



"تقييم نظام التصحيح الإلكتروني للإختبارات الموضوعية بجامعة المنصورة: من وجهة نظر أعضاء هيئة التدريس الأكاديميين"

**Evaluation of Electronic Correction System for Objective Tests at
Mansoura University: Academic Faculty Members' Perspective**

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المستخلص

الخلفية: تُعد جامعة المنصورة من أوائل الجامعات المصرية التي إعتمدت التصحيح الإلكتروني للإمتحانات، حيث أطلقت نظاماً إلكترونياً جديداً لإدارة الإختبارات الموضوعية "الاختبار من متعدد"، "الصواب والخطأ"، إلا أن هذا النظام يواجه العديد من التحديات. وفي الحقيقة يُعد تقييم رضا أعضاء هيئة التدريس عن الإجراءات الفعلية المُطبقة في نظام التصحيح الإلكتروني للإختبارات الموضوعية بجامعة المنصورة حلاً دقيقاً وفعالاً لقياس كفاءة هذا النظام.

الأهداف: معرفة معدل رضا أعضاء هيئة التدريس عن واقع إجراءات تطبيق نظام التصحيح الإلكتروني للإختبارات الموضوعية بجامعة المنصورة.

المنهجية: يستخدم هذا البحث مقياس رضا أعضاء هيئة التدريس والذي يشمل أربعة أبعاد رئيسية: **البعد الأول** هو جاهزية بيئة نظام التصحيح الإلكتروني للإختبارات الموضوعية. **البعد الثاني** هو جودة الواجهة الرسومية لنظام التصحيح الإلكتروني للإختبارات الموضوعية. **البعد الثالث** هو دقة نظام التصحيح الإلكتروني في تصحيح الإختبارات الموضوعية. **البعد الرابع** هو طرق نظام التصحيح الإلكتروني في عرض نتائج تصحيح الإختبارات الموضوعية.

النتائج: أظهرت النتائج أن معدل رضا أعضاء هيئة التدريس عن إجراءات تطبيق نظام التصحيح الإلكتروني للإختبارات الموضوعية بجامعة المنصورة كان مرتفعاً في بُعدي "كفاءة طرق وأساليب عرض النتائج"، "جودة واجهة النظام"، بينما كان متوسطاً في بُعدي "جاهزية بيئة التصحيح الإلكتروني"، "دقة عمليات التصحيح الإلكتروني".

الكلمات المفتاحية: نظام التصحيح الإلكتروني، الإختبارات الموضوعية، عدالة تقييم الطلاب، رضا مطوري البرمجيات، إختبار صلاحية الإستخدام، إختبار الكفاءة.

Abstract

The tremendous technological development during the current era has led to major and multiple changes in various areas of human life, making it known as the era of digitalization. The current technological dizzying speed

has placed education at the heart of personal and societal development and the imperative to confront these developments.

Evaluation is one of the most important pillars of the educational process at any educational stage, as it is used to sort students and determine their progress and academic achievement. By reforming evaluation systems, components of the educational system, including teachers, learners, and curricula, can be reformed. The reality is that the education and learning system cannot flourish under traditional evaluation systems that focus on measuring the cognitive aspect only and neglect measuring other aspects of learning, such as social interaction, motivation, emotional competencies, and skill development.

In higher education, faculty members face a lot of pressure at the end of each semester because they have to correct hundreds of students' papers within a day or two of the exam, which, in terms of time and effort, is undoubtedly a demanding task. Therefore, we urgently need an electronic correction system for tests in university institutions.

In fact, Mansoura University is one of the first Egyptian universities to adopt electronic exam correction, as it launched a new electronic system for managing objective exams (multiple choice and true/false), which includes everything from scheduling the test to releasing the findings in various faculties to ensure integrity and transparency and reduce the human intervention in the process of student evaluation.

As evaluating the degree of faculty members' satisfaction with the reality of the procedures applied in the electronic correction system at Mansoura University has not received sufficient attention from academic study and research, the purpose of this research paper was to identify the viewpoints of faculty members on the actual procedures for implementing the electronic correction system for objective tests at Mansoura University, as

well as to identify the degree of variations in satisfaction levels based on gender type (males vs. females) and the type of faculty study (practical vs. theoretical).

The first finding of the obtained results showed that the degree of satisfaction of faculty members with the reality of the procedures for implementing the Mansoura University E-Correction System is grounded in high values for the dimensions of displaying results and quality of the user interface and is grounded in moderate values for the dimensions of readiness of the E-Correction Environment and accuracy of the E-Correction Operations. The second finding of the obtained results indicated that there were differences between the frequencies of faculty members' responses to the items of the satisfaction scale with the reality of the procedures for implementing the Mansoura University E-Correction System in favor of the response to a degree of a large and moderate. The third finding of the obtained results demonstrated that there were no statistically significant differences between the average scores of faculty members due to the type of faculty member gender. The fourth finding of the obtained results revealed that there were no statistically significant differences between the average scores of faculty members due to the type of college study.

Lastly, the study recommended the necessity for continuous development of the electronic correction system for objective tests at Mansoura University to make it more thorough and impartial.

Keywords: Quality of Educational System, E-Correction System, Objective Tests, Academic Faculty Members, Student Evaluation Fairness, Software Developer Satisfaction, Validity Test, Reliability Test.

1. Introduction

With the tremendous technological progress, a large number of education experts called for the necessity of employing modern digital technology in the education system to improve learning outcomes and to develop the educational sector as a whole (Balat et al, 2020). These calls have received great responses with the emergence of the Coronavirus (Covid-19), which has significantly changed education around the world, where many schools and universities have begun to adapt new internet-based technologies instead of traditional pen-and-paper methods (Abdelsalam et al, 2023).

As soon as the World Health Organization announced that the Coronavirus (Covid-19) was a global deadly pandemic and would continue for an unknown period of time, the views of educational institutions in various countries of the world differed, where some countries have relied entirely on E-Learning to effectively deliver knowledge to students in a short period of time and with less effort, as it uses different modern communication tools, such as computers, networks, multimedia, audio-visual means, graphics, portable devices, search engines, and digital libraries (Ahmed et al, 2021). On the other hand, with the end of the first wave of the Covid-19 pandemic, the Egyptian government decided that it would adopt the blended learning approach, which combines traditional face-to-face learning with E-Learning, both synchronous and asynchronous, with full commitment to preventive measures and social distancing (Erfan et al, 2023).

Traditionally, examination is the most common means of evaluating students' knowledge and abilities (Adebayo et al, 2014). Various methods of student examination have been proposed over the past few decades, the majority of these methods were first based on the conventional paper and pencil format, but as information technology advanced, they switched to a

computerized format based on the Internet in order to accommodate the massive increase in student enrollment, as is the case in Egyptian universities (Rashad et al, 2010). Now, as a result of digital transformation, electronic examinations (E-Exams) have become an essential part of the distance education system (El-Feshawy et al, 2023), because they provide more flexibility than traditional assessment methods, as the test can be taken at different times and locations by students and also help simplify the exam system, because all operations are done through the computer device, including automatic marking, which reduces complex paperwork (Abass et al, 2017).

Mansoura University is considered one of the first universities to implement an electronic system for automated correction of student examinations, where at the beginning of 2019, it innovated a new electronic system for automatic correction of the multiple-choice exam in the university's various colleges, called "E-Correction" to ensure integrity and transparency during the exam, moreover the sustained efforts of the university administration did not only stop there, but rather conducted training programs for faculty members to provide them with the knowledge, skills, and positive attitudes that enable them to design objective tests based on accurate scientific foundations, in terms of firstly correcting misconceptions about objective tests and electronic correction, secondly formulating selection questions, thirdly learning how to prepare an answer form, fourthly learning the major steps of E-Correction via computer without human intervention (Source: Mansoura University E-Website).

The remaining parts of the paper are arranged as follows: The study problem is defined in Section 2. The study significance is given in Section 3. The objectives of the study are presented in Section 4. The study questions are provided in Section 5. The hypotheses of the study are determined in

Section 6. The boundaries of the study are identified in Section 7. The theoretical background of the Mansoura University E-Correction System is covered in Section 8. The major related literature is surveyed in Section 9. The study materials and methodology are presented in Section 10. The study findings and discussion are presented in Section 11. The study recommendations are outlined in Section 12. Finally, the study conclusion is presented in Section 13, followed by future improvement plans.

2. Problem of the Study

With the emergence of the Covid-19 pandemic, the Ministry of Higher Education in Egypt issued official directives to employ all infrastructure and strategies to use technology to avoid disrupting the educational process and to confront the serious challenges imposed by this devastating epidemic. In this context, to ensure continuity of the education process during the second semester of the academic year 2019/2020, the Egyptian university education institutions have widely used E-Learning, either independently or blended with the traditional education system.

Since Mansoura University is one of the major citadels of education in Egypt, it was keen to developing all systems related to the educational and learning process, including student evaluation systems, as it invented the electronic correcting system called "E-Correction," which aims to correct objective tests of various types, electronic and paper, in a way that ensures the integrity and fairness of the exam correction and saves time and effort.

Since software systems are ultimately human-made, they are not free of shortcomings and defects, so this research paper analyzes the E-Correction System of Mansoura University to determine the pros and cons and future improvement plans.

3. Significance of the Study

The significance of the current study lies in the following:

- Shedding light on the importance of modern technology and an attempt to keep pace with digital transformation in improving the quality of administration of university education tests, especially in the field of electronic correction of exams, which contributes to achieving the quality of the educational process entirely.
- Helping the university to review its policies in the field of electronic correction of objective tests and making some organizational decisions that would help in developing electronic correction systems for objective tests.
- Spreading the culture of using electronic correction systems for objective tests among faculty members in Egyptian universities for producing questions, monitoring grades, and announcing results in record times compared to the methods previously used, and making it easy for faculty members to extract results, achieving justice and reducing exam complaints and grievances.
- Keeping up with modern educational trends that focus on the necessity of obtaining the satisfaction of faculty members with the student evaluation process, i.e., the procedures for implementing the electronic correction system for tests, and not just focusing on obtaining their satisfaction in the educational aspect.
- Directing the attention of university officials to preparing and developing training programs to qualify faculty members to prepare high-level exams and use the electronic correcting system, as the application of the current electronic correcting system is performed without training any member of these groups, and this has serious negative repercussions on the education system in general and the evaluation system in particular.

- Providing university officials with accurate information about the extent of satisfaction of faculty members and support staff with the electronic correcting system for objective tests currently used in their university faculties.
- Helping university officials to make the appropriate decision regarding whether or not to implement this type of system and to make the decisive decision to move towards preparing a complete system for electronic correction in the future.

4. Objectives of the Study

The objectives of the current study are as follows:

- Knowing the degree of satisfaction of faculty members with the reality of the procedures for implementing the electronic correction system for objective tests at Mansoura University.
- Detecting differences between the frequencies of responses of faculty members on the items of the satisfaction scale regarding the reality of procedures for implementing the electronic correction system for objective tests at Mansoura University.
- Identifying the extent to which the degree of satisfaction of faculty members with the reality of the procedures for implementing the electronic correcting system for objective tests at Mansoura University varies according to the gender of the sample members (males/females) and the type of the study at the university faculty (theoretical/practical).
- Identifying the most important obstacles and problems that limit the activation of the application of the electronic correction system for objective tests from the point of view of faculty members at Mansoura University.
- Finding a set of mechanisms and improvements to develop the application of the electronic correcting system for objective tests from the point of view of faculty members at Mansoura University.

5. Questions of the Study

Although Mansoura University has implemented an electronic system for correcting objective tests in a large number of its colleges, there are major concerns from some faculty members regarding the application of this system. For this reason, there was a need to evaluate the experience of Egyptian Universities, especially Mansoura University. Then, the problem of the current research can be formulated in the following questions:

- What is the degree of satisfaction of faculty members with the reality of the procedures for implementing the electronic correction system for objective tests at Mansoura University ?
- Are there differences between the frequencies of faculty members' responses to the satisfaction scale items and the reality of the procedures for implementing the electronic correcting system for objective tests at Mansoura University ?
- Does the degree of satisfaction of faculty members with the reality of the procedures for implementing the electronic correcting system for objective tests at Mansoura University differ according to the gender (males/females) of the sample members ?
- Does the degree of satisfaction of faculty members with the reality of the procedures for implementing the electronic correcting system for objective tests at Mansoura University differ according to the type of study in the college (theoretical/practical) ?
- What are the obstacles to implementing the electronic correction system for objective tests from the point of view of faculty members at Mansoura University ?
- What are the mechanisms and improvements to activate the developed versions of the electronic correction system for objective tests from the point of view of faculty members at Mansoura University ?

6. Hypotheses of the Study

A hypothesis is an intellectual guess by the researcher that seeks to explain the phenomenon in light of the factors associated with it. The current study hypotheses are as follows:

- There are statistically significant differences between the frequencies of faculty members' responses to the satisfaction scale items and the reality of the procedures for implementing the E-Correction System for objective tests at Mansoura University.
- There are statistically significant differences between the average scores of faculty members regarding the extent of their satisfaction with the reality of the procedures for implementing the electronic correction system for objective tests at Mansoura University due to the type of gender (males/females).
- There are statistically significant differences between the average scores of faculty members regarding the extent of their satisfaction with the reality of the procedures for implementing the electronic correction system for objective tests at Mansoura University due to the nature of the faculty (theoretical/ practical).

7. Boundaries of the Study

The current research is limited by a number of limits within which the results can be generalized. The most important of these limits are the following:

• Objective Borders

The current research topic is to evaluate the satisfaction of faculty members with the reality of the procedures for implementing the E-Correction System for objective tests and the obstacles to its application at

Mansoura University, taking into account some of the demographic variables that affect the research variables.

- **Human Borders**

The current research sample consists of a group of faculty members at Mansoura University, which includes two classes: a number of faculty members from within the electronic control who work on the system directly and a number of faculty members from outside the electronic control who deal with the system indirectly.

- **Location Borders**

The current research was performed in some faculties at Mansoura University.

- **Time Limits**

The current research was conducted in the academic year 2025/2026 AD.

8. E-Correction System at Mansoura University

By analyzing the Mansoura University's Electronic Correction System, it's observed that the procedures of that system can be divided into two main phases: Pre-Exam and Post-Exam. Each phase includes a number of Graphical User Interfaces (GUIs) developed by a professional group of software developers at the Technology Center of Mansoura University. Below, we delve deeper into the details of these GUIs.

A) Pre-Exam Phase

The primary goal of this phase is to determine the tasks that need to be completed before conducting the objective examinations in various faculties of Mansoura University. Several GUIs from Mansoura University's E-

Correction System related to this phase will be presented in the following discussions:

In order to start the objective test design process, the website for designing objective tests, which is the first component of Mansoura University's E-Correction System, must be accessed from within the electronic correction control or from another location.

Once the link of the Mansoura University's E-Correction System website (<https://bsheet.mans.edu.eg/>) is opened in any internet browser– Google Chrome is recommended– by a faculty member working in the electronic correction control, the screen depicted in Figure 1 appears to verify the faculty member's identity.



Figure 1. The screenshot for window of accessing Mansoura University's E-Correction System
(Source: Mansoura University's E-Correction Website)

From the above screen, when the login data is entered correctly, the screen depicted in Figure 2 appears to display the main screen of the Mansoura University's E-Correction System.

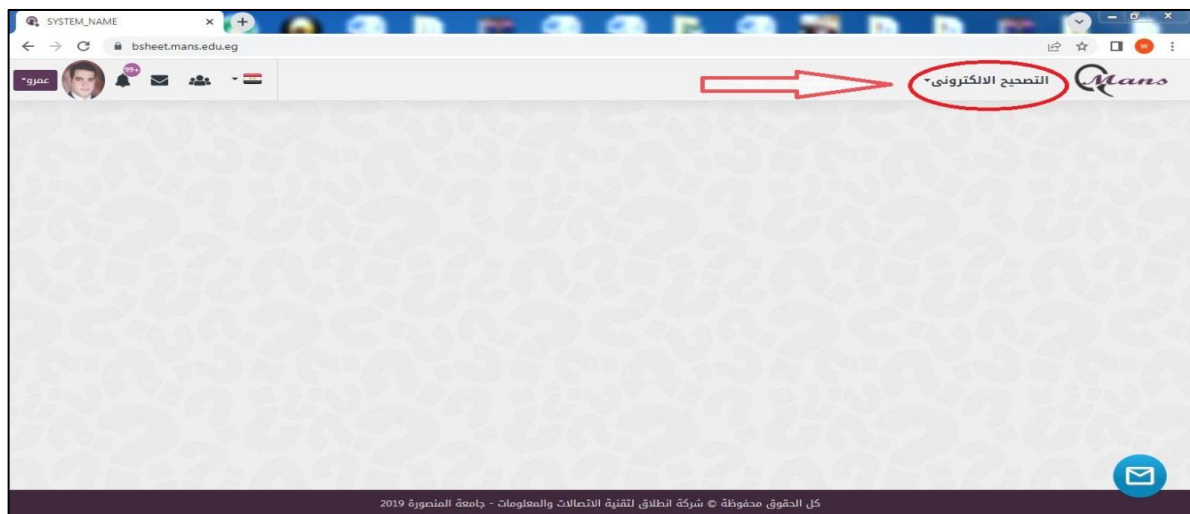


Figure 2. The screenshot for window of navigating Mansoura University's E-Correction System
(Source: Mansoura University's E-Correction Website)

From the above screen, when the selected navigation menu is pressed, the screen depicted in Figure 3 appears to start the process of creating an objective test with the Mansoura University's E-Correction System.

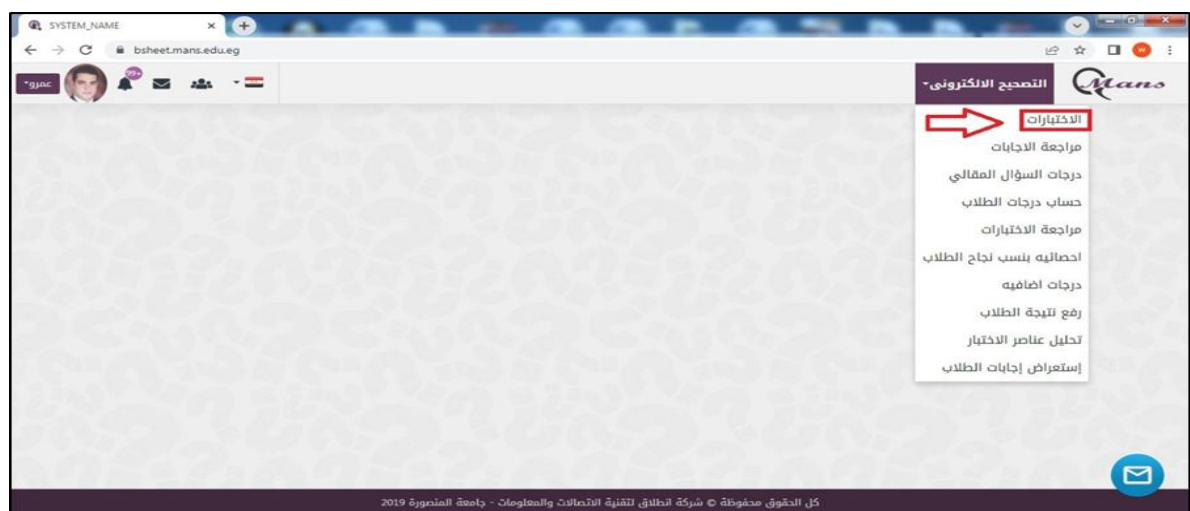


Figure 3. The screenshot for window of designing an objective test using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the selected option is pressed, the screen depicted in Figure 4 appears to determine the scientific department and the academic year.

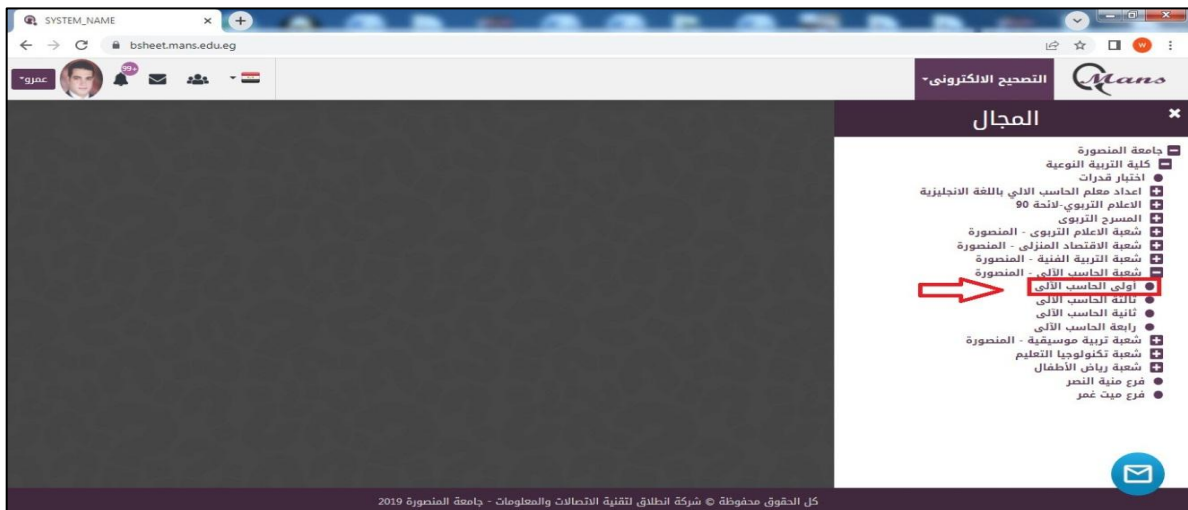


Figure 4. The screenshot for window of selecting department and academic year using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the selected option is pressed, the screen depicted in Figure 5 appears to choose the desired course.

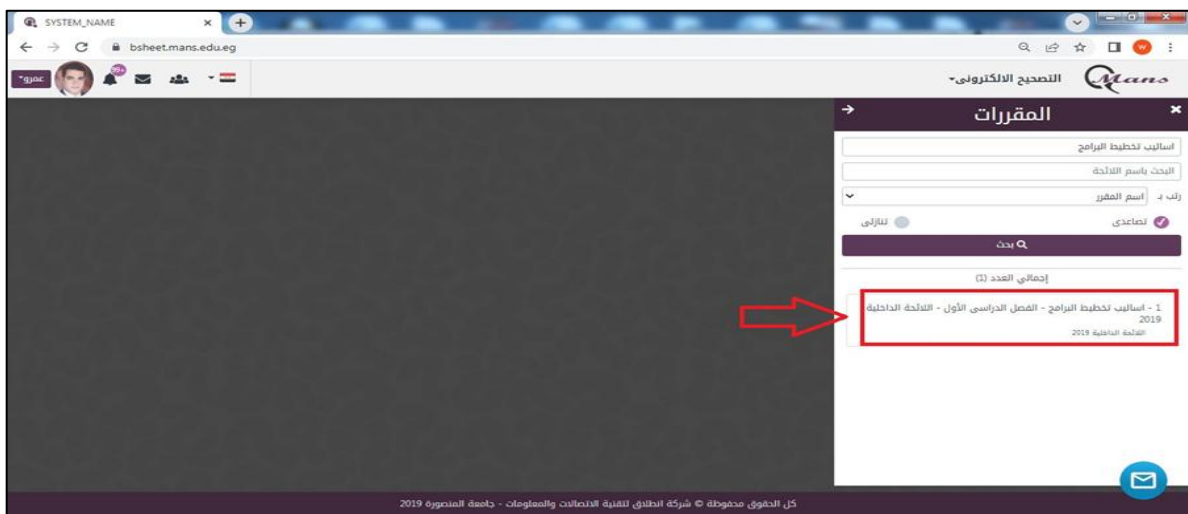


Figure 5. The screenshot for window of selecting target course using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the selected option is pressed, the screen depicted in Figure 6 appears to enable the faculty member to design a new objective test for the course that was previously specified.



Figure 6. The screenshot for window of adding new objective test using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the selected option is pressed, the screen depicted in Figure 7 appears to specify the details of the new objective test.

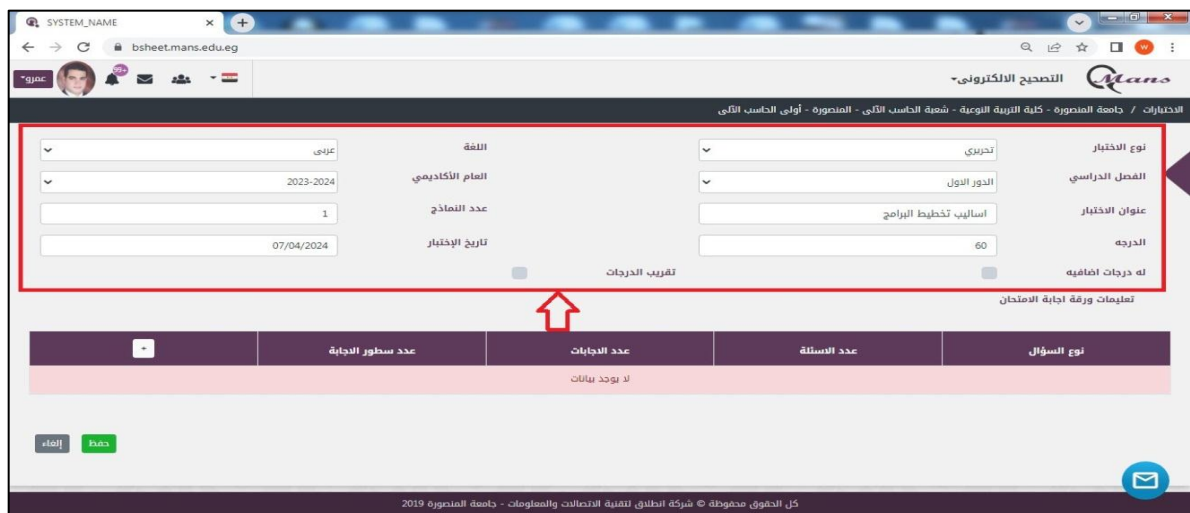


Figure 7. The screenshot for window of determining details of new objective test using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the identification of the objective test elements is completed, the screen depicted in Figure 8 appears to determine the type of the new objective test questions.

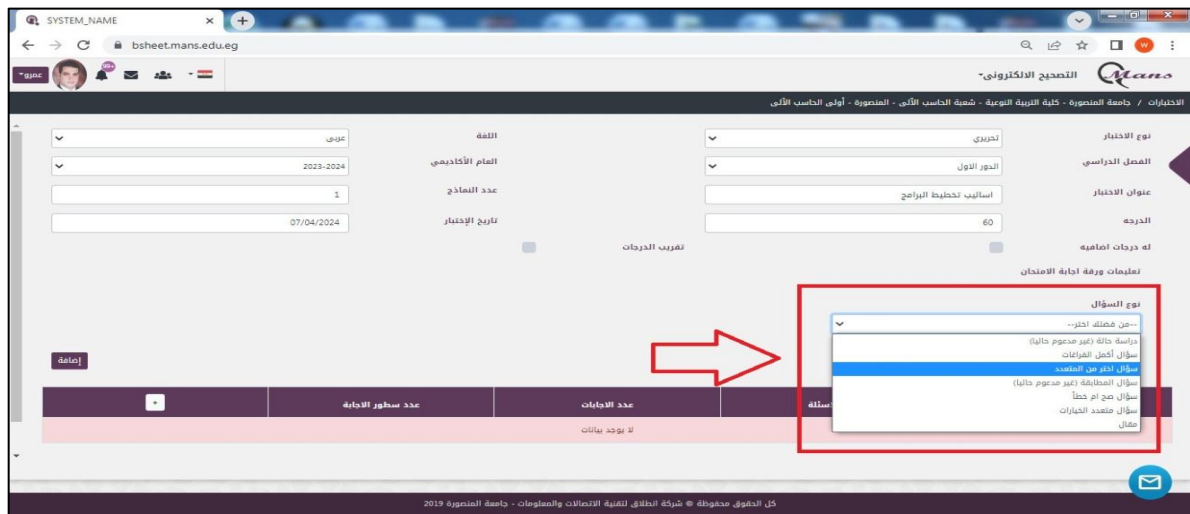


Figure 8. The screenshot for window of determining question types of new objective test using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the selected option is pressed, the screen depicted in Figure 9 appears to determine the details of the Multiple Choice Question (MCQ).

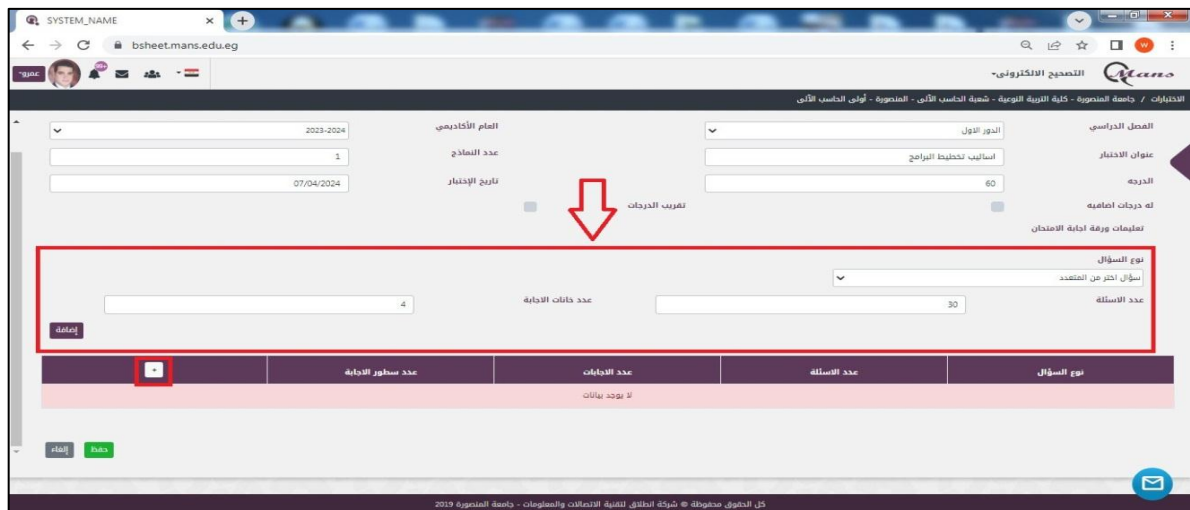


Figure 9. The screenshot for window of selecting MCQ of new objective test using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the MCQ are identified, the screen depicted in Figure 10 appears to determine the details of the True or False Question (T/FQ).

The screenshot shows the 'الاصحاح الإلكتروني' (Electronic Correction) section of the Mansoura University's E-Correction System. The interface is in Arabic and includes a header with the university logo and name. Below the header, there are several input fields for user information and test details. A red box highlights a table with the following data:

نوع السؤال	عدد الأسئلة	عدد الاجابات	عدد سطور الاجابة
سؤال نختار من المتعدد	30	4	-
سؤال صح ام خطأ	30	-	-

Below the table, there are two buttons: 'إضافة' (Add) and 'حفظ' (Save). A red arrow points to the 'حفظ' button.

Figure 10. The screenshot for window of selecting T/FQ of new objective test using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the T/FQ are identified, the screen depicted in Figure 11 appears to save the objective test designed by Mansoura University's E-Correction System.

The screenshot shows the 'الاصحاح الإلكتروني' (Electronic Correction) section of the Mansoura University's E-Correction System. The interface is in Arabic and includes a header with the university logo and name. Below the header, there are several input fields for user information and test details. A red box highlights a table with the following data:

نوع السؤال	عدد الأسئلة	عدد الاجابات	عدد سطور الاجابة
سؤال نختار من المتعدد	30	4	-
سؤال صح ام خطأ	30	-	-

Below the table, there are two buttons: 'إضافة' (Add) and 'حفظ' (Save). A red arrow points to the 'حفظ' button.

Figure 11. The screenshot for window of saving the designed new objective test using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

B) Post-Exam Phase

The primary goal of this phase is to determine the activities that must be carried out after conducting the objective examinations. Several GUIs from Mansoura University's E-Correction System related to this phase will be presented in the following discussions:

To start the automated correction procedures, the second component of the Mansoura University's E-Correction System, which is the E-Correction software installed on the computer device designated for electronic correction at the electronic correction control of the faculty must be opened. This component allows scanning the students' answer sheets obtained from the sub-control, as well as the paper model answer obtained from the faculty member responsible for setting the exam. Then, the pre-designed objective test for the intended course is opened, and the answer from the tab is selected to determine the score of each MCQ as shown in the screen depicted in Figure 12.

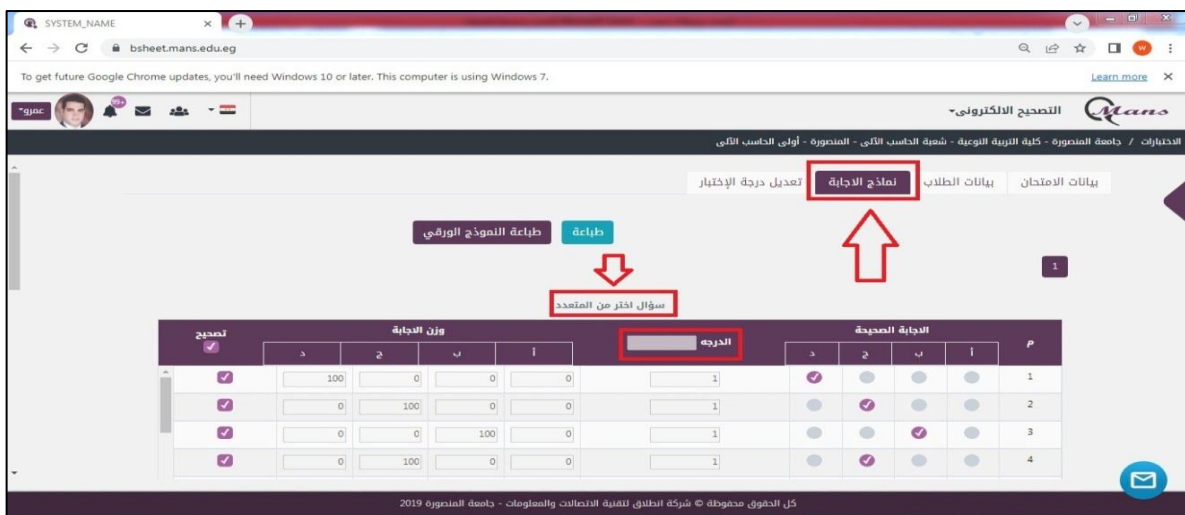


Figure 12. The screenshot for window of scoring each MCQ using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the score of each MCQ item is entered in the textbox specified for that purpose, the sidebar is scrolled down to

determine the score of each T/FQ as shown in the screen depicted in Figure 13.

الدرجة	خطأ	صح	P
1	✓	●	1
1	✓	●	2
1	✓	●	3
1	✓	●	4
1	●	✓	5
1	●	✓	6
1	●	✓	7

مجموع الدرجات 40

Figure 13. The screenshot for window of scoring each T/FQ using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the score of each T/FQ is entered in the textbox specified for that purpose, the modifications are saved and the answer form is closed. Then, the screen depicted in Figure 14 appears to review the students' answers to exclude the incorrect ones, such as choosing two answers together for the same question, etc.

الحالة	الفصل الدراسي	العام الأكاديمي	النوع	عدد الطلاب	عنوان الاختبار
لا يوجد بيانات					

Figure 14. The screenshot for window of reviewing students' answers using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the answers review process is completed, the screen depicted in Figure 15 appears to calculate the results of the students' answers.

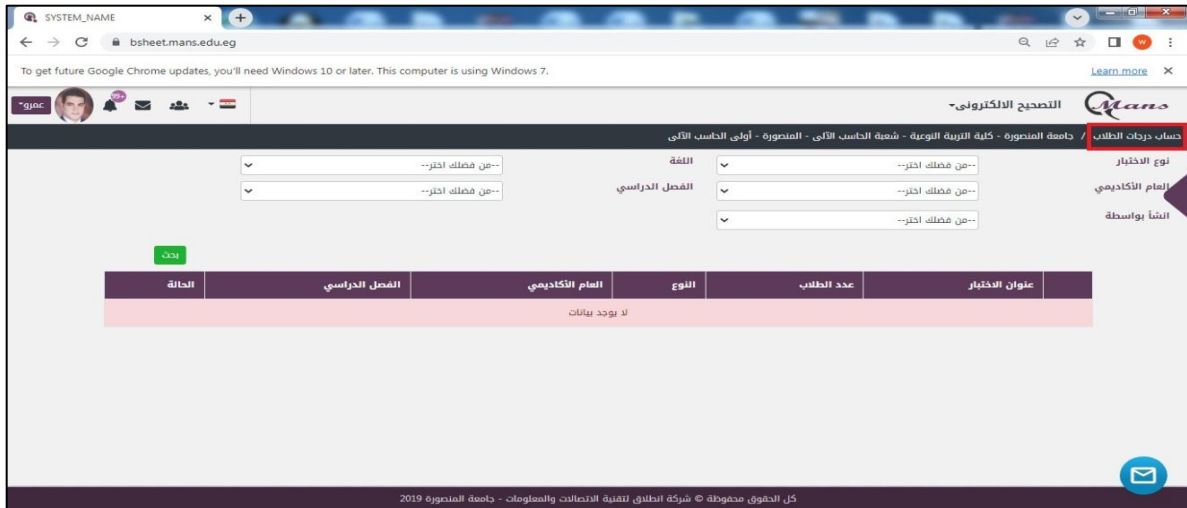


Figure 15. The screenshot for window of calculating students' results using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the answers calculation process is completed, the screen depicted in Figure 16 appears to review the items of the new objective test.

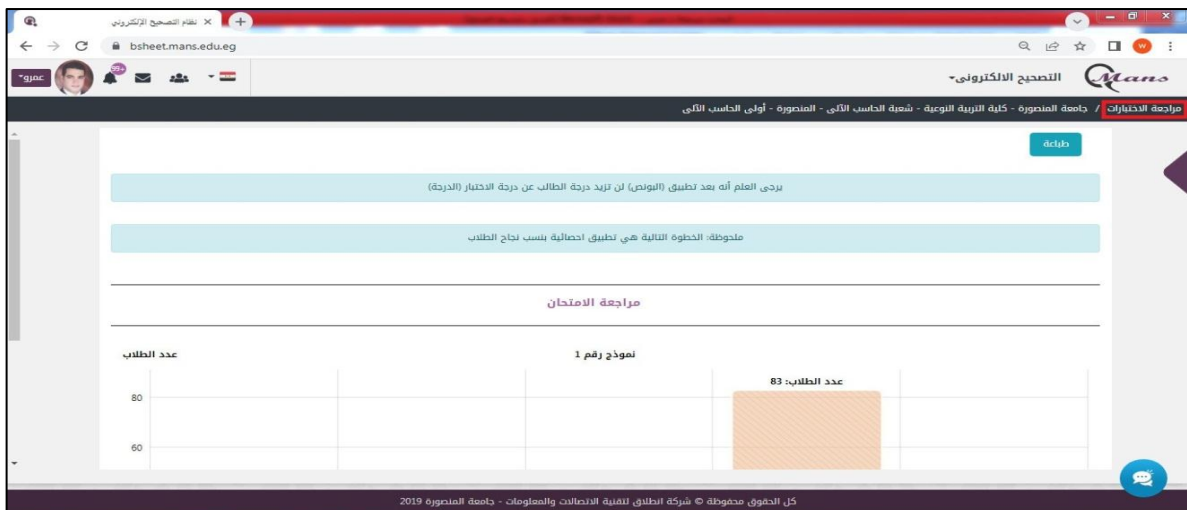


Figure 16. The screenshot for window of reviewing the designed new objective test using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the new objective test review process is completed, the screen depicted in Figure 17 appears to display a graphical representation with statistics of the students' results.



Figure 17. The screenshot for window of graphing statistics of students' results using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the students' outcomes statistic is displayed, the screen depicted in Figure 18 appears to add extra degrees for all students in case of a logical reason, such as repeating a specific question with the same formula and answer choices more than once.

عنوان الاختبار	عدد الطلاب	النوع	المادة الأكاديمية	الفصل الدراسي	الحالة
لا يوجد بيانات					

Figure 18. The screenshot for window of gaining additional degrees using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the obtaining additional degrees process is completed, the screen depicted in Figure 19 appears to enable printing and exporting the students' results to the relevant sub-control.



The screenshot shows a web browser window with the URL 'bsheet.mans.edu.eg'. The page title is 'التصحيح الإلكتروني' (Electronic Correction). The main content area displays a table with the following columns: 'رقم التسجيل' (Registration Number), 'اسم الطالب' (Student Name), 'رقم شئون الطالب' (Student Affairs Number), 'الرقم القومي' (National ID Number), 'رقم الجلوس' (Seating Number), 'درجة الامتحان' (Exam Grade), 'الدرجة المعاملة' (Treated Grade), 'درجات البوندي' (Bondi Grades), and 'الدرجة الكلية' (Total Grade). The table contains 8 rows of student data.

Figure 19. The screenshot for window of printing and exporting students' results using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the process of printing and exporting students' results is finished, the screen depicted in Figure 20 appears to analyze the items of the new objective test.



The screenshot shows a web browser window with the URL 'bsheet.mans.edu.eg'. The page title is 'التصحيح الإلكتروني' (Electronic Correction). The main content area displays a table with the following columns: 'رقم السؤال' (Question Number), 'معدل الصعوبة' (Difficulty Level), 'معامل التمييز' (Discrimination Coefficient), 'أ', 'ب', 'ج', 'د', and 'معدل' (Average). The table contains 9 rows of test item data.

Figure 20. The screenshot for window of analyzing the designed new objective test items using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

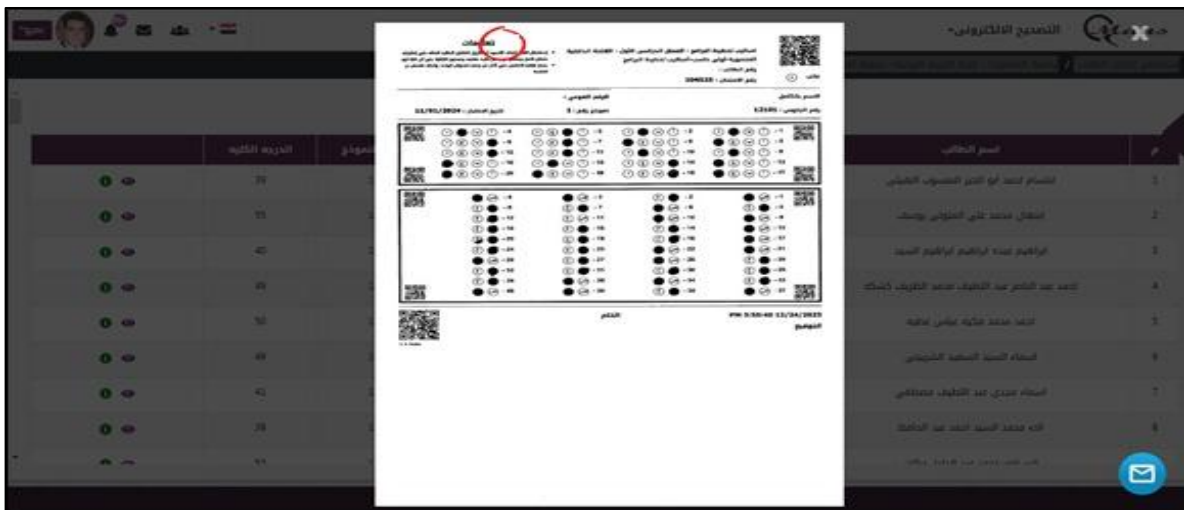
From the screen above, when the process of analyzing the new objective test items is completed, the screen depicted in Figure 21 appears to review the students' responses to the new objective test.



الاسم الطالب	رقم سؤال الطالب	الرقم القياسي	رقم التوضيح	الدولة الكلية	الاسم الطالب
1	12001	1	39	1	1
2	12002	2	35	2	2
3	12003	3	40	3	3
4	12004	4	49	4	4
5	12005	5	50	5	5
6	12006	6	49	6	6
7	12007	7	40	7	7
8	12008	8	38	8	8
9	12009	9	40	9	9

Figure 21. The screenshot for window of reviewing students' responses using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

From the above screen, when the selected option is pressed, the screen depicted in Figure 22 appears to display the answer sheet of the chosen student.



الاسم الطالب	رقم سؤال الطالب	الرقم القياسي	رقم التوضيح	الدولة الكلية	الاسم الطالب
1	12001	1	39	1	1
2	12002	2	35	2	2
3	12003	3	40	3	3
4	12004	4	49	4	4
5	12005	5	50	5	5
6	12006	6	49	6	6
7	12007	7	40	7	7
8	12008	8	38	8	8
9	12009	9	40	9	9

Figure 22. The screenshot for window of displaying student's answers using Mansoura University's E-Correction System (Source: Mansoura University's E-Correction Website)

9. Literature Review

A literature review is an essential section of scientific research, because it provides a theoretical background for the subject of the study by giving a clear vision of the most recent advancements made by researchers in the field. In this context, the most significant earlier research on the topic of the current study will be displayed in chronological order in Table 1.

Table 1: A list of the relevant previous studies

Author(s)	Publication Year	Abstract
Divya, R., & Kumar, M	2014	The study aimed to firstly automate the entire examination assessment process instead of doing it humanly by enabling correction on PC using both online or offline mode and secondly to enhance the security process. In the context of this research, the system proceeds through a series of steps to perform a justice electronic assessment while improving security to avoid the leakage of questions prior to the examination and preventing the manipulation of critical data. The study concluded that the proposed system achieved a high level of accuracy in classifying and evaluating, optimized the human effort, and reduced the overall time consumed in the examinations process (Divya & Kumar, 2014).
Hanifi, A	2019	The study aimed to investigate the teachers' attitude to the use of electronic evaluation as a means to evaluate students' performance progress and also aimed to shed light on other aspects of electronic assessment, which are still in a limited experimental stage and need improvement in various departments of Algerian Universities. In the context of this research, an opinion poll form was designed and

		applied via the Internet to 16 teachers who were randomly selected from various Algerian Universities. The study concluded that, the majority of teachers agreed that the electronic evaluation system can replace the paper evaluation system because it saves a lot of teacher time and energy and helps them to provide high-quality courses (Hanifi, 2019).
Nassar, S.M., El-Naggar, M.S., & Said, H. K	2019	The study aimed to evaluate the readiness of the faculty members at Cairo University, Egypt, for implementing the E-assessment system. In the context of this research, a valid and reliable questionnaire was created based on a 5-item Likert scale to assess technical readiness for Computer-Based Assessment (CBA). In addition, the average score of 3.41 was considered the minimum acceptable level of readiness for each component or construct, and indicative colors were used to indicate the level of readiness: 1-2.6 = red color (not ready and needs hard work), >2.6-3.4 = orange color (not ready and needs some work), >3.4-4.2 = yellow color (ready but needs some improvements), and >4.2-5.0 = green color (ready, go ahead). In practice, the prepared opinion survey tool was applied to 307 faculty members and teaching assistants belonging to three colleges: Agriculture, Physical Therapy, and Dar Al-Ulum. The obtained results showed that the vast majority of faculty members own a smart device, and their basic skills in using computers and the Internet are highly satisfactory, and thus they are easily able to connect to the Internet. The study concluded that faculty members and teaching assistants at Cairo University are not yet

		technically ready to implement CBA, thus a lot of effort and more scientific studies must be conducted to confirm the validity of this topic (Nassar et al, 2021).
Huda, S.S. M., Kabir, M.D., & Siddiq, T	2020	The study aimed to investigate students' opinions and reactions regarding the effectiveness of electronic assessment in higher education. In the context of this research, a small sample of university students was selected to survey their opinions about the most important benefits they received from switching from the traditional education evaluation system to the electronic evaluation system. The study concluded that the majority of students have concerns about E-assessment, as they do not all have an equal level of IT competence; thus, more research should be conducted to explore other aspects of E-assessment in the context of higher education (Huda, 2020).
Petrova, T., Ivanova, M., & Naydenova, I	2020	The study aimed to present the developed model for evaluating the quality of online assessment activities in the form of quizzes considering the students' point of view that is published and discussed in scientific papers and the position of students from the Technical University of Sofia, College of Energy and Electronics (CEE). In the context of this research, evaluating E-Assessment processes remains a major challenge, as it includes in its folds a large number of research problems, such as the relationship between content, structure, and presentation of learning and evaluation elements; the effect of learning methods on evaluation objects; the type of presented feedback and its relation to the received knowledge. The study concluded that it is

		difficult for students to ask specific questions and obtain the answers to the fullest through the Internet; thus Internet-based tests now represent a major challenge not only for students but also for teachers that is due to a number of difficulties that are very hard to overcome (Petrova, 2020).
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General Comments on Previous Studies

We deduced by extrapolating earlier research that those studies were more concerned with evaluating the efficacy of electronic assessments in higher education institutions than with the electronic correction process and its procedures. As a result, we found a large number of scientific studies that addressed issues related to the evaluation of online assessment systems in Universities, whereas there were relatively few that addressed issues related to the evaluation of electronic correction systems in Universities. This indicates the originality of the current study and its critical role in determining pros, cons, and improvements of the E-Correction System at Mansoura University in the Arab Republic of Egypt.

10. Methodology of the Study

This study was conducted, in which the views of faculty members at Mansoura University were evaluated regarding the real procedures performed to correct objective tests using the E-Correction System at Mansoura University. Information about the study approach, study sample, data collection tool, statistical data analysis, and how to apply the test is presented below:

❖ Study Approach

The current study falls under descriptive study, which aims to describe the characteristics of a specific society or a specific situation, with the aim of

obtaining sufficient and accurate information about it without interfering in its causes or controlling them. Practically speaking, the study relied on the descriptive approach to review previous related scientific studies and the theoretical background of the study.

❖ Study Sample

The study was applied to a non-probabilistic intentional sample of academic faculty members at Mansoura University. The total number of the study sample was 50 academic faculty members. Some of them belong to theoretical faculties (such as education, specific education, commerce, arts, etc.), while others belong to practical faculties (such as medicine, computers and information, engineering, etc.). The numerical description of the study sample is shown in Table 2.

Table 2: The characteristics of the study sample

		Gender		Total
		Male	Female	
Faculty	Theoretical	14	16	30
	Practical	11	9	20
Total		25	25	50

❖ Study Timetable

The study was conducted during the academic year 2025/ 2026 AD.

❖ Data Collection Tools

After reviewing the theoretical framework and the previous studies related to the current research field, a faculty member satisfaction scale was prepared regarding the reality of the procedures of the E-Correction System for objective tests at Mansoura University. It was taken into account that the

scale statements should be short, clear, have specific meaning, and not contain more than one idea.

The scale statements were in a positive direction and divided into four aspects. The first aspect is the readiness of the E-Correction System environment. The second aspect is the quality of the E-Correction System user interface. The third aspect is the ability of the E-Correction System to correct objective tests. The fourth aspect is the accuracy of the E-Correction System and the methods of displaying results.

The scale was constructed on a Likert scale. The respondents have an option to mark one out of three alternatives spanning from "Agree" to "Disagree" to express their thought. The scores for these alternatives were (3-2-1), respectively.

According to (Yuniarti et al, 2020), following the completion of the initial version of the assessment instrument, the work should continue to verify whether the assessment tool fulfills the criteria of validity and reliability. Hence, in the following, we will explain the procedure of determining the validity and reliability of the suggested assessment instrument.

▪ **Validity Test**

The validity criterion refers to the ability of the assessment instrument to accurately measure what it is supposed to measure (Erlinawati & Muslimah, 2021). To determine the validity of the proposed assessment instrument, we followed the arbitration approach, in which the initial draft of the proposed assessment instrument was presented to a group of arbitrators specialized in the topic of the current study to explore their opinions. The outcomes of this test revealed that the arbitrators agreed on the validity of the suggested assessment instrument for use with 88% agreement. In this context, all their suggestions were performed to become in its final form.

▪ Reliability Test

The reliability criterion refers to the extent to which the assessment instrument yields the same results when used repeatedly under similar conditions (Gallagher et al, 2003). To determine the reliability of the proposed assessment instrument, we followed the test-retest method, in which a pre-test was applied to a sample of 10% of the study population, and then the test was repeated on a sample of 15% of the respondents three weeks after the initial test. The outcomes of this test revealed that the proposed assessment instrument possesses a high degree of reliability, as its reliability coefficient of 0.92 falls within the acceptable range specified by the authors of research paper (Tavakol & Dennick, 2011), in which the authors stated that the acceptable value for the reliability coefficient ranges from 0.70 to 0.95. On the other hand, it is classified as a very high value according to the research paper (Yuniarti et al, 2020), in which the authors classified the reliability coefficient into levels as shown in Table 3 below.

Table 3: The classification of the reliability coefficient

Reliability Coefficient (r)	Interpretation
$0.00 \leq r < 0.20$	Very Low
$0.20 \leq r < 0.40$	Low
$0.40 \leq r < 0.70$	Moderate
$0.70 \leq r < 0.90$	High
$0.90 \leq r \leq 1.00$	Very High

11. Research Findings and Discussion

At the beginning, it should be noted that the level of faculty member satisfaction was calculated based on the range of responses as shown in Table 4 and according to the following steps:

- Calculating the range, which is the difference between the score

$$= 31 =$$

assigned to the highest response and the score assigned to the lowest response, i.e., $3 - 1 = 2$.

- Determining the length of the satisfaction class by dividing the calculated range by the required number of classes to be formed (low, moderate, high), i.e., $2/3 = 0.67$.
- Forming satisfaction classes, where the first class produces a low satisfaction degree by adding the length of the class to the degree assigned to the lowest response, i.e., $1 + 0.67 = 1.67$, to be from 1 to less than 1.67, then the second class produces a moderate satisfaction degree from 1.67 to less than 2.34, and the third class produces a high satisfaction degree from 2.34 to 3.

Table 4: The classification of the faculty member satisfaction based on participants' responses

Range	Satisfaction Level
$1 \leq r < 1.67$	Low
$1.67 \leq r < 2.34$	Moderate
$2.34 \leq r \leq 3$	High

The results of testing the validity of the hypotheses will be discussed as follows:

▪ Results of the First Hypothesis

The first hypothesis states that "There are statistically significant differences between the frequencies of faculty members' responses to the satisfaction scale items on the real procedures of implementing the E-Correction System for objective tests at Mansoura University".

To verify the truthfulness of the first hypothesis across the four dimensions of the proposed scale, frequencies and percentages for the three responses of the proposed scale (Agree, Neutral, Disagree) were used, and the arithmetic average and standard deviation were computed to determine

the degree of satisfaction and ranking and relative importance. After that, Chi-Square (X^2) values and indication levels were calculated to determine the differences between the frequencies of the items of the proposed faculty member satisfaction scale regarding the procedures followed in applying the E-Correction System for objective tests.

The statistical factual outcomes of the responses of the chosen sample of faculty members around the readiness of the electronic correction environment are shown in Table 5, around the quality of the system's graphical interface are appeared in Table 6, around the system's ability to correct objective tests are displayed in Table 7, and around the accuracy of the electronic correction system's results and statistics are presented in Table 8.

Table 5: The results of the faculty members' responses regarding the readiness of the Mansoura University's E-Correction Environment to correct objective tests (n = 50)

Response Alternatives													
Item							Average	Standard Deviation	Satisfaction Degree	Ranking	Relative Importance	X ²	Indication Level
	Agree		Neutral		Disagree								
	F	%	F	%	F	%							
1	5	10.0	5	10.0	40	80.0	1.30	0.647	Low	8	43.3	49.0	0.01
2	1	2.0	8	16.0	41	82.0	1.20	0.452	Low	10	40	54.8	0.01
3	4	8.0	10	20.0	36	72.0	1.36	0.631	Low	6	45.3	34.7	0.01
4	6	12.0	0	0	44	88.0	1.24	0.657	Low	9	41.3	28.9	0.01
5	7	14.0	3	6.0	40	80.0	1.34	0.717	Low	7	44.7	49.5	0.01
6	8	16.0	8	16.0	34	68.0	1.48	0.762	Low	5	49.3	27	0.01

7	44	88.0	4	8.0	2	4.0	2.84	0.468	High	4	94.7	67.4	0.01
8	48	96.0	2	4.0	0	0	2.96	0.198	High	2	98.7	42.3	0.01
9	6	12.0	0	0	44	88.0	1.24	0.657	Low	9 Repeated	41.3	28.9	0.01
10	47	94.0	3	6.0	0	0	2.94	0.240	High	3	98	38.7	0.01
11	50	100.0	0	0	0	0	3.00	0.000	High	1	100	-	0.01
12	44	88.0	4	8.0	2	4.0	2.84	0.468	High	4 Repeated	94.7	67.4	0.01
13	8	16.0	8	16.0	34	68.0	1.48	0.762	Low	5 Repeated	49.3	27	0.01
14	6	12.0	0	0	44	88.0	1.24	0.657	Low	9 Repeated	41.3	28.9	0.01

It is clear from the results of the previous table that the responses of the selected sample of faculty members regarding the reality of the readiness of the E-Correction Environment indicated that there were statistically significant differences in the statements (7, 8, 10, 11, 12) in favor of the option "Agree," where all values of (X^2) were significant at the indication level (0.01). And the statements (1, 2, 3, 4, 5, 6, 9, 13, 14) in favor of the alternative "Disagree," where all values of (X^2) were significant at the indication level (0.01).

As for the arrangement of these expressions in relation to their relative importance, we note the following:

- The phrase (11), which is "Soft copies of the blank answer forms are available in the electronic correction control for use when needed," came in first place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (100%).
- The phrase (8), which is "An official paper copy of the electronic correction control formation is available," came in second place in the ranking of phrases that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (98.7%).
- The phrase (10), which is "Paper copies of the blank answer forms for each course are available at the electronic correction control in preparation for filling out by the hand of a faculty member," came in third place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (98%).
- The phrase (7), which is "The basic requirements for electronic correction control include inks, ballpoint pens, pencils, cutters, rubber bands, adhesives, etc.," came in fourth place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (94.7%).
- The phrase (12), which is "Paper reports are available to formally deliver the answer form to the head of sub-controls," came in repeated fourth place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (94.7%).
- The phrase (6), which is "There are a sufficient number of modern printers and scanners with electronic correction control, and they are maintained periodically," came in fifth place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment,

as its relative importance reached (49.3%).

- The phrase (13), which is "The answer sheets are printed with a poor print quality," came in repeated fifth place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (49.3%).
- The phrase (3), which is "There is a special waiting room for sub-control members to sit in during correction," came in sixth place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (45.3%).
- The phrase (5), which is "Mechanical ventilation systems are available in electronic correction control," came in seventh place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (44.7%).
- The phrase (1), which is "There is a modern office for electronic correction in the college," came in eighth place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (43.3%).
- The phrase (4), which is "Natural ventilation sources are available in electronic correction control," came in ninth place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (41.3%).
- The phrase (9), which is "An official paper copy of starting responsibilities assigned to each member of the E-Correction control is available," came in repeated ninth place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (41.3%).
- The phrase (14), which is "An official paper copy of finishing responsibilities assigned to each member of the E-Correction control is

available," came in repeated ninth place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (41.3%).

- The phrase (2), which is "Modern office furniture is available for electronic correction control members," came in tenth place in the ranking of statements that indicate the reality of the readiness of the electronic correction environment, as its relative importance reached (40 %).

To discuss the results of the first hypothesis with regard to the first dimension of the proposed scale, "Readiness of the E-Correction Environment," it becomes clear that the first hypothesis was achieved to a large extent, as there were differences in the frequencies of faculty members' responses to the items of the proposed satisfaction scale of the real procedures of implementing the E-Correction System for objective tests at Mansoura University in favor of the alternative "Disagree". This means that faculty members are dissatisfied with the environment of the E-Correction System due to the lack of the necessary requirements for modern digital control, such as a modern office for electronic correction with good equipment, a modern office foundation, air conditioners, printers, scanners, etc.; the lack of places for sub-control members to stand during the correction process; and the lack of official paper copies to begin and finish the tasks assigned to every faculty member in E-Correction control; answer sheets are printed poorly.

Table 6: The results of the faculty members' responses regarding the quality of the user interface of the Mansoura University's E-Correction System to correct objective tests (n = 50)

Item	Response Alternatives						Average	Standard Deviation	Satisfaction Degree	Ranking	Relative Importance	X ²	Indication Level
	Agree		Neutral		Disagree								
	F	%	F	%	F	%							
1	5	10.0	5	10.0	40	80.0	1.30	0.647	Low	6	43.3	49.0	0.01
= 37 =													

= ٣٧ =

2	29	58.0	7	14.0	14	28.0	2.30	0.886	Moderate	5	76.7	15.2	0.01
3	30	60.0	8	16.0	12	24.0	2.36	0.851	High	4	78.7	16.5	0.01
4	48	96.0	1	2.0	1	2.0	2.94	0.314	High	2	98	88.4	0.01
5	43	86.0	4	8.0	3	6.0	2.80	0.535	High	3	93.3	62.4	0.01
6	50	100.0	0	0	0	0	3.00	0.000	High	1	100	-	0.01
7	50	100.0	0	0	0	0	3.00	0.000	High	1 Repeated	100	-	0.01

It is clear from the results of the previous table that the responses of the selected sample of faculty members regarding the graphical user interface quality of the Mansoura University E-Correction System indicated that there were statistically significant differences in all statements in favor of the alternative "Agree," where all values of (X^2) were significant at the indication level (0.01), with the exception of statement No. (1), in which the differences were in favor of the alternative "Disagree".

As for the arrangement of these expressions in relation to their relative importance, we note the following:

- The two phrases (6, 7), which are "It is easy to control the screens of the electronic correction system by zooming in and zooming out" and "It is easy to exit the electronic correction system," came in first place in the ranking of statements that indicate the quality of the user interface of the electronic correction system to correct objective tests, as their relative importance reached 100%).
- The phrase (4), which is "The lines of the electronic correction system are readable," came in second place in the ranking of statements that indicate the quality of the user interface of the electronic correction system

to correct objective tests, as their relative importance reached (98%).

- The phrase (5), which is "It is easy to navigate between the screens of the electronic correction system," came in third place in the ranking of statements that indicate the quality of the user interface of the electronic correction system to correct objective tests, as their relative importance reached (93.3%).
- The phrase (3), which is "The colors of the electronic correction system are consistent," came in fourth place in the ranking of statements that indicate the quality of the user interface of the electronic correction system to correct objective tests, as their relative importance reached (78.7%).
- The phrase (2), which is "The interface of the electronic correction system is good from an aesthetic point of view," came in fifth place in the ranking of statements that indicate the quality of the user interface of the electronic correction system to correct objective tests, as their relative importance reached (76.7%).
- The phrase (1), which is "The interface of the electronic correction system is well designed from a technical point of view," came in sixth place in the ranking of statements that indicate the quality of the user interface of the electronic correction system to correct objective tests, as their relative importance reached (43.3%).

To discuss the results of the first hypothesis with regard to the second dimension of the proposed scale, "The quality of the user interface of the E-Correction System," it becomes clear that the first hypothesis was achieved almost completely, as there were differences in the frequencies of faculty members' responses to the items of the proposed satisfaction scale with respect to the real procedures of implementing the electronic correction system for objective tests at Mansoura University in favor of the alternative "Agree". This means that the faculty members are satisfied with the graphical

user interface of the E-Correction System, as it has been well designed by professional programmers at the university's technology center.

Table 7: The results of the faculty members' responses regarding the ability of the Mansoura University's E-Correction System to correct objective tests (n = 50)

Item	Response Alternatives						Average	Standard Deviation	Satisfaction Degree	Ranking	Relative Importance	X ²	Indication Level
	Agree		Neutral		Disagree								
	F	%	F	%	F	%							
1	48	96.0	0	0	2	4.0	2.92	0.396	High	1	97.3	42.9	0.01
2	40	80.0	6	12.0	4	8.0	2.72	0.607	High	2	90.7	31	0.01
3	38	76.0	2	4.0	10	20.0	2.56	0.812	High	4	85.3	30.5	0.01
4	38	76.0	2	4.0	10	20.0	2.56	0.812	High	4 Repeated	85.3	46.4	0.01
5	35	70.0	5	10.0	10	20.0	2.50	0.814	High	6	83.3	33.8	0.01
6	9	18.0	6	12.0	35	70.0	1.48	0.789	Low	8	49.3	27	0.01
7	39	78.0	2	4.0	9	18.0	2.60	0.782	High	3	86.7	41.1	0.01
8	6	12.0	8	16.0	36	72.0	1.40	0.700	Low	9	46.7	24.8	0.01
9	8	16.0	8	16.0	34	68.0	1.48	0.762	Low	8 Repeated	49.3	8.3	0.01
10	7	14.0	5	10.0	38	76.0	1.38	0.725	Low	10	46	42.9	0.01
11	33	66.0	11	22.0	6	12.0	2.54	0.706	High	5	84.7	31	0.01
12	10	20.0	14	28.0	26	52.0	1.68	0.794	Low	7	56	30.5	0.01

It is clear from the results of the previous table that the responses of the selected sample of faculty members regarding the ability of the Mansoura University E-Correction System to correct objective tests indicated

that there were statistically significant differences in the statements (1, 2, 3, 4, 5, 7, 11) in favor of the option "Agree," where all values of (X^2) were significant at the indication level (0.01). And the statements (6, 8, 9, 10, 12) in favor of the alternative "Disagree," where all values of (X^2) were significant at the indication level (0.01).

As for the arrangement of these expressions in relation to their relative importance, we note the following:

- The phrase (1), which is "The electronic correction system generates different secret login data for all members of the electronic correction control," came in first place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (97.3%).
- The phrase (2), which is "It is easy to finish the process of printing educational courses after students take the exam," came in second place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (90.7%).
- The phrase (7), which is "The electronic correction system is characterized by high speed," came in third place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (86.7%).
- The phrase (3), which is "It is easy to scan the courses that students examined and also the answer form in preparation for the extraction process," came in fourth place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (85.3%).
- The phrase (4), which is "It is easy to extract the students' answers and also the answer form in preparation for the export process," came in

repeated fourth place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (85.3%).

- The phrase (11), which is "The electronic correction system provides quick assistance when needed," came in fifth place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (84.7%).
- The phrase (5), which is "It is easy to export the students' answers and also the answer form in preparation for the correction process," came in sixth place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (83.3%).
- The phrase (12), which is "The electronic correction system provides technical support through members of the Technology Center at Mansoura University," came in seventh place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (56%).
- The two phrases (6, 9), which are "The system user carrying out the correction procedure must follow the order of correction steps" and "The stages of electronic correction are few and simple," came in eighth place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (49.3%).
- The phrase (8), which is "The faculty's Internet is fast enough to allow the correction process to be completed very quickly," came in ninth place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (46.7%).

- The phrase (10), which is "The system appears to have few error messages," came in tenth place in the ranking of statements that indicate the ability of the electronic correction system to correct objective tests, as its relative importance reached (46%).

To discuss the results of the first hypothesis with regard to the third dimension of the proposed scale, "The ability of the Mansoura University E-Correction System to correct objective tests," it becomes clear that the first hypothesis was achieved to a certain extent, as there were differences in the frequencies of faculty members' responses to the items of the proposed satisfaction scale with respect to the real procedures of implementing the electronic correction system for objective tests at Mansoura University in favor of the alternative "Agree". This means that the faculty members are satisfied with the corrective capacity of the electronic correction system, with some notes on the stages and steps of the correction process, as there are relatively many and therefore require an experienced member in dealing with the system in order to accomplish the correction steps.

Table 8: The results of the faculty members' responses regarding the accuracy of the Mansoura University's E-Correction System outcomes to correct objective tests (n = 50)

Item	Response Alternatives						Average	Standard Deviation	Satisfaction Degree	Ranking	Relative Importance	X ²	Indication Level
	Agree		Neutral		Disagree								
	F	%	F	%	F	%							
1	44	88.0	3	6.0	3	6.0	2.82	0.523	High	3	94	67.2	0.01
2	47	94.0	3	6.0	0	0	2.94	0.240	High	2	98	38.7	0.01
3	37	74.0	9	18.0	4	8.0	2.66	0.626	High	4	88.7	37.9	0.01
4	8	16.0	9	18.0	33	66.0	1.50	0.763	Low	5	50	24	0.01
5	50	100.0	0	0	0	0	3.00	0.000	High	1	100	–	0.01

It is clear from the results of the previous table that the responses of the selected sample of faculty members regarding the accuracy of results and statistics of the Mansoura University E-Correction System to correct objective tests indicated that there were statistically significant differences in all statements in favor of the alternative "Agree," where all values of (X^2) were significant at the indication level (0.01), with the exception of statement No.(4), in which the differences were in favor of the alternative "Disagree".

As for the arrangement of these expressions in relation to their relative importance, we note the following:

- The phrase (5), which is "The system provides the possibility of printing a paper copy of students' results and statistics for the two academic semesters," came in first place in the ranking of statements that indicate the accuracy of results and statistics of the electronic correction system to correct objective tests, as its relative importance reached (100%).
- The phrase (2), which is "The system calculates students' exam results quickly and with high accuracy," came in second in the ranking of statements that indicate the accuracy of results and statistics of the electronic correction system to correct objective tests, as its relative importance reached (98%).
- The phrase (1), which is "The system calculates students' exam statistics quickly and with high accuracy," came in third in the ranking of statements that indicate the accuracy of results and statistics of the electronic correction system to correct objective tests, as its relative importance reached (94%).
- The phrase (3), which is "The system displays a comprehensive electronic report on students' results that includes all the required data such as academic year, semester, division, level, etc.," came in fourth in the ranking of statements that indicate the accuracy of results and statistics of the electronic correction system to correct objective tests, as its relative

importance reached (88.7%).

- The phrase (4), which is "The system displays a comprehensive electronic report on statistics of students' results that includes all the required data such as academic year, semester, division, level, question number, etc.," came in fifth in the ranking of statements that indicate the accuracy of results and statistics of the electronic correction system to correct objective tests, as its relative importance reached (50%).

To discuss the results of the first hypothesis with regard to the fourth dimension of the proposed scale, "The accuracy of results and statistics of the Mansoura University E-Correction System to correct objective tests," it becomes clear that the first hypothesis was achieved, as there were differences in the frequencies of faculty members' responses to the items of the proposed satisfaction scale with respect to the real procedures of implementing the electronic correction system for objective tests at Mansoura University in favor of the alternative "Agree". This means that the faculty members are satisfied with the precision of results and statistics of the electronic correction system due to its good design by skilled software developers at the university's technology center.

▪ Results of the Second Hypothesis

The second hypothesis states that "There are statistically significant differences between the average scores of faculty members satisfaction with the real procedures of implementing the electronic correction system for objective tests at Mansoura University due to the member's gender (males/females)".

To verify the truthfulness of the second hypothesis, the (T) test for independent samples was used to detect the statistical significance of the differences between the average scores of male and female faculty

members on the proposed satisfaction scale regarding the real procedures of implementing the Mansoura University E-Correction System for objective tests at Mansoura University. The outcomes of the T-Test to verify the second hypothesis are shown in Table 9.

Table 9: The results of the (T) test to verify the second hypothesis (n = 50)

Dimension	Gender	No	Average	Standard Deviation	" T " Value	Degree of Freedom	Indication Level
Readiness of Mansoura University's E-Correction Environment to Correct Objective Tests	Male	25	2.168	0.307	0.803		0.426
	Female	25	2.071	0.519			Not Significant
Quality of Graphical User Interface of Mansoura University's E-Correction System to Correct Objective Tests	Male	25	2.645	0.329	1.628		0.110
	Female	25	2.457	0.476			Not Significant
The Ability of Mansoura University's E-Correction System to Correct Objective Tests	Male	25	2.401	0.331	1.804	48	0.077
	Female	25	2.090	0.795			Not Significant
Accuracy of Results and Statistics of Mansoura University's E-Correction System to Correct Objective Tests	Male	25	3.315	0.635	1.067		0.291
	Female	25	2.536	0.325			Not Significant
The Overall Score of the Scale	Male	25	2.632	0.899	1.675		0.100
	Female	25	2.289	0.495			Not Significant

It is clear from the results of the previous table that the all values of (T) were not statistically significant, which means that there are no statistically significant differences between the average scores of faculty members due to the gender of the members (males/females) in all dimensions and the total score of the proposed satisfaction scale regarding the real procedures

of implementing the Mansoura University E-Correction System to correct objective tests.

To discuss the results of the second hypothesis, it becomes clear that the second hypothesis was not achieved. The justification for this is that the faculty members at Mansoura University, whether male or female, receive the same training courses and workshops related to measurement and evaluation, and most of them also have the same passion for attending scientific seminars and conferences because it is one of the requirements for promotion, which provides them with sufficient experience and knowledge to evaluate the electronic correction procedures for objective tests at Mansoura University.

▪ Results of the Third Hypothesis

The third hypothesis states that "There are statistically significant differences between the average scores of faculty members satisfaction with the real procedures of implementing the electronic correction system for objective tests at Mansoura University due to the nature of the faculty (practical/theoretical)".

To verify the truthfulness of the third hypothesis, the (T) test for independent samples was used to detect the statistical significance of the differences between the average scores of faculty members in practical faculties and theoretical faculties in their satisfaction with the reality of the procedures for implementing the Mansoura University E-Correction System for objective tests at Mansoura University. The outcomes of the T-Test to verify the third hypothesis are shown in Table 10.

Table 10: The results of the (T) test to verify the third hypothesis (n = 50)

Dimension	Gender	No	Average	Standard Deviation	" T " Value	Degree of Freedom	Indication Level
Readiness of Mansoura University's E-Correction Environment to Correct Objective Tests	Male	25	2.168	0.307	0.803		0.426
	Female	25	2.071	0.519			Not Significant
Quality of Graphical User Interface of Mansoura University's E-Correction System to Correct Objective Tests	Male	25	2.645	0.329	1.628		0.110
	Female	25	2.457	0.476			Not Significant
The Ability of Mansoura University's E-Correction System to Correct Objective Tests	Male	25	2.401	0.331	1.804	48	0.077
	Female	25	2.090	0.795			Not Significant
Accuracy of Results and Statistics of Mansoura University's E-Correction System to Correct Objective Tests	Male	25	3.315	0.635	1.067		0.291
	Female	25	2.536	0.325			Not Significant
The Overall Score of the Scale	Male	25	2.632	0.899	1.675		0.100
	Female	25	2.289	0.495			Not Significant

It is clear from the results of the previous table that the all values of (T) were not statistically significant, which means that there are no statistically significant differences between the average scores of faculty members due to the faculty's nature in all dimensions and the total score of the proposed satisfaction scale regarding the real procedures of implementing the Mansoura University E-Correction System to correct objective tests.

To discuss the results of the third hypothesis, it becomes clear that the third hypothesis was not achieved. The justification for this is that the center of measurement and evaluation at Mansoura University contributed to

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spreading the culture of measurement and evaluation through periodic equal visits to practical and theoretical faculties and qualifying their faculty members in building good achievement tests regardless of the nature of the course content.

Ultimately, the results of arranging the dimensions of the proposed scale to measure faculty members' satisfaction according to the average are shown Table 11.

Table 11: The final results of the faculty members' satisfaction based on the average score

Dimension	Average	Standard Deviation	Ranking	Satisfaction Level
Readiness of E-Correction Environment	2.08	0.363	4	Moderate
Quality of E-Correction System Graphical User Interface	2.53	0.361	2	High
Accuracy of E-Correction System to Correct Objective Tests	2.15	0.561	3	Moderate
Methods of E-Correction System to Display Results of Objective Tests Correction	2.58	0.255	1	High
The Overall Average	2.34	0.367	–	High

Finally, even though the paucity of research in this scientific area, either Egyptian or Arab, we have found certain studies that support the findings of the current study, such study conducted by (Musa.F.A.A., Kashef.E.A.A and Doha.I.S.M, 2020) at the local level, which aimed to determine the opinions of instructors and students at Damanhur University's Faculty of Education on electronic assessments and automatic grading both before and after they were exposed to them (their application) and suggested faculty members be trained to deal with electronic correction models and create electronic exams, as well as reviewing the experiences of Arab and Foreign countries in the field of automated correction and electronic testing. On the other hand, at the Arab level, these results agreed with the results of study

conducted by (Al-Harbi, E.J.H, 2022), which aimed to assess E-Exam from the perspective of faculty members at Kingdom Saudi Arabian universities and suggested the establishment of committees to supervise and evaluate E-Exams at the Saudi University level, the development of capacity-building initiatives to improve faculty members' proficiency with electronic testing, the setup of university infrastructure to administer electronic exams in classrooms, and conduct additional research on electronic exams and their development mechanisms.

In conclusion, the authors' viewpoint indicates that there is a scarcity of research and studies on the evaluation of exam correction systems for objective tests, both in Egypt and Arab world. As a result, this study is regarded as a minor contribution and a guide for researchers at various universities in Egypt and Arab world to evaluate the objective examination correction systems in their universities.

12. Study Recommendations

The following recommendations must be taken into consideration in order to promote the concept of development and the use of technology and keep up with the digital transformation. These recommendations are based on the already mentioned theoretical framework and prior research, as well as the findings of this study. It is hoped that these recommendations will help activate and develop automated correction objective test systems and make the optimal use of them to ensure the continuous development of the educational process.

- It is necessary to add essay questions that require long written answers in addition to the objective questions to ensure that students do not rely on quickly cheating on the answers of their peers in the exam committees.
- The need to create computerized tests that adhere to international

standards and take into account the principles of measurement and evaluation that are based on reliable scientific principles. This will guarantee that graduates have a high level of expertise. As a result, Egyptian institutions will be on par with those throughout the world and the higher education system will become reputable and certified. Additionally, it will give Egyptian students more motivation to finish their degree domestically rather than thinking about studying overseas.

- In order to stay up with the latest technical advancements, E-Learning must be activated, which necessitates using computers that are capable of performing electronic assessments. Compared to the Semi-Electronic correction approach that uses exam forms that students fill out with pens to shade in circles, this might be more adaptable in terms of digitizing tests and correcting.
- Offering universities and other higher education institutions access to E-Learning and E-Testing. This assessment technology guarantees fair grading while saving time and effort. The goal of this is to make education digital.
- Developing an automated exam correction system to address the challenges and obstacles faced by students and faculty members when using this system, and working to overcome them.
- It is essential to benefit from the experiences of international and local universities that adopt E-Learning, electronic testing, and electronic correction, particularly international universities, to transfer their expertise to Egypt with all its mechanisms.
- The necessity to supply technological infrastructure and facilities to enable the execution of electronic tests, such as dedicated centers for electronic assessments. This will motivate faculty members to carry out electronic tests with simplicity and comfort.

- It is essential to promote the culture of E-Learning and E-Testing among faculty and university members. Additionally, it is important to connect the idea of E-Assessment with the teaching techniques of courses and curricula. The course and curriculum creation should be done electronically, and staff members should be motivated and offered extra incentives for those who adopt this system.
- Adopting a change management strategy for the complete digital learning transformation process, emphasizing the digital generation as leaders of change when integrating the E-Learning and E-Testing system.
- There is a need to create quality control and accountability initiatives, which means we need to act swiftly to formulate programs that assess the graduates of academic programs, making certain that their qualifications correspond with the demands and criteria of the job market.
- Educational institutions should implement benchmark assessments, instead of merely contrasting students with their contemporaries, to reach excellence.
- It is essential to implement item response theory models when creating tests and analyzing their data, to ensure suitable assessments for students that exhibit strong and relevant psychometric characteristics. This will result in the creation of a question bank with suitable statistical qualities for every level of students.
- Raising awareness among faculty members and students regarding the advantages of electronic assessment, including its time-saving and effort-saving benefits over conventional assessment methods, as well as its widespread use in developed countries. This will allow them to acquire global experience and knowledge and compete with their counterparts from around the globe.

13. Conclusion and Future Work

▪ Conclusion

With the development of science and technology in the current era, the faculty member has become required to keep pace with modern trends, especially in the assessment process, in order to be able to apply modern perspectives in the process of evaluating university students.

To be sure, the electronic correction system for university tests is one of the most important digital transformation tools, and its success largely depends on how much academic faculty members agree with its practical applications and how useful it is.

This research paper aimed to identify the views of faculty members on the procedures followed in the Mansoura University electronic correction system, identify the degree of difference in satisfaction levels due to gender (males vs. females), and also identify the degree of difference in satisfaction levels due to the nature of study at the faculty (practical vs. theoretical).

The analysis of the results obtained showed that, the first hypothesis was achieved, while the second and third hypotheses were not achieved.

The research recommends the necessity of generalizing the electronic correction system for tests in all Universities and preparing in the future to fully automate the education and evaluation process, in order to keep pace with modern technological developments and digital transformation in all areas of life.

▪ Future Work

Future efforts aim to develop a web-based system powered by more AI services for correcting objective and essay tests.

❖ Author Contribution

The author participated in the study design, data collection, statistical analysis, and data interpretation. In addition, he wrote the manuscript, performed changes requested by reviewers, and then prepared the final version for publication.

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The author was not provided with any financial support to conduct this research.

❖ Ethics Declaration

The scientific ethics committee of the Faculty of Specific Education, Mansoura University, Egypt, provided institutional approval to perform this research.

❖ Declaration of Interest

The author has not revealed any conflict of interest with others.

❖ Data Availability

The author declares that the data generated or analyzed during this study are available upon request.

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