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STUDENTS' PERCEPTIONS OF THE STRENGTHS AND LIMITATIONS OF ELECTRONIC TESTS FOCUSING ON INSTANT FEEDBACK

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ABSTRACT

Aim/Purpose	Students' perceptions about feedback in e-tests have not been studied using qualitative methods. Therefore, the objective of this study was to investigate the students' attitude towards electronic tests, focusing on the feedback.
Background	Despite the advantages of electronic tests, it is one of the neglected technologies in the students' evaluation process. Based on the technology acceptance model, users' attitudes have a significant impact on the acceptance of each technology. There is a paucity of qualitative research regarding the examination of students' attitudes towards e-testing and instant feedback.
Methodology	A pilot study was used to achieve the aims of the study. Using purposeful sampling, the attitudes of 40 students from the University of Birjand who participated in the electronic test were examined.
Contribution	This study suggests interventions to improve the acceptance of electronic tests and reduce resistance to them. It provides insight into understanding the nature of immediate feedback in electronic tests, puts forth suggestions for the successful implementation of e-tests in the students' evaluation process, and further provides information on the relationship between immediate feedback and student test anxiety.
Findings	Among the various features of electronic tests, instant feedback has attracted students' attention more than others. Students' perceptions about instant feedback were contradictory, because some felt instant feedback is stressful, while others considered it desirable. Based on the results, feedback on electronic tests: opportunity or challenge was selected as a main theme.
Recommendations for Practitioners	Practitioners should consider student attitude toward feedback in e-tests and they should personalize e-test feedback according to students' preferences.

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Recommendations for Researchers	Researchers can examine quantitative and qualitative variables such as personality type, study approaches, exam anxiety and other factors in studying student's attitudes towards feedback.
Impact on Society	Teachers can use these finding in designing and developing e-tests in their formative and summative assessments, where they select the optimal feedback strategy for their assessments.
Future Research	This study highlights that instant feedback is not necessarily acceptable to students. Further study is necessary to find when it is good and when it is not, for whom it is good or bad, how we can reduce the negative effects of instant feedback, and whether it increases exam anxiety or not.
Keywords	electronic test, assessment, feedback, student perceptions, instant feedback

INTRODUCTION

The emergence of information technology has changed all aspects of human life; educational systems, due to their epistemic nature, have been affected by information technology more than other systems. Assessment and evaluation is one of the most important areas of education influenced by technology. Computer-based assessment (CBA) is among the manifestations of the impact of technology on the process of teaching and learning evaluation. Computer-based assessment history dates back to the early 1970s (Drasgow, 2002; Shute & Rahimi, 2017). CBA refers to tests administered to students by computer (Dembitzer, Zelikovitz, & Kettler, 2018). Similarly, CBA is defined as the use of computers to deliver, mark or analyze assignments or exams (Sim, Holifield, & Brown, 2004). Over the past few decades, because of certain benefits, computer-based assessments have become more commonplace than ordinary paper-based tests. Among the advantages, mention can be made of reduced costs, instant feedback, automatically registered scores, provision of comparative tests, data collection during test stages, and multimedia testing sections for measuring and understanding complex skills (Jeong, 2014). Also, according to Mason, Patry, and Bernstein (2001), computer-based assessment increases teachers' direct instruction time by reducing the testing time.

Computer-based tests can further be utilized to collect more complex data, such as processes and problem solving strategies, and to estimate the actual performance of examinees (Parshall, Davey, & Pashley, 2000). Moreover, online quizzes have significant impacts on classroom engagement (Urtel, Bahamonde, Mikesky, Udry, & Vessely, 2006). Hwang and Chang (2011) showed that mobile-based formative assessment promotes the students' learning interest and attitude, and improves learning achievement. Recently, some new and interesting potentials of online testing have been revealed. For instance, according to Prisacari and Danielson (2017), students use scratch paper more on paper-based tests compared to online tests. Scratch paper is used for quick notes, drafts, or sketches, a process which increases the test completion time and the possibility of errors.

Recently reported drawbacks of computer-based assessment include the time-consuming process associated with learning and setting up the e-testing systems, giving individual feedback, re-entering comments and software errors (Debusse & Lawley, 2016). Students' low performance on Computer-Based Test (CBT), compared to paper-based assessment, can be added to these downsides (Jeong, 2014). However, it is to be noted that low scores of examinees depend on some other variables like question length, computer screen size and resolution. As reported by Worrell, Duffy, Brady, Dukes, and Gonzalez-DeHass (2016), students score lower in computer-based tests with long reading passages. Another variable affecting students' score is screen size and resolution; for instance, the study of Bridgeman, Lennon, and Jackenthal (2003) revealed that students' verbal scores were higher in large and high-resolution display. Another limitation reported in the literature which can affect the

students' score is the fact that questions cannot be marked or highlighted in computer-based assessments (Worrell et al., 2016).

Gikandi, Morrow, and Davis (2011) revealed that validity and reliability threats and dishonesty within online formative assessment are other restrictions in the review of literature. The problem of installation and training requirements reported by Cargill (2001) seems to have been resolved with the advancements in technology.

Immediate feedback is frequently reported in literature as one of the capabilities of computer-based assessments (Bayerlein, 2014; Debuse & Lawley, 2016; Maier, Wolf, & Randler, 2016; Worrell et al., 2016). Feedback is associated with how the student's present state (of learning and performance) relates to educational goals and standards (Nicol & Macfarlane-Dick, 2006). By feedback, student performance can be compared with the learning goal (Maier et al., 2016).

Feedback is divided into two types, internal and external; in the former, students monitor their engagement with learning activities and assess their progress towards goals; on the other hand, external feedback is provided by teachers and peers (Nicol & Macfarlane-Dick, 2006). Elaborated feedback and simple verification feedback are among other classifications of feedback (Maier et al., 2016). Miller (2009) has reported four types of feedback: 1) directing students to a resource, 2) rephrasing a question, 3) providing additional information, and 4) providing the correct answer. According to Economides (2009), conative feedback in CBA enhances the student's willingness to learn and succeed in the assessment.

Feedback is important because it guides students' learning. The fact that online learning is becoming all the more prevalent adds to the significance of feedback (Bayerlein, 2014), which helps students learn from mistakes and correct their errors or misconceptions (Gill & Greenhow, 2008), and further contributes to self-regulated learning (Nicol & Macfarlane-Dick, 2006). Feedback after wrong answers can show students that their conceptual understanding is not suitable for the problem, while feedback after correct answers stabilizes student's conceptual understanding (Maier et al., 2016). Interactive formative feedback addresses the threats to validity and reliability (Gikandi et al., 2011).

Higgins & Bligh (2006) holds that good feedback must 1) facilitate the development of self-assessment (reflection) in learning, 2) encourage teacher and peer dialogue around learning, 3) elucidate what constitutes good performance, 4) provide opportunities to improve performance, 5) deliver information which is focused on student learning, 6) encourage positive motivational beliefs and self-esteem; and 7) provide information conducive to shaping the teaching process.

In spite of the benefits and limitations associated with CBA in general and for feedback in particular, the acceptance and development of this technology are faced with challenges. As Chien, Wu, and Hsu (2014) have cited from several sources regarding the importance of people's attitudes, opinions and views on technology, studying users' attitudes towards technology is important in accepting or rejecting any kind of technology. There are several factors that affect the performance of learners during an electronic test, such as the quality of a computer screen; however, there are other factors that are less noticeable, for instance, the testers' attitude to electronic testing (Tella & Bashorun, 2012). Yet previous studies on attitudes towards CBA have focused on teachers' beliefs rather than students' attitudes towards CBA, as is observed in the study of Chien et al. (2014), Jamil, Tariq, Shami, and Zakriys (2012) and J.-Y. Kim (2015). In this case, Terzis and Economides (2011) pointed out that the effective development of a CBA depends on students' acceptance. Some of these studies will be reported further.

A study which concentrates on the students' attitude in the context of medical science is the qualitative study of Ogilvie, Trusk, and Blue (1999), in which the students readily accepted computer exams and their study habits were influenced in a positive manner. Also, Dermo (2009) revealed that the most positive aspect of e-assessment in the eyes of students is its benefits in teaching and learning. Both ordinary students and students with disabilities preferred the computer-based tests to the pa-

per-based types of exams, believing they performed better in CBA (Flowers, Kim, Lewis, & Davis, 2011).

Recently, Faniran and Ajayi (2018) studied students' attitudes towards CBA in Africa; they reported that students found it easier and preferable to take CBA, holding that internet connectivity and the mode of item presentation are the two important challenges in CBA. Although many studies have reported a positive attitude toward CBA, there is also evidence of neutral attitudes that should further be considered. For example, in their study, Dembitzer et al. (2018) reported comments from students that computer-based test was neither better nor worse than regular tests. Likewise, J.-Y. Kim (2015), in her perceptual typology of student attitudes toward CBA, classified users into four types: (I) CBA dissatisfaction type, (II) CBA friendly type, (III) adjustment seeker type, and (IV) CBA apprehensive type. As can be seen in this classification, despite the capabilities of electronic testing, the viewpoint of certain students is not positive regarding such types of tests.

Given the importance of electronic tests and students' attitude towards them, the present study aimed to investigate students' attitudes toward electronic tests with especial attention to instant feedback.

Addressing the feedback is important because despite the foregoing benefits associated with feedback, some reports have indicated that 50% of the students attend only to incorrect answers and 25% percent do not even pay attention to the feedback at all (Timmers & Veldkamp, 2011). Kulik, Kulik, and Morgan, as cited in Maier et al. (2016), reported 0.26 effect sizes for feedback, meanwhile, 18 out of the 58 studies reported a negative effect size for feedback.

The present research is an attempt to explain students' feelings about electronic tests, determine the benefits of e-testing from their point of view, and specify the disadvantages of e-testing from the students' stand point with especial attention to feedback. As reported above, some studies have examined students' attitudes using quantitative approaches where little attention has been paid to feedback, whereas it is necessary to study students' attitudes using a qualitative approach, because a qualitative study can provide a deeper understanding of the immediate feedback in the computer-based assessment arena. Using a qualitative approach, the current study seeks to gain a deeper insight into the field of computer-based assessments, and provide an answer to the following research question:

Research Question: How do students perceive the e-test in general, and how do they perceive the immediate feedback in particular?

METHOD

To answer the research question, a pilot study was used. Pilot study refers to mini versions of a full-scale study or is a small scale version of the main study (Van Teijlingen & Hundley, 2001). This pilot study is part of a more comprehensive study that seeks to examine in depth students' attitude towards feedback on the electronic test using case study and phenomenological methods. Y. Kim (2011) has outlined the importance of a pilot study in conducting a phenomenological study; it helps researchers to find issues and barriers related to participants and also it helps them to modify interview questions.

THE CONTEXT AND THE PARTICIPANTS

In the current research, 40 students were selected from the Faculty of Educational Science and Psychology at Birjand University, a governmental university in eastern Iran, with more than 1,300 students, most of whom are Persian-speaking Iranians.

The students were selected using purposeful sampling which, according to Gall, Borg, and Gall (1996) is a type of sampling in which the selected samples are conducive to the research objectives. They further introduced 15 types of sampling, one of which is criterion sampling, which is used in the current investigation. In this method, the criterion is formed by the researcher. We considered

two criteria for sample selection, one of which is that students have taken at least two electronic tests. The second criterion is student heterogeneity in terms of academic performance. Applying the criteria, 40 students were selected as samples, among which 23 were men and 17 were women who were junior college students, aging between 19 and 21. It is to be noted that the subjects were Educational Science students who had experienced two teacher-made multiple-choice electronic tests in the Moodle Learning Management System (LMS) in a computer lab in the middle and at the end of the semester, with grades varying from “A” (top score) to “F” (fail).

All students were interviewed using a structured interview approach, with open-ended and comprehensible questions, including:

- In general, what is your opinion about electronic testing?
- What are the capabilities of electronic testing in your opinion?
- What are the limitations of electronic testing in your opinion?
- How did you feel when you immediately saw your test results?

It is worth noting that, according to the classification of feedback reported in Maier et al. (2016), simple feedback, which includes the knowledge of the result, was used instead of elaborate feedback. The e-tests were related to an introduction to computer course where participants had no prior computing experience.

According to Gall et al. (1996), the data analysis process in a phenomenological study is similar to that used in a case study, where the researcher seeks the meaning units and themes through interview transcripts. As discussed in the methodology section, this research is going to use the phenomenological method in the next phase, in this regard, the qualitative content analysis method presented by Graneheim and Lundman (2004) was employed to analyze students’ transcripts. In this approach, meaning units (interview transcripts in our study) were transformed into condensed meaning units, from which the codes were further extracted and categorized into subcategories, categories and finally, the main theme was extracted. According to Kohlbacher (2006) “the object of qualitative content analysis can basically be any kind of recorded communication, i.e., transcripts of interviews/discourses, protocols of observation, video tapes, written documents in general etc.” Therefore, qualitative content analysis approach was selected for analyzing the recorded transcripts of the students. In order to develop categories and subcategories, inductive content analysis was used; according to Elo and Kyngäs (2008), in the inductive content analysis, the concepts are derived from the data; in the deductive content analysis, on the other hand, previous knowledge is the basis of the analysis. The categories in this research were extracted from data, hence an inductive approach was adopted.

In qualitative research, various strategies have been reported for obtaining credibility. One strategy is member checking, in which the researchers’ interpretations of the data are shared with that of the participants who have the opportunity to discuss and clarify the interpretation (Baxter & Jack, 2008). Member checking was further utilized in this study to ensure the validity of the findings; therefore, the findings, codes, categories, subcategories and the main theme were shared with the students, and the interpretations were also re-examined.

RESULTS

As mentioned in the introduction, the present study seeks to answer the following question:

How do students perceive the e-test in general, and how do they perceive the immediate feedback in particular?

As discussed in the methodology section, according to Graneheim and Lundman (2004), in qualitative content analysis, the first step is to extract the condensed meaning unit of the meaning unit and assign codes to them. Some examples of students’ statements (meaning unit) are reported as follows.

Students' Perceptions of the Strengths and Limitations of Electronic Tests

For the sake of brevity, the process of code extraction from condensed meaning unit is presented in Table 1:

Table 1. Examples of meaning units, condensed meaning units and code

Meaning unit	Condensed meaning unit	Code
In spite of the difficulty associated with electronic tests, they are much more interesting than paper-based exams (Case 1).	- Electronic tests are difficult. - Electronic tests are very interesting.	1. Perceived difficulty 2. Perceived interest
In electronic tests, because the test score is immediately presented after the test, if the test score is not expected, it will discourage the students and affect the subsequent tests (Case 5).	- The test score is immediately presented -It will discourage the students	1. Instant feedback 2. Discouragement
Although, with regards to technology advances, electronic tests are interesting, they are not suited to all courses (Case 7).	- Electronic tests are interesting - It is not suitable for all courses	1. Perceived interest 2. Incompatible
Electronic tests necessitate that students be familiar with computers. Yet not all students have the ability to work with computers (Case 10).	- Electronic tests require computer skills	1. Requiring familiarity with technology 2. The challenge of unfamiliarity with computers
- It is useful to conduct the test electronically, before conducting test students should become familiar with it (Case 26)	-Electronic tests are useful -Students should become familiar with it	1. Perceived usefulness 2. The challenge of unfamiliarity with computers
- Electronic tests are very good as they create focus on the exam. On the other hand, in the electronic test, the score is less affected by the mentality of the teacher (Case 30).	-The test is very good. - More focus on the exam -Less affected by the mentality of the teacher	1. Good feeling 2. Concentration 3. Objectivity
- The use of this test method is appropriate for other courses(Case 34)	-Appropriate for other lessons	1. Perceived appropriateness for other courses
- Computer is one of the most important skills in everyday life. In line with the advancement of technology, conducting tests electronically is useful, practical and interesting (Case 37).	-Electronic tests improve computer skills	1. Improving technological skills
- Because of the stress that overcomes the electronic test conditions, the test result may be different from the P&P test, yet it seems appropriate as it is new and diverse (Case 39).	- Stress in electronic test conditions - It is new and diverse. - It seems appropriate.	1. Intense stress 2. Divers and new experience 3. Perceived appropriateness

As can be seen in Table 1, certain codes are repeated, so all codes and their frequency are reported in Table 2. In order to clarify the process of code extraction, the first line of the Table 1 is hereby elucidated:

Case 1 in the interview stated that 'In spite of the difficulty associated with electronic tests, they are much more interesting than paper-based exams'. This statement is a meaning unit which reduced to two condensed meaning units:

1. Electronic tests are difficult.
2. Electronic tests are very interesting.

As can be seen in the meaning unit, the statement has two hidden contradictory meanings; first, the feeling is that this type of test is difficult, and second, that this sort of testing is interesting. These condensed meaning units have transformed into two codes:

1. Perceived difficulty
2. Perceived interest

It should be mentioned that the reported codes in the third column of Table 1 are just examples, and the full list of codes is reported in Table 2.

Table 2. Codes extracted from meaning units

Code	Frequency	Code	Frequency
Instant feedback	22	Diverse and new experience	2
First experience	10	Having more benefits than other tests	2
Perceived difficulty	10	High speed	2
Intense stress	8	Interest in discovering	2
Less stress	8	Absence of physical fatigue	2
Improved technological skills	6	Negative feeling	2
Lack of time	6	No cheating	2
Physical damage (eye strain)	6	Objectivity	2
Positive feeling	6	Opportunity to retrieve mistakes	2
Saving money	6	Perceived appropriateness	2
Saving time	6	Perceived interest	2
Anxiety challenge and execution concerns	4	The challenge of not getting used to	2
Insurance of the test results	4	The challenge of unfamiliarity with computers	2
Practical use of computers	4	Unfamiliarity with test	2
Self-assessment	4	Useful evaluation method	2
Pleasantness	4	Concentration	1
Assuming all students are the same	2	Incompatible	1
Being special	2		
Discouragement	2		
Difficulty of revision	2		

As can be seen in Table 2, “instant feedback” is perceived as the most frequent code which gained students' attention in this qualitative study; this code will be discussed further in detail. First experience is another code reported by students. As can be seen, students have considered e-test more difficult than paper and pencil tests. A contradictory code was “less stress” against “intense stress”, meaning some students believe electronic assessment increase their stress, while some believe it decreases stress.

Another extracted code expressed by the students is the hidden benefits of taking electronic tests. Students believe that taking an electronic test would increase their computer skills and knowledge.

Six students have stated in their interviews that it takes a lot of time to read and answer the electronic questions; they indirectly compare CBA with paper and pencil assessments. In other words, they struggle with reading texts on computer screens.

The explanation of all these codes requires in depth discussion; therefore, after discussing the most important of these codes, according to Graneheim and Lundman (2004) approach, they will be integrated into categories, subcategories and themes. Such categorization provides more insight into the professional and practitioner in this field; accordingly, codes, sub-categories, categories and a theme are presented in Table 3.

The results of the qualitative content analysis reported in Table 3 show that students' attitudes towards electronic test can be summarized in one theme, 2 categories and 9 sub-categories.

Generally, the more prominent understanding of students from their electronic test experience is that they perceived it as an opportunity to assess their learning process, although certain challenges were considered for such assessment. The challenges causing negative feelings among students are instant feedback, stress, unfamiliarity and physical damage. It should be noticed all these challenges are interconnected.

Students in this study considered high stress as a major challenge of electronic tests due to unfamiliarity with technology and test conditions. They believe that because of instant feedback, these types of tests create a stressful condition. The examinee who fails in the exam receives immediate feedback, leading to discouragement in trying for other exams.

Eyestrain was perceived as another challenge for electronic tests. Fatigue, dry eyes or how students sit in front of computer screens may cause eyestrain; therefore, this challenge is not merely limited to electronic testing, but it seems to be intensified in the stressful conditions of testing. In exam conditions, where the examinee needs to focus deeply, symptoms of eyestrain cause difficulty in focusing, a challenge interconnected with yet another subcategory, called "unfamiliarity". Unfamiliarity of examiners with safety issues in using computers like sitting behind computers, adjusting the distance of the eye to the screen, color settings and resolution and so on, exacerbates the problem.

A number of findings in the current study are related to instant feedback; as observed in Table 3, instant feedback is perceived as both an opportunity and a challenge. The following case is an example where instant feedback is deemed as a challenge.

"Providing instant feedback causes a part of mind to concentrate on the final results, which [negatively] affects the performance."

In contrast, the following statement considers instant feedback as an opportunity:

"The electronic test provides a better feeling and reduces the stress of paper and pencil tests, and seeing the results immediately after the exam is very productive."

Although other findings of the current study can be found in the literature, this contrary perception of students about instant feedback is new, considerable, and interesting, generating more research questions, hence the selection of "*feedback on the electronic test; opportunity or challenge*" as the main theme for this study.

DISCUSSION

Given the importance of users' perceptions of each technology based on the technology acceptance model proposed by Davis (1989), the attitude of the students participating in the electronic test was examined in this study as a new evaluation method using qualitative research method. This study showed that students' attitude towards electronic test is positive in general, consistent with the findings of Debuse and Lawley (2016), where students and educators enjoyed the quality and efficiency of computer-based assessment. Tella and Bashorun (2012) in Nigeria have also shown that the attitudes of the examinee are positive towards electronic testing, where most of the students preferred electronic tests to paper and pencil tests, believing this type of test as having a positive effect on their academic performance. Ogilvie et al. (1999), confirming the finding of this study, found that students' attitudes toward PC-based testing were positive, which further parallels the results in the literature (Chien et al., 2014; Yurdabakan & Uzunkavak, 2012).

Some challenges were observed in the current study. According to the students' statements, unfamiliarity with technology may negatively affect students' performance in e-assessment. This challenge was reported earlier and examined in the study of Clariana and Wallace (2002). Lack of time, classified under unfamiliarity subcategory, is confirmed by literature, which shows that computer-based

applications increase the response time compared to paper-based ones (Yurdabakan & Uzunkavak, 2012). Lack of time is closely related to the problem of reading speed on the monitor (Rostaminezhad, 2018).

Eye strain and stress are two other challenges associated with the current study; however, as reported earlier, the notable finding in this study which requires more attention is the equivocal attitude towards feedback. Certain students perceived feedback as a source of stress and discouragement, hence a challenge; on the contrary, others perceived it as an opportunity to review mistakes and improve self-assessment, hence positively affecting their performance. Students' positive attitudes to feedback is also reported in the study of Debus and Lawley (2016), where they revealed that students' views positively favored a feedback process. Students who did not have a positive attitude towards feedback were able to explain the low and sometimes negative effect size for feedback. As reported in the meta-analysis of Kulik, Kulik, and Morgan (as cited in Maier et al., 2016), they reported 0.26 effect sizes for feedback meanwhile, 18 of the 58 studies have had a negative effect size. It should be kept in mind that the reported effect size is not significant, since according to Gall, Borg, and Gall (1996) the effect size of less than 0.33 is not significant in meta-analysis research. It can be argued though, that the negative attitude of some students towards feedback can explain the negative effect size; therefore, it can be concluded that one of the causes of low effect size or even the negative effect of feedback can be the negative attitude of students.

This phenomenon can be viewed in terms of individual differences. As many areas of education are influenced by individual differences, feedback in e-assessments may also be influenced by individual differences. In their study, Maier et al. (2016) reported certain individual differences which influenced feedback behavior, including students' prior knowledge, performance, motivational beliefs, working memory capacity and gender.

CONCLUSIONS AND IMPLICATIONS

The current study provides several conclusions and implications for technology-based assessment theory and practice. First, although instant feedback provides a self-assessment opportunity for students, it may become a challenge by weakening students' hope, especially in students who have poor performance in the test. Instant feedback can also be challenging for students with good academic performance, because they are concerned about the outcome of the test during the test. As a result, this concern may have a negative impact on their academic performance. This finding somewhat challenges the theoretical base of technology-based assessments, because these theories have reported instant feedback as the most important capability of technology-based assessments.

Secondly, this finding can justify any resistance towards integrating technology into the assessment process since more resistant students are those who perceive feedback as a challenge, hence the necessity of changing students' attitudes towards feedback prior to integrating technology in assessment.

Thirdly, teachers can use this finding for designing and developing e-tests in their formative and summative assessments and select the best feedback strategies for their assessments. This research will help teachers to select and use electronic tests with deeper insight and will help them to consider its limitations. According to the findings of the current study about feedback, the personalization of electronic tests based on the preferred type of feedback can be considered in teachers' agenda when they want to give electronic tests.

This study generates new questions about feedback for future research. This study found that instant feedback is not good or bad per se; therefore, it is necessary for researchers to find in what conditions it is effective and when it is not; for whom it is good and for whom it is bad; and how the negative effects of instant feedback can be reduced. Does instant feedback increase exam anxiety? These types of questions are questions that can be examined using case study or phenomenological study in future research.

This study, like any other research, has encountered some limitations; first, this research was limited to immediate feedback, and did not address attitudes to latent feedback and other types of feedback. Second, the current research was limited to multiple-choice questions and did not examine other types of questions like true and false or matching questions. Third, the participants in the research did not have much computer literacy; the findings may differ for those with higher computer literacy skills. Fourth, the feedback in this study has been limited to simple verification feedback; other types such as elaborate feedback and motivational feedback have not been investigated. It is consequently necessary to consider these limitations in the interpretation and generalization of the findings of the current study.

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Students' Perceptions of the Strengths and Limitations of Electronic Tests

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