E-assessment during the Coronavirus Outbreak from the Perspective of Undergraduate at the University of Sharjah, UAE

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Abstract—The aim of the current research was to detect how undergraduates from the faculties of medicine, dentistry, pharmacy, and health sciences felt about using electronic assessment at the time of COVID-19. Cross-sectional research was made at the University of Sharjah in UAE between January and April 2021. As a study tool, a questionnaire with 26 items was created using Google Forms and disseminated by the registration department via the learner's E-learning platforms. The study's data were analyzed using SPSS software. The outcomes demonstrated that students had a high level of acceptance of the computerized assessment. The overall arithmetic mean of the students' replies was (3.49) and had a standard deviation of (1.33), indicating that they accepted the electronic assessment to a high degree. Furthermore, there was a discernible difference between the acceptance of the internet-based assessment by male and female students, but the College of Medicine (COM) students benefited significantly from the variation in acceptance of the assessment depending on the variable of college. Students who had inadequate computer capacities, on the other hand, were more receptive to electronic testing. The study's findings may be helpful in developing academic methods, rearranging assessment alternatives, and changing the academic curriculum to address the problems and limitations of electronic assessment.

Keywords—e-assessment, COVID-19, pandemic, health sciences, undergraduate, perspective

1 Introduction

The World Health Organization (WHO) confirmed the severe acute respiratory syndrome coronavirus 2 (SARS-CoV2)-caused coronavirus 2019 (COVID-19) as a pandemic on March 11, 2020. [1]. This virus is highly contagious it can spread from infected people to others by liquid particles when they cough, sneeze, speak, or breathe, it has rapidly spread across the world [1, 2]. Worldwide, several countries took restrictive measures to avoid this pandemic disease include social distancing, lockdown, wearing facemasks, travel limitations, and the halting of all non-critical events, and halting of all learning events [3]. Due to this, attendance at schools and universities has been disrupted; according to educational statistics, there are an estimated 1,5 billion pupils who have been impacted by school and university closures. [4–6]. The reaction to the COVID-19 by medical universities around the globe including University of Sharjah (UOS) have either suspended or canceled their classroom lectures, conferences, workshops, and activities and transitioned to distance /online teaching [7, 8]. Althouthe distance online learning has made the theoretical educational content easy to reach such as attending workshops around the word, video conferencing applications and educational blogs [9]. The abrupt switch to distance/ online learning, several obstacles were seen by educational institutions., one of them the assessment of students. Internet-based assessments were used by the majority of educational institutes at the time of COVID-19 pandemic as a students' assessment tool [10], which is considered challenging for education stitutionsonal and faculty members due to the increasing student numbers. However, many major concerns and difficulties were observed such as the technical problems related to internet connection, E-assessment platforms, anxiety among students about the mode of assessment, and the impracticality of such tests to assess practical and clinical skills [11–14]. Moreover, taking remote electro-examinations (E-exams) at home has many other challenges, one of these are the potential technical issues that affect the validity of an examination, academic dishonesty, and dishonest behaviors among students [15–17]. UOS has been applied to remote distance/online learning as a tool for students learning at the time of COVID-19 and the distant E-test weaken into account as the main assessment tool at the time of Covid [18, 19]. There hasn’t been much research exploring distant online testing in universities. Thus, the objective was to determine the level of acceptance of remote internet-based assessment at the time the COVID-19 among medical faculties at UOS in the (UAE). These faculties included the College of Medicine (COM), College of Dental Medicine (COD), College of Pharmacy (COP), and College of Health Sciences (CHS). The uniqueness of this research is that it advances and activates the use of electronic testing. The study will give the researcher the chance to address the lack of evidence for the use of electronic tests in the educational process, particularly in UOS.

1.1 Research questions

To investigate the level of acceptability of electronic evaluation during COVID-19 among students at UOS, UAE. As a result, the project aims to address the following questions:

RQ1: In light of the COVID-19 outbreak, how much do Sharjah University students embrace computerized testing?

RQ2: Does the acceptance of electronic assessment by Sharjah University students throughout the rollout of COVID-19 differ by gender, level of education, and computer proficiency?

1.2 Significance of study

- A better understanding of the perspective of medical and health science students might help identify the major obstacles to the most effective implementation, design, and administration of electronic tests.
- This study may be helpful in encouraging and easing the switch to continuous E-education and electronic tests as an assessment process in the system of education at the time and after an evaluation of COVID-19.
- Universities and other educational fields outside of UAE may benefit from the current study.

2 Methodology

2.1 Participants

The research participants consisted of 1150 undergraduates studying in the following four colleges of COM, COD, COP, and CHS at the time of the second term of 2020/2021. The participants were chosen by using the simple random sample method, which is a random technique which in the researcher can select a subset of a population (sample). When employing such sampling, each person in the community could be possibly chosen. Participants were given a total of 1150 questionnaires to complete to gather the information required to meet the research goals. 1032 of these were returned with all required fields filled in correctly. 118 individuals, representing all of the chosen colleges, failed to correctly complete the questionnaire. The participants thus became 1032 pupils. Table 1 shows the demographic statistics for the participants of uan ndergraduate who responded to the questionnaire correctly, Table 1 displays the details of the participants.

Table 1. Demographic Data of Participants

Study variables	Variables levels	Freq (f)	(%)
Gender	Male	503	48.74%
	Female	529	51.26%
	Total	1032	100%
College	Medicine	350	33.91%
	Dentistry	177	17.15%
	Pharmacy	226	21.90%
	Health Science	279	27.03%
	Total	1032	100%
Computer skills	Poor	243	23.55%
	Moderate	329	31.88%
	Good	326	31.59%
	Excellent	134	12.98%
	Total	1032	100%

2.2 Study tool

Data from the sample students were gathered using the questionnaire. COVID-19 was occurring when it was given to them at the time of the 2nd term of the year of study 2020–2021. Previous research in this field, [14, 15] was evaluated throughout the development of the questionnaire. Two sections make up the questionnaire. Basic data on the students were covered in the first section, and questionnaire paragraphs (n=26) depending on the study's goals were covered in the second.

The validity of the instrument. 11 UAE university instructors with good backgrounds in education were requested to act as arbitrators and to provide their opinions on the questionnaire paragraphs, including their usefulness for realizing the research goals and the quantity and thoroughness of the questions. The criticisms and revisions proposed by the educational professionals were taken into consideration, and the appropriate deletions, modifications, and extras were made. In order to meet the study's goals, the questionnaire was modified and eventually had 26 items.

Instrument reliability. Cronbach's alpha was employed to confirm the research tool's internal consistency. The determined Cronbach alpha coefficient for a pilot study comprising 50 students who were not from the research participants was 0.873.

2.3 Measures of data analysis

A five-dimensional Likert scale is employed in this research, as noticed in Figure 1 below.

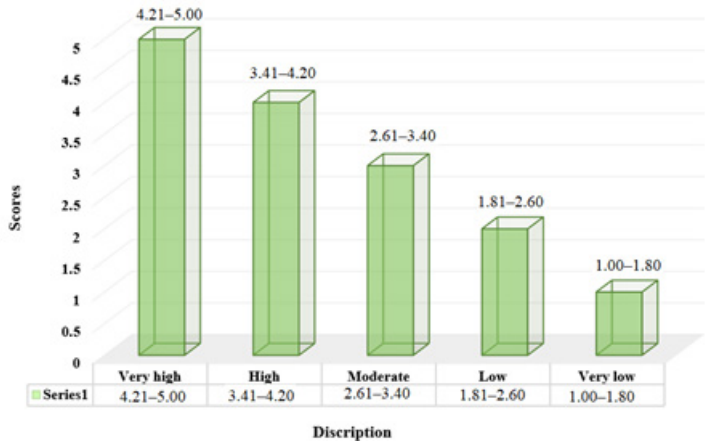

Fig. 1. Evaluation of Scale Data Using Different Scale and Score Interval Options

2.4 Data statistical analysis

The descriptive analyses (number, percentage, mean, and standard deviation), independent samples t-test, one-way ANOVA, and Scheffe tests were all performed by the researchers using the SPSS software program.

3 Results

3.1 Study results ascribed to Question 1: How much do Sharjah university students embrace electronic testing as it relates to the COVID-19?

To respond to the 1st question, we calculated the average scores and standard deviations of each participant's answers to questions 1–26 that were pertinent to the participants' agreement of E-assessment over the range COVID–19, as shown in Table 2.

Table 2. Descriptive Data for the participant's answers to the paragraphs regarding the Degree of agreement of E-assessment at the time of COVID-19

No.	Paragraphs	Mean	SD	Description
Q1	I think E-assessment exams are more stressful than conventional.	3.17	1.38	Moderate
Q2	I believe that I prefer E-assessment rather than traditional exams.	4.07	1.09	High
Q3	In my opinion, the regulations on e-assessments are clear and understandable	3.63	1.27	High
Q4	I believe that E-assessment exams are a flexible method of evaluation	3.47	1.15	High
Q5	I believe that students' e-assessment times are suitable	3.61	1.08	High
Q6	I feel that the E-assessment increases the chances and attempts of cheating among students.	3.69	1.15	High

No.	Paragraphs	Mean	SD	Description
Q7	The E-assessment offers me a more motivating experience than adopting traditional exam paper	3.80	1.08	High
Q8	The E-assessment exams helps in extracting and obtain results quickly.	3.98	1.01	High
Q9	E-exam provides me the capability of identifying and accessing unanswered questions easily	3.41	1.30	High
Q10	Environmentally, E-assessment is more responsive than paper test	3.27	1.25	Moderate
Q11	I believe that E-assessment is a precise and reliable method of evaluation.	3.30	1.32	Moderate
Q12	Compared to the printed conventional examination paper, E-assessment exams make me more stressed, pressured, and anxious.	3.22	1.28	Moderate
Q13	I feel that there are enough questions in the E-assessment exam.	3.40	1.29	Moderate
Q14	E-assessment exam contributes to raising the student's efficiency to learning	3.30	1.35	Moderate
Q15	I think that the E-assessment system is flawless and detailed	3.52	1.34	High
Q16	Taking the E-assessment exams needs fewer time than in the paper-based test	3.67	1.39	High
Q17	I believe E-assessment are more difficult than conventional paper exams	3.20	1.35	Moderate
Q18	I am extremely worried about the internet interruption while I conduct E-assessment exams.	3.59	1.35	High
Q19	E-assessment exams is designed to evaluate students in every course	2.97	1.57	Moderate
Q20	I prefer to take E-assessment exams to evaluate my knowledge	3.31	1.47	Moderate
Q21	I think that the E-assessment exam usually includes a variety of questions and with high thinking skills	3.23	1.58	Moderate
Q22	In my opinion, I can improve my academic performance by using the E-assessment.	4.21	1.32	V. High
Q23	I think that E-assessment time is adequate to answer all questions	3.72	1.46	High
Q24	I think that E-assessment exam makes me more interactive and enthusiastic during the test.	3.15	1.56	Moderate
Q25	I think that, when using the computer and internet, students don't need outside help	3.59	1.52	High
Q26	The E-assessment exam helps give me quick feedback	3.34	1.56	Moderate
Total		3.49	1.33	High

The results provided in Table 2 indicate that students accepted electronic assessments during COVID-19, with the mean response rate for all items (1-26) being 3.49 (SD 1.56). This statistic would suggest that most Sharjah University students prefer electronic assessments to traditional paper examinations at the time of COVID-19. Additionally, from Table 2 data that undergraduates's responses to Q-22, which asked, "In my viewpoint, I could enhance my academic achievement through using the E-assessment," received the highest mean score (4.21) at a great level. With a mean score of 4.07, Q-2 ('I feel that I prefer E-assessment rather than traditional tests.') came in second and performed similarly well. Additionally, Q-8, which said that "The E-assessment exams contribute to extracting and getting results quickly," placed third overall with a mean score of 3.99. The E-assessment gives me a more inspiring

experience than utilizing traditional test paper,' Q-7, which placed fourth overall at greater extent with a mean value of 3.80, is another example. Additionally, Q-23, which asks "I believe that E-assessment time is enough to answer all questions," is clear from the students' replies. Such a question was assessed as the sixth greatest level of agreement of utilizing the E-assessment exam, with a mean of 3.72, and it came at a high level. Similar results were obtained for Qs 6, 16, 3, 5, 25, 18, 15, 4, 9 and 22, with mean values of 3.69, 3.67, 3.63, 3.61, 3.59, 3.59, 3.52, 3.47, 3.41, and 3.41, respectively. The question 19 ("E-assessment exams is designed to evaluate students in every course") had the lowest mean (2.97), indicating a modest degree. Similar to Qs 13, 26, 20, 11, 14, 10, 21, 17, 1, and 24, a moderate degree was likewise attained with the corresponding mean values of 3.40, 3.34, 3.31, 3.30, 3.30, 3.27, 3.23, 3.21, 3.32, 3.17, and 3.15.

3.2 Findings ascribed to Question 2

Does the level of acceptability of internet-based assessment among Sharjah University students at the time COVID-19 differ according on gender, level of education, and computer proficiency? The significance of the differences among averages was assessed using the Scheffe's post-hoc comparison test, the one-way ANOVA test, and the t test after calculating the mean scores and SD for each item. The results of the study respondents' responses are provided below in accordance with the study variables.

First: Gender variations among students. As indicated in Table 3, a t-test was performed to determine the significance of the variations among the averages of the agreement of inrternet- based assessment by those learners at Sharjah University throughout the COVID-19.

Table 3. Means and Standard Deviations of Students' Responses Based on Gender

Gender	N	Mean	SD	Mean Difference	T. Value	df	Sig.	Sig. level
Male	503	3.42	0.662	0.095	2.046	1030	0.041*	Significant
Female	529	3.52	0.821					

* Statistically significant at ($p<0.05$)

As seen in Table 3. The findings shown in Table 3 demonstrate that the observed p (0.041) is below 0.05. Thus, the test at the 0.05 level is significant, indicating that there is a significant difference in the level of agreement of E-assessment by undergrads students at Sharjah University at the time of COVID-19 depending on the gender variable (males and females), in favor of females.

Second: College variable among students. The average agreement to internet-based assessment by UOS undergraduate students throughout the dissemination of COVID-19 was compared to other undergraduate students' average acceptance using a one-way ANOVA test to detect their relevance. Table 4 shows the findings of this variable's one-way ANOVA test.

Table 4. One-way ANOVA test for College Variable Among Students

		Sum of squares	Df	Mean square	F	Sig. (tailed)	Sig. level
College variable	among Groups	4.473	3	1.491	2.724	0.043*	Significant
	Within Groups	562.647	1028	0.547			
	Total	567.120	1031				

* Statistically significant at ($p<0.05$)

The results, which are shown in Table 4, demonstrate that there are statistically significant changes in undergrads' opinions depending on the variable of faculty since the p-value is 0.043, which is lower than the necessary statistical significance threshold (0.05). The results of the following comparisons, which employed the Scheffe test to detect the cause of the discrepancies, are displayed in Table 5. The results in Table 5 highlight the fact that students in the college of Medicine benefited from the variations in student acceptance of internet-based assessment according to the variable of faculty.

Table 5. The Scheffe Test Results based on the College Variable

(I) The college		Mean Difference (I-J)	Sig.
Medicine	Dentistry	0.12585	0.065
	Pharmacy	0.09958	0.115
	Health science	0.16079*	0.007
Dentistry	Medicine	-0.12585	0.065
	Pharmacy	-0.02627	0.723
	Health science	0.03494	0.623
Pharmacy	Medicine	-0.09958	0.115
	Dentistry	0.02627	0.723
	Health science	0.06121	0.356
Health science	Medicine	-.16079*	0.007
	Dentistry	-0.03494	0.623
	Pharmacy	-0.06121	0.356

* Statistically significant at ($p<0.05$)

Third: The variable of computer skills among undergraduates. The agreement of internet-based assessments by undergraduate sat UOS at the time of COVID-19 distribution was compared between averages using a one-way/ANOVA test to determine the significance of the discrepancies. Table 6 displays the results of this variable's one-way ANOVA test. Given that the p-value for the computer skills variable is 0.000, which is less than the necessary statistical significance at (0.05), the results, as shown in Table 6, clearly demonstrate that there are statistically significant variations in learners' opinions.

Table 6. One-way ANOVA Test for computer skills variable among undergrads

		Sum of squares	Df	Mean square	F	Sig. (tailed)	Sig. level
Computer Skills	Among Groups	20.382	3	6.794	10.796	0.000*	Significant
	Within Groups	646.964	1028	0.629			
	Total	667.346	1031				

* Statistically significant at ($p<0.05$)

The results of the following comparisons, which employed the Scheffe test to determine the cause of the discrepancies, are displayed in Table 7 below. The findings in Table 7 demonstrate that students with poor computer abilities were favored as the cause of disparities in their acceptance of the E-evaluation assessment based on the computer skills variable.

Table 7. The Scheffe Test's findings in light of the computer skills variable

(I) Computer skills		Mean Difference (I-J)	Sig.
Poor	Moderate	0.24748*	0.004
	Good	0.37524*	0.000
	Excellent	0.29950*	0.007
Moderate	Poor	-0.24748*	0.004
	Good	0.12776	0.236
	Excellent	0.05202	0.938
Good	Poor	-0.37524*	0.000
	Moderate	-0.12776	0.236
	Excellen	-0.07574	0.834
Excellen	Poor	-0.29950*	0.007
	Moderate	-0.05202	0.938
	Good	0.07574	0.834

* Statistically significant at ($p<0.05$)

4 Discussion

COVID-19 impacted education worldwide. Universities have responded to the halt in many ways, nonetheless, the most common practically ubiquitous reaction is shifted to online teaching, learning, and assessment. In the assessment of medical students performance to get over the constraints of a single evaluation, numerous techniques of assessment and helpful feedback are needed. During the period of Covid-19, the electronic exams in distance were regarded as a primary type of assessment for undergrads in medical colleges. The majority of students view assessments as success indicators for their academic achievement, making them an essential tool in the learning process [20]. In recent years, online tests have been created and then utilized extensively in higher education [21]. Web-based learning (WBL), which increases the efficacy of instructional programs, has quickly changed contemporary medical education. [22]. Although electronic exams have included being approved by many

collages in UOS before the pandemic but were mainly performed in-university campuses, therefore, the covid-19 of distance electronic tests has boosted valuable worries for universities, colleges, and students [23]. therefore, our objective was to evaluate the acceptance of distance electronic assessment of COM; College of COD; COP; CHS students during the COVID-19, moreover, we evaluated the acceptance of E-assessment based on gender, college, and computer skills to detect assessment barriers and student weaknesses. The research results indicated that medical students in the UOS had a high acceptance of electronic assessment than compared to conventional paper exams at the time of COVID-19. The previous adoption of online exams of COM students, in addition, the knowledge and experience of staff in modes of online/distance learning and assessment; and the availability of resources and equipment, like electronic exam platforms, PCs, webcams, headsets might have contributed to this response [7]. A similar study by [15] found that remote electronic tests were less favored among 2/3 of students in comparison to on-campus electronic tests. Another study by [24] reported that 58.82% of respondents expressed their great satisfaction with online workshops, online assessments, and virtual classrooms. In our research, a high number of students indicated that they improve their academic performance by using the E-assessment, the improved performance may be the result of using cutting-edge tools and online resources for remote learning in UOS. According to research [25] on pre-doctoral students at a dentistry school in the USA, online courses offered at the time of COVID-19 might provide student course performance that was on par with or better than that of the identical in-person courses offered prior to the pandemic. One of the advantages of the online course, the students are able to view recordings of the lectures, which helps them identify the important points that the doctors mentioned during the lectures that they might have missed, as study in Al Ain University, UAE among students showed that the students perform significantly better in exams when taught online [26]. Students who study remotely benefit from a variety of benefits, such as unrestricted access to educational resources like lecture recordings, networking chances with people from various cultural and geographic backgrounds, and scheduling ease. [27]. On the other hand, a major of the students reported that prefer electronic assessment rather than traditional exams. The main advantages of using E-assessment include improving student performance, raising instructors' efficiency, cutting expenses for the organization, and providing students with immediate feedback. High-order thinking development is one of the educational purposes. [28]. That is why a good number of students indicated that electronic assessment exams help in extracting and obtaining results quickly, using electronic assessment will also save the instructor time because paper tests need the teacher to spend time correcting each paper [29-39]. In this study, the students reported that they believe that E-assessment time is enough to answer all questions. The University of Sharjah created Online Exam Guidelines, one of the instructions in this guide is the instructors must solve the exam ahead of time in order to estimate the time needed to solve it and to avoid errors in it. as well as determine the duration of the exam, as the average time for answering one multiple-choice question is 45 seconds, and the duration of the exam should be in the range between 75 minutes and 120 minutes, based on the reasonable time required to answer the exam question [40]. Our findings highlighted a significant difference in the degree of the

agreement of electronic assessment by students, the females reported the acceptance of E-assessment more than the males. This gender disparity may result from female students' greater dedication to participating in various educational activities. In the study of [24], in comparison to the in-person meetings of the relevant year, a substantial improvement in the female students' first- and third-year mean PBL marks were seen throughout the online sessions. Females are more likely than males to enroll in online courses, according to different research [41], and the authors speculated that this may be because women feel safer at home. According to the research, students with poor computer capacities were more likely to accept an electronic evaluation than those with better computer skills. Furthermore, only 30% of the students by Hamsatu et al. (2016) strongly agreed that the test is technical and requires computer abilities, whereas 10% disagreed and 3.33% disputed that the exam is not technical and does not require computer skills. Because just one institution participated in this study, it is possible that the results cannot be generalized. The study was also carried out a year after the epidemic when the majority of students had good to a very good experience with distance learning and knew how to handle electronic evaluation.

5 Conclusion

Currently, electronic exams are considered an important tool in distance education, the results of this research found out that most learners from Faculties of Medical Sciences at the University of Sharjah prefer electronic assessment comparative of conventional paper exams at the time of COVID-19. the Collage of Medicine students preferred the electronic assessment rather than other students. The females reported more acceptance of electronic assessment than males, while the accepting of E-assessment assessment based on the variable of laptop experience was for students with poor laptop skills. Our findings will be useful in developing academic methods, rearranging assessment alternatives, and changing the academic curriculum to address the problems and challenges presented by electronic examinations.

year).

6 Limitations of the study

It is a must to acknowledge that this research had several limitations to be acknowledged, as with any other analysis. A principal limitation of this study was that it only looked at the responses of students; responses from faculty members were not gathered. The second limitation was that the research participants were limited to 1150 students studying in the following four colleges of COM, COD, COP, and CHS at the time of the second course of 2020/2021.

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