# Investigating the Attitudes of Diploma Students in Teaching Toward the Use of Electronic Assessment in Learning

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*The purpose of this study was to investigate and understand the attitudes of students enrolled in the Postgraduate Professional Diploma (PPD) program toward the use of electronic assessment. It also sought to clarify the relationship of their attitudes to gender, language, and computer proficiency. A survey questionnaire was used to collect data and investigate students' attitudes. A total of 364 students (328 females and 36 males) participated in the survey. The findings of the study suggested the impact of language on attitude toward the use of the electronic assessment in learning. Although the results of the study indicated no significant gender differences, female participants were found in favor of the electronic assessment more than their male counterparts. Likewise, students with weak or good computer skills favored the electronic assessment more as compared to students with excellent, very good, or acceptable computer proficiency. The present study broadens our knowledge on students' attitudes toward electronic assessment in relation to gender, language, and computer proficiency.*

*Keywords: e-learning, electronic assessment, attitude, gender, language, computer proficiency*

## INTRODUCTION

Electronic assessment has become one of the most important evaluation strategies due to the current developments in the field of educational technology. The conditions of the COVID-19 pandemic have reinforced attitudes toward electronic assessment created due to the necessity of communication and distance learning. This strategy can no longer be dispensed as it has proven its effectiveness. Electronic

assessment and distance learning, in general, have become acceptable options even under normal conditions in the educational process (El-Diasty & Khalaf, 2019; Hanifi, 2019).

With the recent increase in demand for e-learning and online learning, especially with the conditions imposed by the spread of the COVID-19 throughout the world at the beginning of 2020, online learning and e-learning have become suitable alternatives for the continuation of the educational process (Hanifi, 2019; Youssef, 2020). Electronic assessment is one of the e-learning tools and has become a necessary application in the educational process to measure educational outcomes.

The electronic assessment is no longer an option but rather has become a necessary and important strategy in light of accelerated changes in applications related to learning and teaching in particular, imposed by technological development. The COVID-19 pandemic has strongly pushed educational institutions toward the use of modern technologies in the teaching and learning process largely, and one of the most prominent results was the use of e-learning and distance learning, and the use of electronic assessment with its various methods and tools. Therefore, it is important to conduct studies about electronic assessment in terms of the methods, tools, and importance, and how to manage this type of evaluation and all its associated elements (Boudjellal & Boudiaf, 2021).

This study intends to investigate and understand the attitudes of learners, especially students enrolled in a professional higher diploma at Al Ain University. The importance of this study is that these learners will one day soon become teachers, trainers, developers, and innovators, and their role will be pivotal in implementing the electronic assessment strategy (Atallah, 2016).

The findings of the study contribute to the literature on the role of electronic assessment and its importance as a comprehensive and integrated strategy—cognitively, skillfully, and emotionally—as the university can benefit from the results of this study by supporting and developing electronic assessment in the educational process, thereby supporting students and developing their skills in the electronic assessment process, motivating them to innovation.

## THE NATURE OF ELECTRONIC ASSESSMENT

In line with technological developments, the research orientation in the education process in recent years has shifted to e-learning and its tools. Consequently, research in this area has accelerated and diversified. Electronic assessment involves the use of information networks, computer equipment, educational software, and various scientific materials, using electronic means to collect and analyze students' responses to discuss and assess the effects of educational programs and activities, and a sound judgment (Zaher, 2009).

According to the above description, "electronic assessment" is an organized and continuous process carried out according to established plans and through which data and information are collected. It measures the progress and development process of the learner, and analyzes their strengths and weaknesses through the use of modern computer technologies, programs, and communication platforms, making objective judgments to support the appropriate decision, treatments, and feedback.

## METHODS AND TOOLS OF ELECTRONIC ASSESSMENT

The tools and methods used in the electronic assessment process aim to reach the highest standards of skill performance and knowledge level. The diversity of methods leads to a diversity of tools; among these methods are achievement files, electronic concepts, self-evaluation, and peer assessment. In addition, interviews and oral tests via video, and various tasks and assignments through different applications and programs are used to provide feedback (Abdul Hamid, 2005).

Tests are one of the most important methods of electronic assessment. They represent continuous and sustainable monitoring of the education process to determine the level of performance of the learner. Special techniques and tools for assessment include Google Form, Quizizz, Kahoot, and others. Al-Ain University uses Moodle as a tool for electronic assessment. Electronic assessments can be designed as placement tests, diagnostic prescriptive tests, timed tests, or achievement tests (Al-Obeid & Al-Shaya, 2015).

Achievement tests are the most widely used in the electronic assessment. According to Al-Othman (2011), the use of electronic assessment tools in the correct way helps achieve objectivity and reduces errors while allowing the teacher to view an analysis with percentages, reports, and graphs, and therefore detect students' strengths and weaknesses in an accurate manner. Certainly, the diversity and multiplicity of electronic assessment methods achieve the concept of comprehensive assessment, which cannot be provided by traditional assessment systems specified in a specific time and place (Mohammad, 2015).

## THE IMPORTANCE OF ELECTRONIC ASSESSMENT

Electronic assessment represents an interactive, reciprocal relationship with the learners themselves. It can portray realism through multimedia as the multiplicity of electronic assessment methods and tools makes the tasks circulated and presented through multimedia more realistic. The electronic assessment depends on electronic networks (Croxton, 2014). The findings of studies reported by Martínez et al. (2015) and Al-Badou (2018) suggested that electronic assessment enhances the interaction between learners, clarifies the role of feedback, and contributes to improving the learning process.

The process of achieving the goals of electronic assessment cannot be done correctly and effectively without setting smart goals. The general objective of the electronic assessment is to link and develop learners' skills to real life as well as raise their level of knowledge and motivate them to put forward new and creative ideas. The electronic assessment also works to enhance the student's self-confidence through self-evaluation (Hassan & Al Marei, 2016).

Besides the development of individual learners without comparison to other learners and attention to strengths instead of focusing on weaknesses, the electronic assessment contributes to reaching a society capable of responding to all possible developments and possessing a high culture in dealing with modern technologies. In addition, it reduces the financial cost related to the distribution and collection of paper materials and removes a large burden from the teacher through correction and monitoring (Lee, 2012).

The electronic assessment also helps learners gain greater control over electronic platforms and provides an attractive and flexible environment that increases learners' motivation to achieve creativity and innovation (Dikli, 2003). For teachers, the electronic assessment shortens the time needed to prepare the assessment, reduces the effort, motivates the teacher to develop and innovate, and provides immediate feedback through available technologies and communication platforms. The process also contributes to reducing paper use as well as dependence on the human element (Khan & Khan, 2019).

## CHALLENGES OF ELECTRONIC ASSESSMENT

The conditions imposed by the COVID-19 pandemic contributed to overcoming many obstacles and challenges facing e-learning and the electronic assessment process. A weak technical infrastructure was one of the most prominent challenges facing many countries. This problem has been solved with good infrastructure in many countries. As for the cognitive and skill challenges in the use of technology, the solution was found in raising and intensifying the level of training for both the teacher and the learner (Al-Emran, 2017). However, this did not prevent the emergence of new challenges related to electronic assessment.

One of these challenges is the rising cost of building networks, the Internet, and electronic assessment technologies; however, despite the presence of many free technologies that governments have purchased and deployed to reduce the financial burden on low-income earners, and good computers are not accessible to everyone. The problem of electronic security still accompanies some of the programs used in electronic assessment. In addition to the requirements of standards and outputs for electronic assessment, it may become chaotic and ineffective as a result of the speed required for reporting results (Tan, 2013).

The monitoring of assessments is another challenge in the electronic domain. Even with controls over what can be opened during the assessment (save browser), cases of fraud or cheating are always possible. This requires the presence of more advanced control methods to reach realistic results that are compatible with the standards, outputs, and goals that we aspire to reach (Boudjellal & Boudiaf., 2021). As noted by

Dikli (2003), there are pros and cons of electronic and traditional assessments, and a balanced method must be used between them; it is the teacher who decides which type is used according to the needs and goals.

## RESEARCH QUESTIONS

The main purpose of this study is to investigate and understand the attitude of PPD students toward the use of electronic assessment. The study attempts to address the following two important research questions:

1. How do PPD students at Al Ain University perceive electronic assessment?
2. Are there any significant differences in socio-demographic factors, including gender, language, and computer proficiency between PPD students with negative/positive attitudes toward electronic assessment?

## METHODS

This is a descriptive study based on data collected through a survey questionnaire. The study population consisted of 500 students enrolled in the PPD program at Al Ain University during the academic year 2021–2022. The study sample comprises 364 students selected randomly from the study population. The collected data were analyzed using Statistical Package for the Social Sciences (SPSS). The independent sample t-test, one-way ANOVA, and means are used to answer the stated research questions. Table 1 reports the distribution of study participants.

**TABLE 1**
**STUDY PARTICIPANTS**

| Variable | Category | Frequency | Percentage |
|---|---|---|---|
| Gender | Female | 328 | 90% |
| | Male | 36 | 10% |
| Computer Proficiency | Excellent | 136 | 37% |
| | Very good | 134 | 36% |
| | Good | 85 | 23% |
| | Acceptable | 6 | 3% |
| | Weak | 3 | 1% |
| Study Language | Arabic | 303 | 84% |
| | English | 61 | 16% |

## THE STUDY INSTRUMENT

To achieve the study's purpose and after a thorough review of related studies (Atallah, 2016; Boudjellal & Boudiaf, 2021), a questionnaire was prepared regarding the application of electronic assessment. The questionnaire in its initial form consisted of 24 items. To ensure the phase validity of the instrument, it was presented in its initial form to four experts and professionals who specialize in curricula and teaching in order to verify the clarity of the paragraphs and their relevance for the measurement. Based on their suggestions and recommendations, modifications were made and the number of items increased from 24 to 25.

The questionnaire's reliability was confirmed by calculating the internal consistency coefficient for the items using Cronbach's alpha on a randomly selected exploratory sample from the study population (30 questionnaires). The reliability coefficient on the total score of the instrument indicated $\alpha = 0.76$, which is suitable for the study.

## RESULTS AND DISCUSSION

### Students' Attitudes Toward Electronic Assessment

The first research question in this study intends to determine students' attitudes toward the use of electronic assessment. For this purpose, participants were asked to express their attitudes toward 25 statements that reflect the benefits and advantages of electronic assessment.

As presented in Table 2, all 25 statements received a high mean score. The findings of the study showed that the highest top three advantages perceived by the students are the contribution of electronic assessment to shorten time and effort (Mean score = 4.48), developing technological skills (Mean score = 4.46), and developing technological capabilities (Mean score = 4.43). Meanwhile, individual differences received the lowest score (Mean score = 3.98) followed by using electronic assessment for practical courses (Mean score = 4.04) and a need for designing a simple electronic assessment tool (Mean score = 4.07).

These results are in line with findings of previous studies that showed a positive attitude among students toward electronic assessment (El-Diasty & Khalaf, 2019; Atallah, 2016; Hassan & Al Marei, 2016), and learners' preference for using electronic tests (Tan, 2013; Al-Emran, 2017). The results could reflect the advantages of the electronic assessment. These advantages include, among others, continuity; ease and speed of use for the teacher and the learner; flexibility in using the assessment any place and any time; and an interactive environment that is attractive to the learner during the learning and assessment process, which contributes to learner motivation (Martínez et al., 2015).

For the teacher, the advantages include allowing the teacher to invest time in innovation and development due to its ease of use; shortening the time in employing it; the lack of effort it requires; and the possibility of using various tools in the assessment. In addition to providing immediate feedback, electronic assessment provides students' performance analyses and reports, and supports the evaluation process (Youssef, 2020; Khan & Khan, 2019; Mohammad, 2015).

Moreover, electronic assessment allows the teacher to keep records and student results electronically, and access them when needed. In this context, the findings of Martínez et al.'s (2015) study showed that immediate feedback to students via e-mail helped improve their performance. Similarly, El-Amrousy (2014) found electronic evaluation to be effective in reducing psychological stress among students and faculty members, consistent with the findings of the current study (see item no. 18, Table 2).

**TABLE 2**
**STUDENTS' ATTITUDES TOWARD ELECTRONIC ASSESSMENT**

| No. | Item | Mean | Status |
|---|---|---|---|
| 1. | Electronic assessment shortens time and effort. | 4.48 | High |
| 2. | Electronic assessment has developed my skills in preparing electronic assessment tools. | 4.46 | High |
| 3. | The electronic assessment has developed my technological capabilities. | 4.43 | High |
| 4. | Electronic assessment is compatible with the requirements of the times. | 4.40 | High |
| 5. | The electronic assessment shares in improving my academic achievement. | 4.39 | High |
| 6. | I find that the electronic assessment provokes a greater motivation for learning. | 4.36 | High |
| 7. | I can use computer technologies. | 4.34 | High |
| 8. | Electronic assessment will be the best choice for the calendar in the future. | 4.34 | High |
| 9. | Electronic assessment is less financially costly. | 4.34 | High |
| 10. | The electronic assessment strengthened my study skills. | 4.32 | High |
| 11. | The electronic assessment has improved my attitudes toward education and teaching. | 4.29 | High |
| 12. | I intend to use the electronic assessment with my students in the future. | 4.28 | High |

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|---|---|---|---|
| 13. | Using the electronic assessment is easier than using the traditional assessment. | 4.28 | High |
| 14. | Electronic assessment improves my understanding of educational subjects. | 4.28 | High |
| 15. | I enjoy responding to an electronic assessment more than the traditional use of paper and pen. | 4.27 | High |
| 16. | I sincerely trust the results of the electronic assessment in measuring the true level of my academic achievement. | 4.24 | High |
| 17. | Electronic assessment is suitable for theoretical courses. | 4.22 | High |
| 18. | Electronic assessment reduces the level of exam anxiety. | 4.22 | High |
| 19. | Electronic assessment increases my ability to focus. | 4.18 | High |
| 20. | Electronic assessment is suitable for measuring all knowledge and skills levels. | 4.14 | High |
| 21. | Electronic assessment is more compatible with the tendencies of future generations. | 4.10 | High |
| 22. | I see the necessity of continuing to use the electronic assessment in the future. | 4.08 | High |
| 23. | Electronic assessment needs simple skills in the use of technology. | 4.07 | High |
| 24. | Electronic assessment is suitable for practical courses. | 4.04 | High |
| 25. | Electronic assessment takes into account individual differences. | 3.98 | High |

*Note: Overall mean score for the scale = 4.25*

## GENDER DIFFERENCES

An independent sample t-test is used to identify gender differences in the students' attitudes toward the use of electronic assessment. As presented in Table 3, the findings of the study show that there are no statistically significant gender differences among students ($p$-value > 0.05). However, the mean scores indicate that female participants are more favorable toward using electronic assessment (Mean score = 4.27) than the male participants (Mean score = 4.13). The findings suggest that gender has no impact on the attitude of participants toward the use of electronic assessments.

The findings of the study are in line with the findings of previous studies (Atallah, 2016; Boudjellal & Boudiaf, 2021; Hassan & Al Marei, 2016) that showed no statistically significant gender differences in students' attitudes toward electronic assessment. The result can be explained by the fact that male and female students live in a homogeneous society and environment, and they learn under very similar educational environments and conditions.

In addition, students have a greater ability to deal with distance learning. The findings suggest equal opportunities for males and females in learning, using electronic applications and programs, and obtaining smart devices at school and home. This allowed many students to use these programs and applications early, even before reaching the university education stage, and reduced the burden on students in the learning process (Khan & Khan, 2019). This also made it easier for students enrolled in the diploma program to deal with the electronic assessment, especially as some of these students are employees and housewives who have the ability to interact with the distance learning pattern.

**TABLE 3**
**GENDER DIFFERENCES**

| Gender | Mean | SD | *t* value | *p*-value |
|---|---|---|---|---|
| Male | 4.13 | 0.66 | 1.322 | 0.187 |
| Female | 4.27 | 0.57 | | |

** Significant at 0.05 level*

## LANGUAGE DIFFERENCES

Table 4 presents the results of an independent sample t-test used to see how a difference in the language of instruction affects students' attitudes toward the use of electronic assessment. The findings reveal statistically significant language differences among students (p-value < 0.05). Moreover, the mean scores indicate that students receiving English language instruction are more favorable toward the use of electronic assessment (Mean score = 4.46) than those receiving instruction in Arabic (Mean score = 4.21). The findings suggest that the language of instruction influences the attitude of participants toward the use of electronic assessment.

In line with a previous study (Atallah, 2016), the findings of this study show statistically significant language differences in attitude toward the use of electronic assessment. This suggests the importance of the English language in learning alongside the Arabic language. The reason may be because the electronic assessment programs and their various applications and tools are originally written and placed mainly in the English language rather than Arabic. Therefore, educational institutions in general and the university in particular should continuously translate what is related to these programs and tools into Arabic.

Moreover, these programs are subject to constant updates, usually written in English. Accordingly, students who study in English can understand the subjects written in it more than others and can keep abreast of updates in those programs and tools, allowing them to learn about its advantages and characteristics as well as the shortcomings related to it; hence, these students will form a clearer view about dealing with these programs and applications in general related to the electronic assessment, and use them more effectively than others studying courses in the Arabic language.

Another possible factor behind this finding is that the PPD program in Teaching at Al Ain University offers a major in Methods of Teaching Science and a major in Mathematics and Technology in the English language, whereas literary specializations, such as Methods of Teaching the Arabic language, Islamic Education, and Islamic Studies are taught in Arabic. Enrollments in these specializations might have contributed to the differences among students in their attitudes toward electronic assessment.

**TABLE 4**
**LANGUAGE DIFFERENCES**

| Language | N | Mean | SD | *t* value | *p*-value |
|---|---|---|---|---|---|
| Arabic | 303 | 4.21 | 0.59784 | 2.950 | 0.003* |
| English | 61 | 4.46 | 0.49647 | | |

** Significant at 0.05 level*

## DIFFERENCES IN COMPUTER PROFICIENCY

As presented in Table 5, the ANOVA test is used to calculate differences in students' attitudes toward the use of electronic assessments. The findings of this study show no statistically significant difference among students (*p*-value > 0.05). However, by looking at the mean differences, the results of the test reveal that students with weak computer proficiency skills are more favorable toward using electronic assessment (Mean = 4.75) than students with excellent or good computer skills (Mean = 4.3). On the other hand, participants with acceptable computer proficiency are less favorable toward using electronic assessment (Mean= 3.95). In general, the results suggest that the level of computer proficiency does not influence attitude toward the use of electronic assessment.

This finding can be explained by the fact that students' knowledge of using computers and dealing with computer applications has become one of the basic requirements not only for the universities but the schools as well. At the school level, the computer has become one of the major subjects for students in the UAE. Therefore, it is not surprising to see that the students do not differ in attitude toward electronic assessment. Moreover, by joining the universities, students receive sufficient and equal training and guidance on how

to use different learning platforms and applications, thus strengthening their knowledge and skills in using different modules of electronic assessment.

**TABLE 5**
**COMPUTER PROFICIENCY DIFFERENCES**

| Computer Proficiency | Mean | F value | *p*-value |
|---|---|---|---|
| Weak | 4.75 | | |
| Good | 4.30 | | |
| Excellent | 4.30 | 1.647 | 0.162 |
| Very good | 4.18 | | |
| Acceptable | 3.95 | | |

** Significant at 0.05 level*

## CONCLUSION

Electronic assessment is an essential tool for determining students' performance in academic activities. It has many advantages that encourage educational professionals and institutions to use electronic assessments. The advantages include shorter time, less effort, improved IT skills, and improved academic achievement. In addition, the use of electronic assessment provokes a greater motivation for learning, strengthens learning skills, and is less costly. Moreover, electronic assessment proves to be suitable for theoretical courses, reduces examination anxiety, and is suitable for measuring all knowledge and skills levels.

Accordingly, the current study recommends the use of electronic assessment in learning, especially in light of the continuation of distance learning. Distance learning is an option for the continuation of the educational process. In addition, the electronic assessment can be used together with the traditional assessment. However, there is a need to take the necessary measures to ensure the application of the electronic assessment impartially and to reduce the incidence of academic dishonesty. Moreover, there is a need to diversify the assessment tools in line with the nature of the experiences that students learn by considering individual differences.

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