduates while carrying e- exams, then suggest solutions.
3. recommends research for improving electronic- exam quality regarding the research results.

Contributions
The study has theoretical and practical benefits:

First, theoretically, it reviews and highlights the theories and concepts of online examination and discusses the advantages and disadvantages of online examinations. Second, practically, the study shed light on the paper- pen's exam compared to online exams' productivity, in terms of feasibility (saving time, reducing cost, teachers' and students' efforts, b) Online exams' role in easing the accessibility to a wide range of students anywhere and anytime, c) It is easy for teachers in carrying periodically online exams to measure and follow up their students' progress without putting much effort into correcting exams, d) Helps students in getting quick and satisfying results compared with paper pens' exams, who may lose marks due to their unreadable handwriting, e) The challenges encountered by the users during e-examinations proposes a future improvement to the electronic examinations. Finally, the study generates feedback to enhance the adoption and improvement of the e. examination process. Electronic exams help much during the education interruption due to the CORONA Virus.

Literature Review
The traditional Examinations
The traditional pen-paper procession begins with extended discussions on paper creation. Then, the questions must be handwritten/ typed, proofread, and again checked for repetition. Once pay off in the form of a beautifully designed paper, do not take a sigh of relief, and now is when the genuine efforts begin. Get set to find the invigilators and space for conducting the exams. Straining, stressing, draining, isn't it? What if there is a solution? Undoubtedly, there is a solution, and it is known world-over as the most effective way to conduct examinations, which is called electronic examinations.

Electronic Examination
Online examination is an electronic examination with a fast feedback system used by educational institutions to improve the quality of instructions and results by having a supervised measure of outcomes for their students' self-paced learning environments. However, it also had limitations on dependency on Internet service quality, leaving both the proctor and the examiners unable to use the system.

Oprandi (2018) carried out research that asks "*Why are universities considering electronic exams*?" Arguably the main reason is that electronic examinations reduce, and in many cases altogether remove, the need for paper handling. As a result, they are usually far more efficient for passing around grades and moderating marking. The other reason is that students use word processors throughout their studies, but one of the few times we expect them to handwrite is under examination conditions.

Muna and Abdullatif's (2017) study shows that the (LMS)dashboard page enables teachers to show previous exams results anytime he opens the platform and could easily make use of and manage the previous exam. In addition, the exam's page allows the admin to display the last exam's marks that have been stored each time a student gives an exam.

Molenaar and Campen (2017) examined how the dashboards were employed during lessons. The results indicate that teachers consult the dashboard on average 8,3 times per lesson, but they found q great variation among teachers. Teachers activate existing knowledge about the class and students to interpret dashboard data.

Electronic Versus Traditional Examinations

With the growing development rate of Internet and network technologies, many organizations are migrating from a manual operation system to a computer-based system. Academic organizations are not an exception, as many of them are now shifting to an online exam system that gives the opportunity to create, process, manage, publish, and deliver it.

Andersen et al. (2020) see the traditional exam approach as an advantage over the e. exam. It gives students flexibility in expressing their thoughts in an accessible form, experimenting and visualizing their approaches while working out their solutions.

Electronic Examination's Quality Control

Sinchak (2004) stated that computer hacking consistently links with e. exam quality, in which the viruses are actively seeking to infect computers. Moreover, when a virus has gained entry into a system, the invaded computer can turn into a virus distribution center. Thus, cheating is always a significant issue.

Computer-based testing has multiple built-in features that limit cheating. Many security measures have to take place, such as:

1. Close the browsers – Not allowing test takers to use tools like Print Screen or the ESC keys prohibiting screenshots or store it to another screen to change their replies.
2. Double-proctor login – Requires a test proctor to log in precedes a user opening a test.
3. Online-proctor – An administrator can watch a candidate test in real-time via webcam to ensure maximum quality control.
4. Computer-based testing gives administrators a chance to create multiple test versions or "forms," significantly reducing test content chances from being pre-exposed.

Critical Reflection
An analysis of a critical reflection can occur at any point and, therefore, is helpful, particularly in the development and inquiry-oriented programs (i. e: learning and insights can be drawn from, fed back in, and across programs. Farrell (2012) indicated that teachers' professional development reflective practice depends on the notion that teachers can systematically develop their instruction by reflecting on their teaching using suitable tools that support their needs.

 Previous Studies
Wibowo et al. (2016), from Australia, piloted academic staff and students about their view of e-exam benefits and challenges. The finding revealed that they are optimistic about adopting electronic exams if the system is improved. They believe in technology's impact on supporting learning and education and see e-exams as an innovation for learning and teaching in higher education.

A further study from Saudi Arabia carried by Al Amri (2008) explored and compared computer testing in the L2 reading context and the impact of test-takers characteristics, i.e., computer familiarity, computer attitude, testing mode preference, and test-taking methods on students' progress one. A hundred sixty-seven Saudi medical students participated in this study. The study used quantitative and qualitative instruments to gather data. They found a significant difference between the mean scores on both modes; none of the factors examined influenced students' performance when doing the computer-based tests in their study.

Fluck, Adebayo, and Abdulhamid (2017) from Nigeria compared Nigeria and Australian universities' electronic examination problems. The Nigerian Students expressed their negative opinions about electronic examinations due to their scariness and unfamiliarity with the technology, automated measurement, and a lack of knowledge about the methods of e-examinations. Comparing the two institutions in Nigeria and Australia shows e-examinations implemented to select students for university courses and assess them once they enrolled. There is systematic adoption for university entrance merit selection in Nigeria. For future research, they pointed to the future proposition procedure as a web-based strategy for a virtual machine entering into candidates' computers at the start of each e-examination.

 Vijaylaxmi, Emmi, & Gajanan (2015) criticized the traditional exam system that required much human effort and a pile of stationery for carrying it. Even if only one student is sitting for an exam, a group responsible for conducting the examination must do all the formalities. With this proposed system, candidates can answer their test digitally and submit the digital answer paper to the server directly from where it accesses the human evaluation system or automatic evaluation system. Nuha, Wills, and Wald (2018) interviewed experts in Saudi Universities about the factors that affect accepting E-assessment to give the academic institutions a clear image before adopting electronic assessment. They employed a Model of Acceptance of E-evaluation and a questionnaire distributed to all academics in Saudi universities. Responses were analyzed using Structural Equation Modelling (SEM). The findings revealed that age positively and directly affected the relationship between Attitude and Behavioral Intention. In contrast, it has a low influence on the subjective norm and behavioral intention's relationship.

According to Rizwan (2013), who created an E-questions bank, he automatically generates the question paper and proposes a subjective E-examination plan for King Abdulaziz University's faculty members. The results indicated that faculty members' main problems are due to manual exam setting and assessment because a) It was a tedious process to set exam papers and quizzes every semester, b) It needs much time, cost, and resources to set and assess the examination papers, especially if the class strength is more significant than thirty, c) The paper-based examinations are currently scanned to convert them electronically for the review of The Accreditation Board for Engineering and Technology (ABET). According to Ayat & Randa (2019), students are now willing to evaluate the teaching technique used in the classes, review the assignments questions, and discuss the exam level.

The Method
This research is a mixed-methods design that intends to investigate the quality of the E. examination through an inquiry that is associated with qualitative and quantitative forms to strengthen the study, which is more remarkable than either qualitative or quantitative research Creswell (, 2009, p. 23).

Participants
The following two groups participated in the present study:
Case 1: It consists of (n=165) undergraduates majoring in Computer Science College in Zulfi, Majmaah University, KSA. They have enough basic knowledge of using general applications and online exams.
Case 2: It consists of (n=24) faculty members at the computer science dept., who are skilled and with enough experience in dealing with e. exams.

Instruments
Instrument 1
The Students/ perception online- questionnaire distributed among the students enrolled in computer science). The purpose was to gather the students' reflections on the ongoing exam techniques. The questionnaire consists of five Likert scales. The study asked the students to respond to the (n=5) exam's dimensions; each consisted of (n=8) closed-ended opinions' statements. They covered the following areas: a) easiness of checking in to the exams', b) clearness, c) feasibility, d) fairness of exams' marks, and finally, d) the participants' challenges while preparing or carrying out the exam. This survey may help researchers in future academic publications in the same field.

Instrument 2
The teachers' online interviews followed Laakmann's (2010) procedures for carrying "on-site Interview. Thus, the Interview consisted of the exact dimensions of the students' e-questionnaire.

The Procedures
The study underwent the following activities: (a) designing an electronic questionnaire and interviews, (b) testing the validity of the tools, (c) distributing and collecting the data, (d) finally, analyzing data using the SPSS program.

Validity and Reliability of the Statements Questionnaire

In this study, the validation procedures employed three types of validity (i.e., face, content, and construct) will describe. Face validity is concerned with how a measure looks. In other words, it relates to its design, reasonableness, and workability. Given these predictions, the pilot study's referees confirmed the overall accuracy of the questionnaire. In terms of the content validity, the pilot study's jury members also maintained that the questionnaire had covered all the aspects of the research questions and dimensions in a systematically relevant fashion. Finally, the jury members also reported a consistency between the theoretical notions and the intended measuring device for the construct validity.

Statistically, according to classical test theory, the maximum validity for a test is the square of the reliability; accordingly, the subjective validity value of the questionnaire statements is:

Table 1. *Validity and Reliability value of the questionnaire statements*

No	Dimensions	Number of Statements	alpha-Cronbach coefficient	Validity
1	Dimension1	8	0.954	0.910
2	Dimension 2	8	0.850	0.723
3	Dimension 3	8	0.905	0.819
4	Dimension 4	8	0.938	0.880
5	Dimension5	8	0.912	0.832
	For the whole questionnaire	40	0.956	0.914

Source: Prepared by the researchers from data (2020)

Table 1. shows that the stability (alpha-Cronbach coefficient) for the first dimension was (0.954), and the coefficient of validity was (0.910). While the coefficient of reliability for the second dimension was (0.850), and the coefficient of validity was (0.723). The third dimension's reliability coefficient was (0.905), and the validity coefficient was (0.819). While the coefficient of reliability for the fourth dimension was (0.938), and the coefficient of validity was (0.880). The fifth dimension's reliability coefficient was (0.912), and the validity coefficient was (0.832). While the coefficient of the questionnaire reliability was (0.956), and finally, the coefficient of validity was (0.914)

Depending on the previous values of the coefficient of reliability and validity, this scale gives the exact results if used more than once under similar conditions. Moreover, this means the reliability and validity of the questionnaire for measurement.

Methods of inferential data analysis

The study uses a single sample T-test (since the sample is greater than 30, it does not need to test the normalization of data for a normal distribution) to determine the extent of the differences between the sample study respondents' answers and the statistical population for the five dimensions around (An Investigation of Electronic Examinations' Quality from the Faculty Members' and Students' Experiences and Perceptions). The value used (3.50 population average).

Table 2. *One-Sample T-Test*

Dimensions	One-Sample Test					
	Test Value = 3.5					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
					Lower	*upper*
1.The Ease of use & flexibility	13.647	164	.000	.78333	.6700	.6700
2 Clarity	8.037	164	.000	.43636	.3292	.3292
3. Fairness	8.118	164	.000	.48636	.3681	.3681
4. Feasibility	10.042	164	.000	.60530	.4863	.4863
5. Challenges	-1.016	164	.311	-.07273	-.2141	-.2141

Table 2. shows the (One-Sample T-Test) tested the statistically significant relationship between the E-exam's Ease of use and flexibility, Clarity, Fairness, Feasibility, Challenges, and the respondents' answers. The P-value calculated by the SPSS program is (0.00). The previous value is less than the significance value (0.05), then reject the null dimensions. In contrast, the P-value calculated by the SPSS program is (0.311). This value is significant than (0.05). Therefore, the dimension's null was accepted.

4.0 The Results

This section divides into two parts: the quantitative and quantitative data result as follows:

4.1 Results from the Students' Questionnaire

Demography variables' Results

Analysis of the demography variables depends on measuring frequencies and finding percentages for them. The study presents tables and graphs for more clarification with commentary to clarify these indications. Analyzing personal data aims to know the community's specific characteristics to confirm its various qualitative characteristics. The weighted arithmetic mean and standard deviation of the questionnaire's statements help determine the respondents' opinions and dimensions.

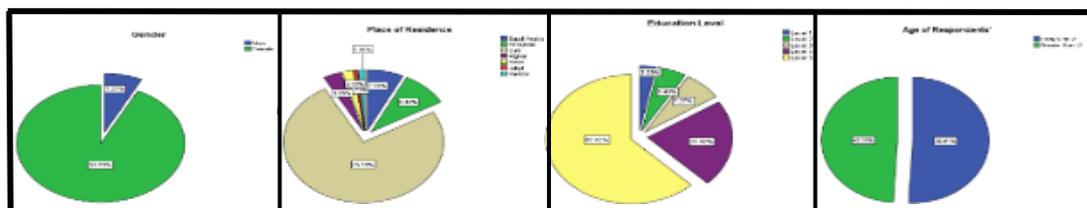An analysis of the demography variables of the sample according to their different characteristics:

Figure 1. shows that (92.7%) of the study sample were (n=153) of the total sample were female; it also shows the participants' gender, age, and place of residence variables as follows:

    1. (7.3%) participants were males; their number was (12), whereas (92.7%) were female

2. (50.9%) of the sample age was between 17 and 21 years, their number was (84) of the total population, while (49.9%) of the sample age was older than 21 years and their number was (81)
3. (62.4%) of the students' academic level is 5, they were (n=103) of the total population, while (21.8%) level 4, (7.3%) level 3, (5.5%) level 2, and (3.0%) from level 1.
    The distributions of the study community are as follows: (75.2%) of the respondents in this survey live in the following cities: Zulfi (9.5%) from Majmaah (15.3%) from Alghat, Jalajil, and Suider.

Weighted Arithmetic means and Standard Deviation
The following are the results of calculating the weighted arithmetic mean and standard deviation of the five dimensions to determine the response trends:

4.1.1 The First Dimension: The Ease of use and flexibility
Table 3. *The Weighted Arithmetic mean and Standard Deviation for The (Ease of use and flexibility* dimension's statements):

Dimensions	Weighted Arithmetic mean	Standard Deviation	Opinion trend to Acceptances	Ranking
1. E. exam is easy to use in registration from the first login.	4.32	0.779	V. High	3
2. The interface of E. exam software is straightforward.	4.34	0.815	V. High	2
3. The E. exam is easier to use more than a paper's pen exam.	4.31	0.867	V. High	4
4.E. exams, multiple choices, and matching questions are easy.	4.21	0.861	V. High	7
5. E. exam is flexible in use.	4.35	0.846	V. High	1
6. The E. exam's environment is comfortable.	4.30	0.821	V. High	5
7. E-exams have flexible tools that ease the evaluation of my knowledge.	4.28	0.861	V. High	6
8. exam is unstressed.	4.16	0.926	High	8
The ease of use and flexibility dimension	4.28	0.770	V. High	

Table 3. shows that the weighted arithmetic means of the study sample's responses of:
1. The first statement was (4.32) with a standard deviation (0.779), and this value indicates that that most of the sample's individuals strongly agreed with this statement.
2. The second statement was (4.34) with a standard deviation (0.815), and this value indicates that most of the sample's individuals strongly agreed with this statement.
3. The third statement was (4.31) with a standard deviation (0.867), and this value indicates that that most of the sample's individuals strongly agreed with this statement.
4. The fourth statement was (4.21) with a standard deviation (0.861), and this value indicates that most of the sample's individuals strongly agreed with this statement.
5. The fifth statement was (4.35) with a standard deviation (0.846), and this value indicates that that most of the sample's individuals strongly agreed with this statement.
6. The sixth statement was (4.30) with a standard deviation (0.821), and this value indicates that that most of the sample's individuals strongly agreed with this statement.

7. The seventh statement was (4.28) with a standard deviation (0.861), and this value indicates that most of the sample's individuals strongly agreed with this statement.
8. The eighth statement (E. exam is not trustful) was (4.16) with a standard deviation (0.926), and this value indicates that most of the sample's individuals agreed with this statement.

To sum up, the weighted Arithmetic mean of the responses of the study sample for (The Ease of use and flexibility dimension) was (4.28) with a standard deviation (0.770), and this value indicates that most of the individuals in the sample, strongly agreed on this the ninth statement.

4.1.2 The Second Dimension: Clarity
Table 4. The Weighted Arithmetic mean and Standard Deviation for the (Clarity dimension's statements)

Dimensions	Weighted Arithmetic mean	Standard Deviation	Opinion trend to Acceptances	Ranking
1. E- exams are ambiguous.	3.54	1.197	High	8
2. E- exams are accurate, unlike paper-pen's exams.	3.94	1.022	High	6
3. E- exams' questions are straightforward.	4.15	0.816	High	2
4. E- exams' questions' types limit my ability.	3.62	1.128	High	7
5.E- exams' questions' types are understandable.	3.95	0.949	High	5
6. I enjoy online exams designs. They are attractive.	4.08	0.956	High	3
7. The clarity of Online exam questions evaluates my actual performance.	4.00	0.969	High	4
8. The clarity of the exam leads me to get better grades.	4.21	0.894	Very High	1
Clarity dimension	3.94	0.697	High	

Source: Prepared by the researchers from data (2020)

Table 4. shows that the weighted arithmetic means of the study sample's responses of:
1. The first statement was (3.54) with a standard deviation (1.197), and this value indicates that most of the sample's individuals agreed with this statement.
2. The second statement was (3.94) with a standard deviation (1.022), and this value indicates that most of the sample's individuals agreed with this statement.
3. The third statement was (4.15) with a standard deviation (0.861), and this value indicates that most of the sample's individuals agreed with this statement.
4. The fourth statement was (3.62) with a standard deviation (1.128), and this value indicates that most of the sample's individuals agreed with this statement.
5. The fifth statement was (3.95) with a standard deviation (0.949), and this value indicates that most of the sample's individuals agreed with this statement.
6. The sixth statement was (4.08) with a standard deviation (0.956), and this value indicates that most of the sample's individuals agreed with this statement.

7. The seventh was (4.00) with a standard deviation (0.969), and this value indicates that most of the sample's individuals strongly agreed with this statement.
8. The eighth statement was (4.21) with a standard deviation (0.894), and this value indicates that most of the sample's individuals agreed with this statement.

To sum up, the weighted arithmetic means of the individuals for the study sample for the (Clarity dimension) was (3.94) with a standard deviation (0.697), and this value indicated that most of the individuals in the sample agreed with the second dimension's statements.

4.1.2 The Third Dimension: Fairness:

Table 5. *The Weighted Arithmetic mean and Standard Deviation for (Fairness dimension's statements*

Dimensions	Weighted Arithmetic mean	Standard Deviation	Acceptances	Ranking
1. I like the E-exam; It avoids any unreadable handwriting.	4.26	0.903	Very High	1
2. I feel satisfied with my E- exam grade; it is fair.	4.11	0.950	High	2
3. E- exam reduced students' cheating chances.	3.73	1.123	High	7
4. The E- exam provided me with my actual grades.	4.08	0.893	High	4
5. I feel fear during E-exam.	3.62	1.207	High	8
6. The E- exam covers all the course components.	3.95	0.958	High	6
7. I am convinced with the E- exam's fairness	4.10	0.885	High	3
8. I felt that E- exams are fairer than paper's- pen's exam.	4.05	0.974	High	5
The fairness dimension	3.99	0.770	High	

Source: Prepared by the researchers from data (2020)

Table 5. shows that the weighted arithmetic means of the study sample's responses of:
1. The first statement was (4.26) with a standard deviation (0.903), and this value indicates that that most of the sample's individuals strongly agreed with this statement.
2. The second statement was (4.11) with a standard deviation (0.950), and this value indicates that most of the sample's individuals agreed with this statement.
3. The third statement was (3.73) with a standard deviation (1.123), and this value indicates that that most of the sample's individuals agreed with this statement.
4. The fourth statement was (4.08) with a standard deviation (0.893), and this value indicates that most of the sample's individuals agreed with this statement.
5. The fifth statement was (3.62) with a standard deviation (1.1207), and this value indicates that most of the individuals in the sample, agreed with this statement.
6. The sixth statement was (3.95) with a standard deviation (0.958), and this value indicates that that most of the sample's individuals agreed with this statement..

7. The seventh statement was (4.10) with a standard deviation (0.885), and this value indicates that most of the sample's individuals agreed with this statement.
8. The eighth statement was (4.05) with a standard deviation (0.974), and this value indicates that most of the sample's individuals agreed with this statement.

To conclude, the Weighted Arithmetic mean of the individuals for the study sample for the Third Dimension (Fairness dimension) was (3.99) with a standard deviation (0.770), and this value indicates that most of the individuals in the sample agreed with this dimension.

4.1.4 The Fourth Dimension: Feasibility Results:

Table 6. *Weighted Arithmetic means and Standard Deviation for (Feasibility dimension) statements:*

Dimensions	Weighted Arithmetic mean	Standard Deviation	Opinion trend to Acceptances	Ranking
1. The E- exam reduces the time of tests.	4.04	0.913	High	7
2. The E- exam gives me a quick result. It lessens waiting's stress.	4.28	0.889	Very High	1
3. E- exam reduces the boring manual exam routine.	4.25	0.858	Very High	2
4. An E- exam saves my efforts.	4.16	0.910	High	5
5. E-exam is economical; it saves my time.	4.23	0.846	Very High	3
6. E- exam helps me to behave positively toward the exam's system.	4.16	0.850	High	4
7. During the E-exam, I have not encountered any problems.	4.05	0.955	High	6
8. The short time given at an online exam builds my quick-thinking ability.	3.67	1.160	High	8
Feasibility dimension	4.11	0.774	High	

Source: Prepared by the researchers from data (2020)

Table 6. shows the weighted arithmetic means of the study sample's responses of:
1. The first statement was (4.04) with a standard deviation (0.913), and this value indicates that most of them agreed with this statement.
2. The second statement was (4.28) with a standard deviation (0.889), and this value indicates that most of the sample's individuals agreed with this statement.
3. The third statement was (4.25) with a standard deviation (0.858), and this value indicates that most of the sample's individuals agreed with this statement.
4. The fourth statement was (4.16) with a standard deviation (0.910), and this value indicates that most of the sample's individuals agreed with this statement.
5. The fifth statement was (4.23) with a standard deviation (0.846), and this value indicates that most of them strongly agreed with this statement.
6. The sixth statement was (4.16) with a standard deviation (0.850), and this value indicates that most of them agreed with this statement.
7. The seventh statement was (4.05) with a standard deviation (0.955), and this value indicates that most of them agreed with this statement.

8. The eighth statement was (3.67) with a standard deviation (1.160), and this value indicates that most of them agreed with the fifth statement.

In conclusion, the weighted arithmetic means of the study sample's responses to the second Dimension (Feasibility dimension) was (4.11) with a standard deviation (0.774), and this value indicates that most of the study's participants agreed with the first dimension.

4.1.5 The Responses to the Fifth Dimension: Challenges:

Table 7. *Weighted Arithmetic means and Standard Deviation for the Challenges dimension's statements:*

Dimensions	Weighted Arithmetic mean	Standard Deviation	Opinion trend to Acceptances	Ranking
1. The system logged me off before finishing the exam.	3.21	1.327	Medium	7
2. When I encountered network problems during E- E-exam, the test was postponed or canceled.	3.52	1.045	High	3
3. Some students may use e. cheating during an e- exam.	3.50	1.069	High	4
4. Sometimes, I encountered malware during an e- exam.	3.04	1.244	Medium	8
5. During an e- exam, students may look at another computer or tour the Internet.	3.24	1.231	Medium	6
6. Some e. exams have only one attempt to answer.	3.99	1.027	High	1
7. During online exams, some messages popped up and interrupted me.	3.27	1.254	Medium	5
8. 8Sometimes, it was not easy to respond to challenge questions.	3.64	1.083	High	2
Challenges dimension	3.43	0.920	High	

Source: Prepared by the researcher from data (2020)

Table 7. shows that the weighted arithmetic means of the study sample's responses of:

1. The first statement was (3.21) with a standard deviation (1.327); this value indicates that most of them were neutral with this statement.
2. The second statement was (3.52) with a standard deviation (1.045); this value indicates that most of them were agreed with this statement.
3. The third statement was (3.50) with a standard deviation (1.069), and this value indicates that most of them were agreed with the third statement.
4. The fourth statement was (3.04) with a standard deviation (1.244); this value indicates that most of them were neutral with this statement.
5. The fifth statement was (3.24) with a standard deviation (1.230); this value indicates that most of them were neutral with this statement.
6. The sixth statement was (3.99) with a standard deviation (1.027); this value indicates that most of them were agreed with this statement.
7. The seventh statement was (3.27) with a standard deviation (1.254); this value indicates that most of them were neutral with this statement.

8. The eighth statement was (3.64) with a standard deviation (1.083); this value indicates that most of them were agreed with this statement.

To sum up, The Weighted Arithmetic mean of the participants for the study sample for the fifth Dimension (Challenges dimension) was (3.46) with a standard deviation (0.910); this value indicates that most of them were agree with the Fifth Dimension.

4.2 Results from the Teachers' Interview

An analysis of the demographic variables of the sample according to their different characteristics:
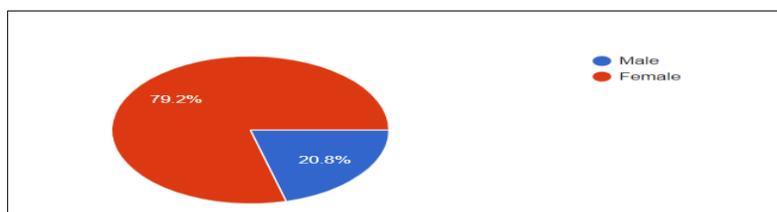
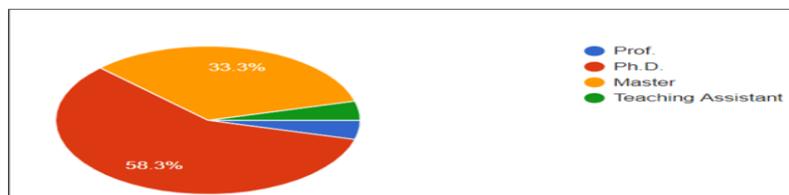*Figure. 2* The Descriptive statistics of the Participants' Gender

Figure 3. The Interview Descriptive statistics of the Participants' Academic Ranks

The teachers' interviews' results answer the two study questions based on the twenty-four interviewees' overall impressions of the Interview questions based on five dimensions. The first question: To what extent did teachers and students reflect on the quality of electronic exams' criteria?

The answer to the first question extracted from the interview dimensions is as follow:

4.2.1 Responses to the First Dimension: E. exam is easy and flexible:

There were twenty-four (n=24) teachers who participated in the Interview. Fifteen of them (63%) favored online exams and agreed upon this dimension. They stated that the E. exam system is straightforward, automated correction, easy to write, and correct. Some believe that it is a solution in the case of attending and carrying in physical classes.

Moreover, teachers thought the online examinations' questions were not complicated because they are short, like matching, true, and false (MCQs) questions. Others assumed that it is incredibly convenient because some questions requiring the highest skills cannot be put in one place, specific to science majors and scientific disciplines. Others see it as more secure, and it saves time and money for both students and the administration.

(29%) of the teachers disagreed regarding the negative responses because they thought it could prepare differently. Some said the online exam is easy and flexible, but there are chances

of cheating and malpractices. Some pointed out that online exams are not easy and flexible to use. Whereas (8%) were neutral.

4.2.2 Responses to the Second Dimension: E. exam fair in distributing grades and assessing students' performance:

Ten teachers out of twenty-four supported this dimension (42%) and agreed that online examination is fair and it has many suitable mechanisms. Another said yes because some platforms such as Blackboard (Bb) contain essential assessment tools that evaluate students' performance. Another saw it is fair and helps much in fighting covid-19. In contrast, thirteen teachers have a different opinion (54 %). They do not think so for some subjects, a participant answered, I guess no because students can guess the answers if the exam is multiple choices. Some see it challenging to assess students' performance online, as they experience stress, low connectivity, family pressures, and noise. Another answered, "No," I beg to differ because the questions' nature is objective only. Their correction is electronic and fair, leading to heightening the students' results without much effort. Another reflected: *"Not appropriate"* because the place where the exam held is not entirely fitting. The final response assumed that it is not fair to assess students' performance. One teacher (4%) was neutral.

4.2.3 Responses to the Third Dimension: The online exams clarity

This dimension gained more support from ten teachers (41.66%), who stated that e. exam eased student analysis; they are all together. Another said: "I think it helps in analyzing students' results based on a standard voluntarily scoring system (CVS). While nine teachers (37.5%) disagreed, assuming that interpreting students' results is a big challenge. Some disagreed with that idea; others said: they were unbelieved in the online exams, only (20.83%) did not respond.

4.2.4 The fourth interview dimension answers the study's second question:

What were the electronic examinations' obstacles encountered by the teachers and the students? The positive and negative responses toward this dimension were equal; eleven teachers (45.80%) stated that they did not face any obstacles, except Internet connection, which is essential in this regard.

On the other hand, the additional eleven (45.80 %) of the interviewees faced the following obstacles: the questions system is restricted, some of the available questions' methods do not appear to the student in the required form, connection problems, late students, difficulty in setting the test, e. exam lack of reliability, validity, and objectivity, they cannot detect cheating, I am not sure exactly how it conducts. Other related obstacles to the Internet issue, laptop or desktop is not available for all students; the mobile phone does not support math questions. The Internet is not helping sometimes, and the students do not motivate their teachers. Lousy internet connection is the biggest problem for both teachers and students—network problems. The internet connection does not help at all, and if the examination carries in the university, there will be little chance of cheating. Whereas two were neutral (8.40%)

4.2.5 Responses to the Fifth Dimension: Roles that Electronic Exams Play in Improving the Quality of Learning Outcomes:

The final dimension is an open question asking for the interviewees' opinions about online exams' significant role in improving learning outcomes. (45.80 %) they were positively reacted to this dimension. They answered "*yes*" if it was attached and linked with learning outcomes;

another said sometimes. Others believed it could, if conducted in the right way, but it is not like face-to-face outcomes. Whereas, (37.60%) have opposite and varied opinions as follow*:" I do not think, to some extends, if it consists of sets of questions, if it measures and assesses all the skills in standardized tests, then it can help to achieve the targeted learning outcome"*. Others answered "*No"; even online teaching does not improve the educational process"*. Finally, another opinion says: No, but if it is applied on some tests, not on all of them. Six of the interviewees (16.60%) gave no comments.

Discussion and Further Research
The teachers' and students' responses to the interview and closed-ended e. questionnaire provide further insights into how they perceive the electronic exam process. The students report positive responses. For example, they agreed it provided them with new experience, the new comfortable exam environment lessens their stresses, it was easy to use and flexible. Moreover, the most significant part about the electronic exam system was economical in saving time, and money, unlike the in-class exam, it does not require much effort to prepare or administrate it as stated by teachers.

Compared to the previous studies, the current study results obtained from the questionnaire and the interview demonstrated the participants' complete satisfaction with electronic exams' quality in terms of usefulness, ease, flexibility, fairness in distributing scores of the assignment, tests, and it was economics.

In contrast, the present study's results disagreed with Fluck, Adebayo & Abdulhamid's (2017) analysis, in that the Nigerian students expressed their negative opinions about electronic examinations due to some students' scarceness and unfamiliarity with the technology, automated measurement, and a lack of knowledge about the methods of e-examinations. Concerning the obstacles, the results agree with Wibowo et al., (2016) in adopting electronic exams if the system is improved and developed.

Regarding the challenges faced by the participants during the electronic exam, few undergraduates complained about the Network problems, e., cheating, and the number of attempts to answer e. exams. Additionally, few faculty members have complained that some questions require different preparation methods, e. exams increase students' scores without much effort. Nevertheless, on the other hand, it opened the door for malpractices.

Further investigations have to be devoted to exploring students' families, especially parents, about their opinions regarding the impact of online examinations on their boys and girls during the COVID- 19 pandemic period. In addition, further research is needed to address the validity and reliability of the electronic exams**.**

5.0 Conclusion
Studies investigating the quality of electronic examinations gain much interest. First, it seeks to make the faculty members and undergraduates feel its flexibility, easiness, and fairness. Second, it aims to make the online examination more secure and feasible. This paper discussed the undergraduates' and experienced faculty members' opinions to provide insights into online exam modality's influences on higher education. It also establishes a research interest in online exams'

quality from the participants' experiences and perceptions that help improve the online exam environments when carefully designed for pedagogically appropriate reasons.

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 Appendices
Appendix A: Students' questionnaire link: https://forms.gle/BuXfXceFLstwzQCF7
Appendix B: Faculty member' Interview link: https://forms.gle/2CWCkdzaEERpkeaZ6