

## Research Article

# Developing a Model for a Distance Learning Environment to Confront Crises and Disasters

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## Abstract

The current era is characterized by many accelerating events that directly affect education, most of which have a negative impact. Natural disasters, epidemics, wars, and other events are among these events. In recent years, the world has witnessed the COVID-19 pandemic, which has made it clear beyond doubt that institutions' educational systems were not prepared with alternative educational systems to confront such disasters, and thus, education was greatly affected, the effects of which are still present today. Therefore, it is necessary to prepare for such events by designing and developing electronic learning environments through which learning can be transferred safely and effectively. Such environments are comprehensive and self-sufficient to transfer learning in its three aspects: cognitive, skill, and psychological aspects of the learner. Considering this, the current research was interested in designing a model for an e-learning environment for distance learning that provides everything the learners may need. It includes scientific and health knowledge, mental and physical exercise, and educational platforms for interaction. This is considering a survey study of students at Ain Shams University, one of the largest universities in Egypt, in several faculties to determine the extent of the shortcomings in the electronic platforms used during and after the COVID-19 pandemic as an example of one of the most dangerous disasters that the world has witnessed in contemporary times, which directly affected education in all educational institutions. The results revealed a clear need for improvement in these platforms regarding general design, communication tools, strategies, educational activities, and feedback. Hence, there is an inevitable need to develop a model for an e-learning environment for distance education that can be used effectively to transfer learning, especially in crises, disasters, and epidemics.

## Keywords

Distance Learning Environment, Crises, Disasters

## 1. Introduction

Since the World Health Organization declared in March 2020 that the COVID-19 virus represents a global pandemic, the world has faced challenges in various fields of life, in-

cluding economic, political, social, and educational systems. In the educational field, especially in higher education institutions, the impact of the pandemic is equally dangerous [41],

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as 91% of higher education institutions have replaced live or face-to-face teaching with remote activities [31]. Thus, the shift from the traditional educational system to reliance on e-learning and distance education and support for the use of information and communication technology (ICT) and this sudden change was a challenge for both students and teachers to adapt quickly and move from interaction within the classroom face-to-face to interaction through the classroom via the Internet and remotely [22].

Higher education institutions faced several challenges to achieve this digital transformation in the educational process, including those related to the available capabilities, resources, and infrastructure, the quality of performance, and the level of competence and proficiency [30, 26], and the trends and level of satisfaction of students and teachers. For example, most of the students and teachers suffered from not receiving appropriate training on how to use online learning systems, in addition to suffering from a lack of information and communication technology infrastructure and poor access to the Internet, especially in many rural and remote areas, and poor availability of digital learning tools and resources, such as e-books and electronic diaries, which had a significant impact on student's motivation and effectiveness during learning, and thus, its impact on the quality of the teaching and learning processes [19, 30].

Given the institutions of higher education in Egypt, of which there are 24 public universities, the entire educational process continued via the Internet with the spread of the pandemic in mid-March 2020. Universities differed in how to employ the Internet in the educational process, for example, educational platforms such as A model platform, university websites, and free communication platforms such as Google Virtual Classrooms, the ZOOM platform, and Microsoft Teams, in addition to social media tools such as WhatsApp, Facebook, and YouTube channels. These have been predominantly employed in the educational process due to their spread among students and teachers for their ease of use and because they do not require the simultaneous presence of both [34, 39].

### 1.1. The Problem of the Research

Many studies have been conducted to examine the impact of the COVID-19 pandemic on higher education in several developed foreign countries, including the United States of America and Europe [27, 43], as well as in several Arab countries such as Jordan, Saudi Arabia, and Egypt. These studies have shown that Arab countries, despite their different economic, social, and cultural levels and technological infrastructure, have paid increasing attention to online learning and that it is still in its early stages compared to foreign countries [3, 25], and other studies were conducted to analyze the impacts of the COVID -19 pandemic in educational institutions, particularly the challenges and opportunities created by this emergency [2, 18] and assessing the experience of distance

education in emergencies and crises with the aim of good planning for its future application [24].

The goal of the current research is to describe the mechanisms and tools that were used during the COVID-19 pandemic. The researchers diagnosed undergraduate students' and faculty members' views of the reality of learning environments, e-learning platforms, and learning management systems (LMS) during the COVID-19 pandemic. Then, an e-learning model was developed to prepare for future disruptions and increase the effectiveness of information and communication technology tools in the educational process.

Therefore, the research sought to answer the following central question:

"How can a model of an e-learning environment be designed for distance education to confront crises, disasters, and epidemics in the light of a survey study at Ain Shams University?"

This central question is divided into the following questions:

What platforms are most used during and after the COVID-19 pandemic, and which are the most preferred from the student's point of view?

What is the effectiveness of the e-learning platforms for distance education used during and after the COVID-19 pandemic from the student's point of view regarding communication tools, strategies, educational activities, feedback, support, and evaluation tools?

What platforms are most used during and after the COVID-19 pandemic, and which are the most preferred by faculty members at Ain Shams University?

What is the effectiveness of the e-learning platforms for distance education used during and after the COVID-19 pandemic from the point of view of faculty members in terms of communication tools, strategies, educational activities, feedback, support, and evaluation tools?

What is the design of the proposed e-learning model for distance learning to confront crises and disasters?

### 1.2. Research Aims

The research aims to:

First: Study the current situation of distance e-learning and the platforms used to transmit it at Ain Shams University from the point of view of both university students and faculty members.

Second: Present a proposed design for an e-learning model for distance education to confront crises, disasters, and epidemics.

### 1.3. The Significance of the Research

This research is significant because:

It provides the responsible authorities with research results to develop distance learning and e-learning platforms.

It is vibrant in many distance learning examples that could

be an excellent reference for future researchers.

## 2. Review of Related Literature

### 2.1. Distance e-Learning in the Context of Crises

Over the past decade, the term "Education in Emergencies" has emerged as a fundamental and legitimate solution as a response to the continuation of schoolwork in times of humanitarian crises such as wars, epidemics, and environmental disturbances [5, 17, 42]. Schoolwork and school attendance are affected in times of crisis; this necessitates using alternative learning systems such as accelerated learning programs, community education, and temporary learning spaces. Studies have shown that providing students with structured, meaningful, and creative activities in a school environment or informal learning spaces improves their behavior and motivation [15, 4]. E-learning and distance education are some of the alternative learning systems to traditional education, which have been widely employed in many countries to facilitate the educational process during the spread of the COVID-19 pandemic.

E-learning was defined as "an educational system for providing educational/training programs to students/trainers at any time and anywhere using information technology and interactive communications such as (the Internet, television channels, e-mail, computers, teleconferencing...) in a synchronous or non-synchronous manner [44], and the American Association for Distance Learning defines it as "the process of acquiring knowledge and skills through a variety of mediums for the transmission of education and information, including all types of technology and different forms of the level of education for distance learning" [13]. Hence, it is an interactive system for education that is provided to the learner using information and communication technology and relies on an integrated digital electronic environment that presents courses through electronic networks, providing guidance and direction, organizing tests, and managing and evaluating resources and processes.

However, several studies indicated the poor preparation of higher education institutions for it and the absence of appropriate planning, design, and development of online educational programs due to the COVID-19 pandemic [2], which becomes evident when the difference between the usual daily use of e-learning via the Internet and what we do in a hurry in times of crisis with the minimum possible resources and time becomes clear [24, 32].

E-learning is based on several principles, the most important of which are considering the characteristics of the learners, the availability of a great deal of freedom in learning situations by preparing multiple positions that allow learning to be chosen according to its capabilities, and the individual differences among learners by presenting information in a variety of forms that suit the abilities of the learners in terms of presenting it in written or audio verbal form, or presenting

it in fixed or animated pictures and drawings, focusing on the learner [20].

### 2.2. The Reality of Distance E-Learning During the COVID-19 Pandemic

The COVID-19 pandemic caused a global crisis of an unprecedented nature and affected all pillars of modern society, including the economy, health systems, human interactions, and education. In the case of education, technology was the leader, as universities were closed for several months, and many universities were able to provide educational services to students via the Internet only due to the level of global communication and the development of educational technology, and the use of different methods of academic delivery.

It took much work to develop complete models for distance education quickly. However, the state of emergency imposed by the pandemic allowed universities to draw inspiration from many practices developed from distance education initiatives. The application of distance e-learning during the COVID-19 pandemic faced many challenges [1, 38] for students: It was evident in the lack of technological awareness and complete perception, lack of adequate training in computer and Internet use techniques, anxiety over misuse of the Internet, constant fear of accessing unapproved or non-educational sites, technical problems such as internet outages or sudden power outages, and lack of direct communication with the teacher. Besides, the small number of computers compared to the number of students who use the Internet in education.

For the faculty members: the most important of them was how to manage the classroom and the process of continuous evaluation by designing appropriate activities and assignments, specialization, and experience to develop a personal learning environment, lack of adequate training, and lack of technical support, and the lack of required diversity in the sources that achieve the appropriate interaction for students.

There are many studies conducted at the local and global levels, which confirmed the existence of some challenges facing remote e-learning, whether before or during the COVID-19 pandemic [1, 8, 10, 12, 14, 23, 28, 36] that indicated there are many obstacles to e-learning for higher education institutions, including lack of infrastructure, unwillingness to replace the old with new educational methods, weak student acceptance of new technology in education, difficulty in overcoming material costs, weak ability to adapt to new teaching methods, lack of electronic teaching strategies, fear of faculty members in minimizing their role in the educational process, the role shifts to the designers of educational software, the competence of education technology, the difficulty of applying evaluation tools and means. In addition to the community members' view of e-learning as having a lower status than regular education and the scarcity of educational materials suitable for e-learning in the Arabic language, the presence of many technical problems that occur when

communication is interrupted when presenting the curriculum through the information network, and the constant need to develop and renew the used applications and software.

On the other side, Sun, Chen [40] reviewed 47 published studies on online teaching and learning since 2008 and concluded that effective online teaching depends on several factors: good design of educational content, active interaction between the teacher and the learners, well-trained and fully technically supported teachers, creating a trend towards online education, the rapid advancement of technology, and accordingly, the researchers made practical suggestions for those who plan to develop online courses.

The study by Mohammed and Nasser [33] aimed to study the efforts of some Arab and foreign universities (King Abdul-Aziz University in Saudi Arabia, Emirates University, Harvard University in the United States of America, Cambridge University in England, and the University of Sydney in Australia) in facing the crisis caused by the emerging coronavirus and the possibility of benefits from it in Egyptian universities, through browsing the official websites of these universities on the Internet, as well as their official webs on social media, to learn about the reality of the crisis in these universities in the fields of administration, teaching, scientific research and community service, the study indicated that the following:

1. for the Arab universities: Implementing standardized formal e-learning platforms such as Blackboard synchronous and asynchronous format at the undergraduate and postgraduate levels, Psychological and counseling services for students during the crisis, and activating students' activities and competitions through their formal boards and social networking sites, The scope of programs to rely on research in the area of crisis response and the rewards of the best research have been dedicated to the advantage of parallel research, and research partnerships with medical and research institution to develop an HIV vaccine.
2. for the foreign universities: Concerned about making the COVID-19 crisis living summary of the curriculum and teaching it to students according to promising areas of study such as history and biology and Providing distance training courses to parents to teach them skills to support children's homeschooling.

El-Sayad et al. [22] examine the influence of academic self-efficacy, perceived usefulness of online learning systems, and teaching presence on student engagement (behavioral, emotional, and cognitive engagement) and student satisfaction with online learning. Data were collected from undergraduate students who experienced a fully online learning process during the COVID - 19 pandemic. Based on social cognitive theory, the relationships among the personal and environmental influences on student behavior and outcomes were examined using structural equation modeling. The results indicated that academic self-efficacy had significant direct relationships with behavioural and emotional engage-

ment, while perceived usefulness significantly influenced emotional and cognitive engagement. Furthermore, teaching presence significantly influenced all Engagement dimensions. Student satisfaction was significantly and directly influenced by behavioral and emotional engagement but not cognitive engagement. Finally, the mediation role of each engagement dimension is proven in this study. This study was conducted in Egypt; thus, it adds empirical evidence regarding online student engagement and satisfaction in a developing country.

On the other side, there are studies [6-7, 9, 11, 16, 35] conducted which confirmed the efficacy of distance E-learning in the time of COVID-19 on many learning outcomes while some studies have also sought to study the requirements for the success of educational platforms [37, 29, 21] as developing self-learning skills, a teacher who is good with computers and various accessories and internet applications, providing high- speed internet service, putting synchronous lessons into the systems for students to retrieve at any time.

### 3. Participants

The research's participants consisted of (2000) students from Ain Shams University, which included: (500) students from the Faculty of Women for Arts, Science and Education, Educational Division, (500) students from the Faculty of Women for Arts, Science and Education, Literary Division, (500) students from the Faculty of Women for Arts, Science and Education, Science Division (100) students from the Faculty of Agriculture, (100) students from the Faculty of Law, (100) students from the Faculty of Specific Education, (100) students from the Faculty of Pharmacy, (100) students from the Faculty of Medicine, In addition to (153) faculty members at Ain Shams University.

### 4. Method

The research followed the mixed method where preliminary data was used through a questionnaire about "evaluating E-learning platforms at Ain Shams University during and after COVID-19 "on students and faculty members at Ain Shams University. The second part was an analytical study to develop a model for an e-learning environment for distance education to confront disasters and crises like the COVID-19 pandemic.

### 5. Instruments

#### Quantitative instrument Questionnaire

The data was collected by designing two questionnaires to "evaluate learning platforms and e-learning at Ain Shams University," one for faculty members and the other for students. After reviewing studies evaluating education and e-learning platforms during the COVID-19 pandemic. Each



questionnaire included two sections:

The first section Included three open questions: "What platforms were used in university education?" What are the most used platforms? "What are the most preferred platforms to use?"

The second section: It included "70" statements distributed as the following dimensions:

The first dimension is the general design of the e-learning and learning platform, and it includes "13" statements.

The second dimension is the communication tools available on the platform, including "8" statements.

The third dimension is the teaching and learning strategies used through the platform, and it includes "12" statements.

The fourth dimension is the educational activities and feedback, including "10" statements.

The fifth dimension is educational support, assistance, and control, including "20" statements.

The sixth dimension is measurement and evaluation tools on the platform, including "7" statements.

The response to the questionnaire items was formulated according to a three-point Likert scale: "a great degree - a medium degree - a weak degree," and weights were given to the responses as follows:

A significant degree is "three Marks," a medium degree is "two Marks," and a weak degree is "one Mark."

#### *Questionnaire Validity and Reliability*

##### *Piloting the questionnaire*

The questionnaire was applied to a sample of (200) students and (60) faculty members to determine the validity and reliability of the questionnaires. The results were as follows:

##### *Questionnaire Reliability:*

The reliability of the scale was calculated by:

Alpha-Cronbach coefficient: The alpha-Cronbach coefficient was calculated for the sixth dimension of the questionnaire and the total questionnaire; [Tables 1 & 2](#) show the results.

**Table 1.** *The reliability of the questionnaire and its dimensions.*

Dimensions of the questionnaire	Cronbach's Alpha	Judging the reliability
1 <sup>st</sup> dimension	0.776	Accepted
2 <sup>nd</sup> dimension	0.738	Accepted
3 <sup>rd</sup> dimension	0.891	High
4 <sup>th</sup> dimension	0.939	High
5 <sup>th</sup> dimension	0.981	High
6 <sup>th</sup> dimension	0.915	High
The questionnaire	0.956	High

It is clear from [Table 1.](#) that the reliability values of the questionnaire dimensions range between (0.738 and 0.981), which is high reliability, and the reliability of the questionnaire is (0.956), which is also high reliability, which indicates that the questionnaire is reliable.

**Table 2.** *The reliability of the questionnaire and its dimensions.*

Dimensions of the questionnaire	Cronbach's Alpha	Judging the reliability
1 <sup>st</sup> dimension	0.867	Accepted
2 <sup>nd</sup> dimension	0.854	Accepted
3 <sup>rd</sup> dimension	0.722	High
4 <sup>th</sup> dimension	0.844	High
5 <sup>th</sup> dimension	0.884	High
6 <sup>th</sup> dimension	0.829	High
The questionnaire	0.962	High

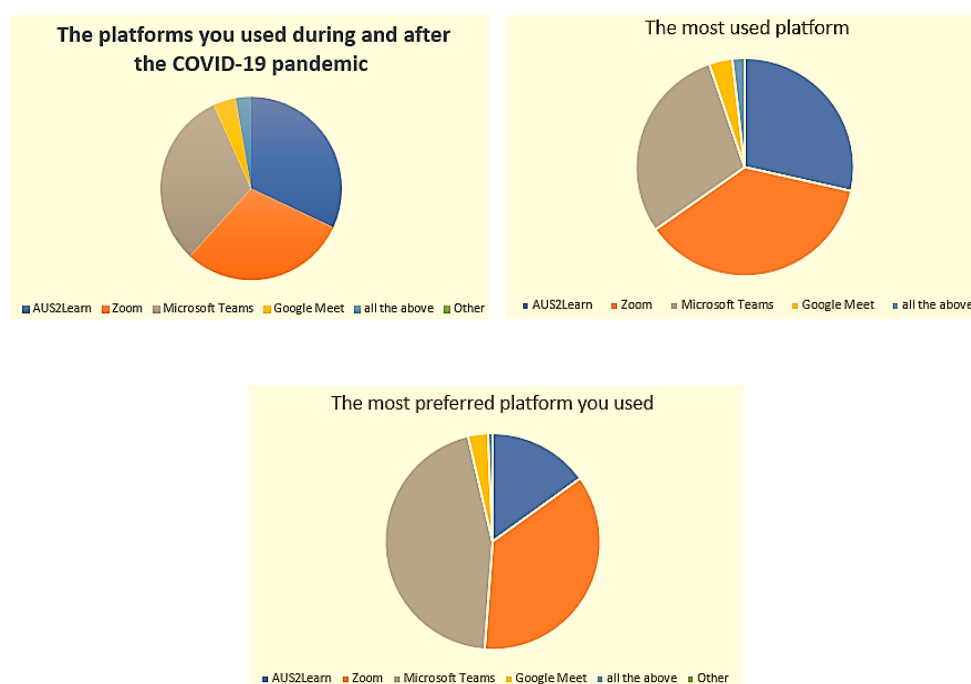
It is also clear from [Table 2.](#) that the reliability values of the questionnaire dimensions range between (0.722 and 0.884), which is high reliability, and the reliability of the questionnaire is (0.962), which is also high reliability, which indicates that the questionnaire is reliable.

## 6. Results and Discussion

The SPSS twenty-third version program was used to reach the search results, and the results are shown below.

To answer the first question, which states, "What platforms are most used during and after the COVID-19 pandemic, and which are the most preferred from the student's point of view? The results of the descriptive statistical analysis of the data were relied on, including means, standard deviations, frequencies, and percentages for all paragraphs of the questionnaire. It was considered that the three-point Likert scale used in the study was graded as follows: A great degree is "three grades," a medium degree is "two grades," and a weak degree is "one grade." Accordingly, the arithmetic means values that were obtained from the study are treated as follows:

First, the results of the analysis of the Ain Shams University students' questionnaire about the platforms and distance e-learning environments that were used during and after the COVID-19 pandemic:

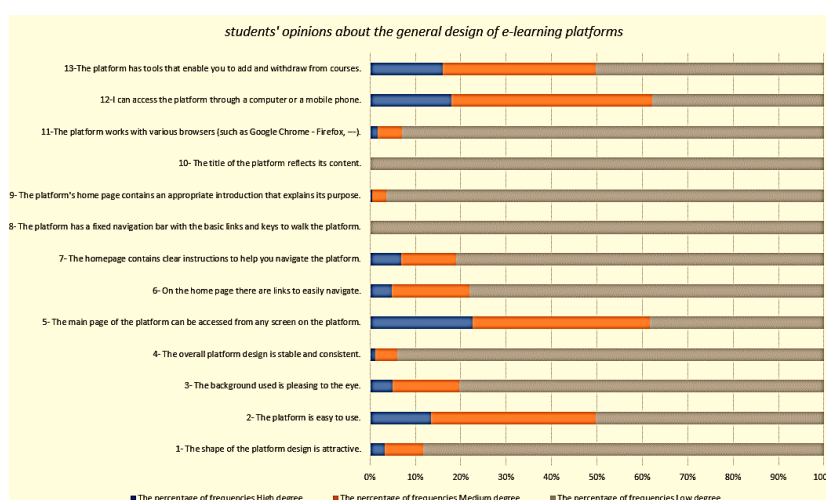


**Figure 1.** The results of the analysis of the first part of the questionnaire.

It is noted from Figure 1 that the platforms that were used during and after the COVID-19 pandemic are the Ain Shams platform, the Zoom platform, Microsoft Teams, and Google Meetings. The most used of them is the Microsoft Teams platform, then the Ain Shams platform, then the Zoom platform, and finally the Meeting platform, as it turns out. The most preferred platforms from the point of view of university students are the Microsoft Teams platform, the Zoom platform, the Ain Shams platform, and the Google Meeting

platform.

To answer the second question, "What is the effectiveness of the e-learning platforms for distance education used during and after the COVID-19 pandemic from the student's point of view regarding communication tools - strategies - educational activities, feedback, support, and evaluation tools?" Figure 2. shows the results of analyzing student responses about the general design of the e-learning and teaching platform used during and after the pandemic for distance education.



**Figure 2.** The results of student's opinions about the general design of e-learning platforms.

It is clear from Figure 2 that the most significant percentage of student opinions focused on the poor design of electronic platforms for distance education that were used during and after the COVID-19 pandemic; they are insufficient, and the available ones need to be used optimally.

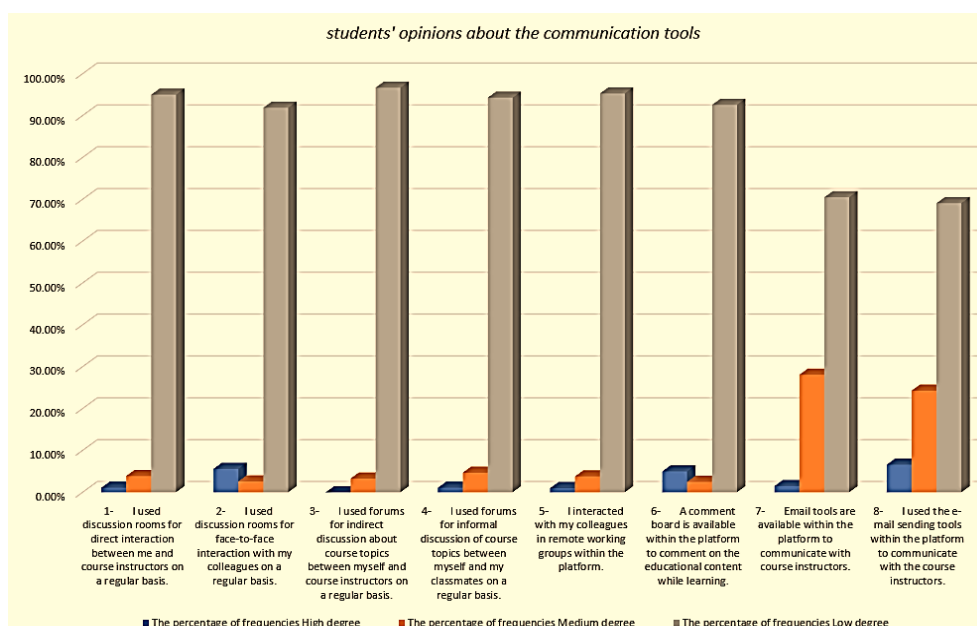


Figure 3. The results of students' opinions about communication tools.

Figure 3 shows that the communication tools available on the platforms need to be improved, and the available ones have not been used optimally.

Figure 4 shows the results of analyzing students' opinions about the teaching and learning strategies used during and after the pandemic through distance e-learning platforms.

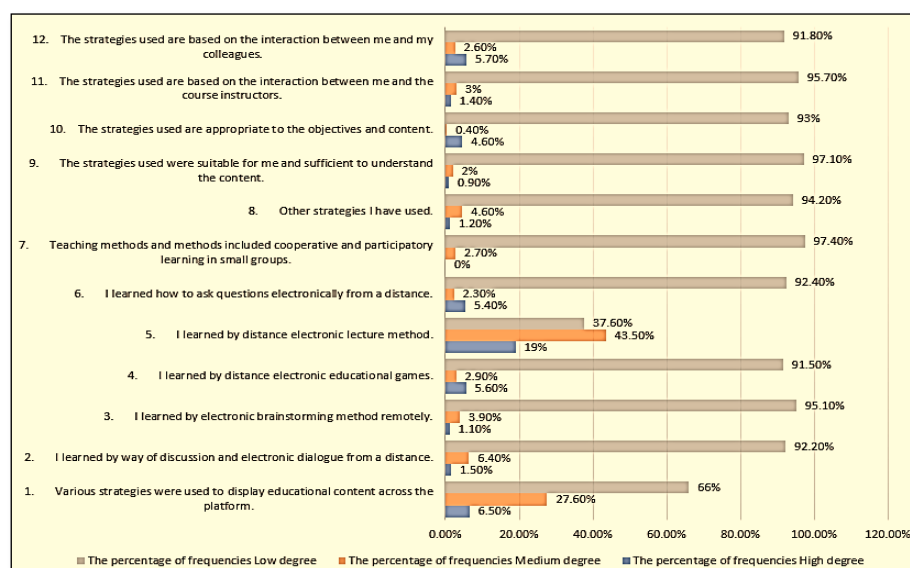


Figure 4. The results of students' opinions about the strategies.

Figure 4 shows that the essential strategies for distance education and e-learning were not used, and most of the methods of using the platforms were limited to uploading content files to students, which may be due to the lack of skills to use these strategies among both students and faculty members.

Figure 5 shows the results of analyzing students' opinions about the educational activities and feedback used during and after the pandemic through distance e-learning platforms.

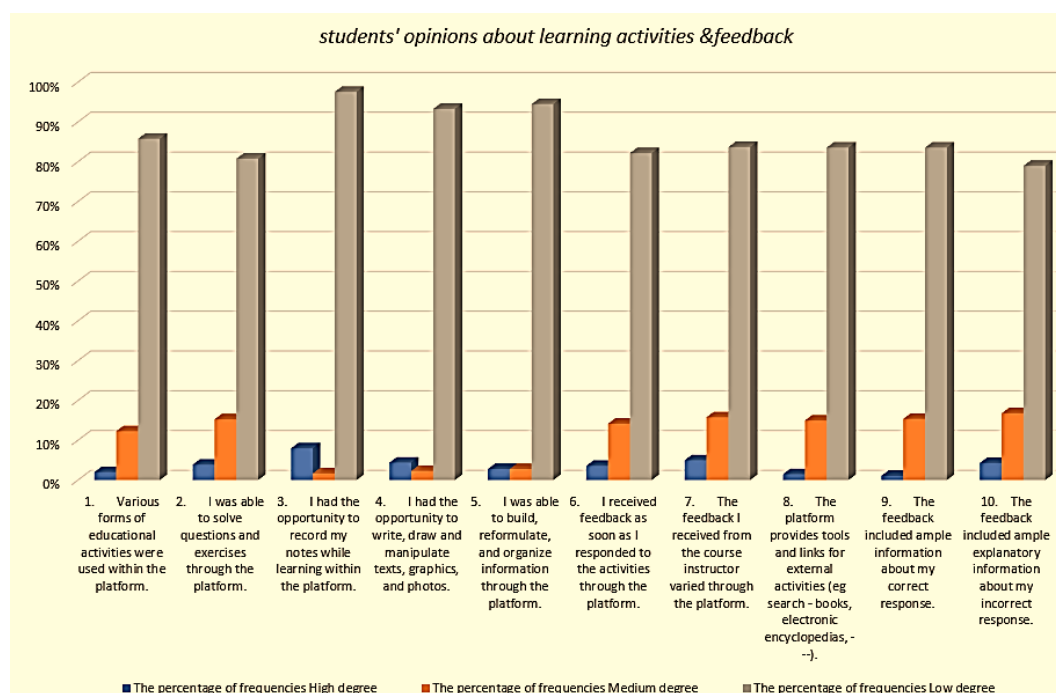


Figure 5. The results of students' opinions about learning activities and feedback.

Figure 5 shows deficiencies in the educational activities used and feedback needed to be used appropriately and in various forms.

Figure 6 shows the results of analyzing students' opinions about the forms of support and assistance and the degree of control used during and after the pandemic through distance e-learning platforms.

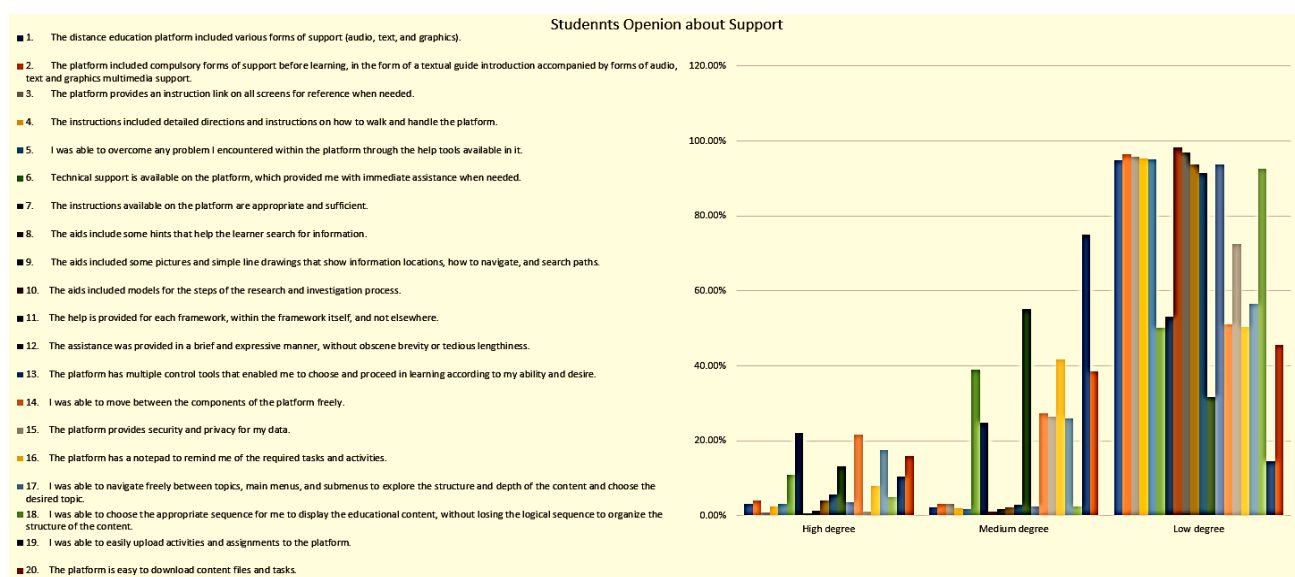


Figure 6. The results of students' opinions about support tools.

Figure 6 shows deficiencies in support, assistance, and the degree of control.



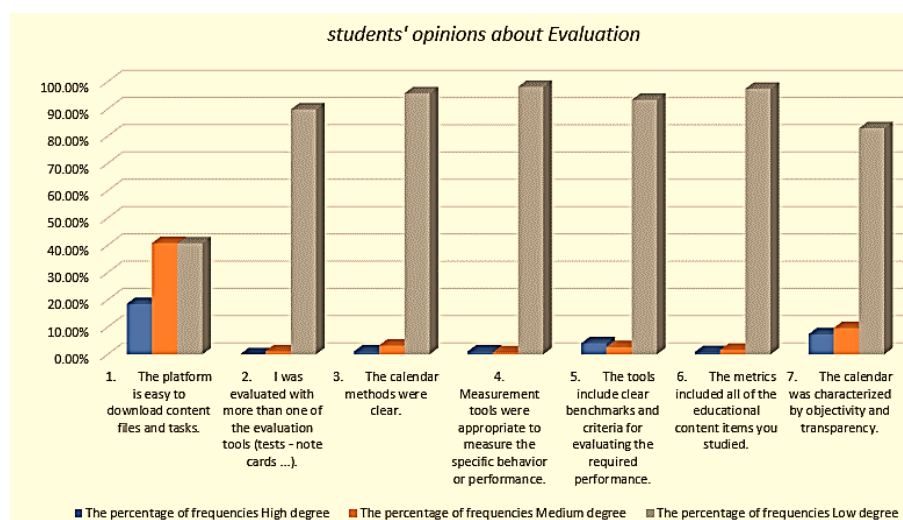


Figure 7. The results of students' opinions about the evaluation tools.

There are areas for improvement in the evaluation methods used, as shown in Figure 7.

It is clear from the previous presentation that there are multiple shortcomings from the point of view of students in the e-learning platforms and environments that were used during and after the COVID-19 pandemic, which requires the design, development, and production of an e-learning environment that includes the advantages of the existing platforms and overcomes their shortcomings. Sufficient and comprehensive so that it can be used in crises and pandemics that may occur in the future and be flexible so that it can be developed by adding, deleting, and amending whenever required.

Second, the results of the analysis of the Ain Shams Uni-

versity professors' questionnaire about the platforms and distance e-learning environments that were used during and after the COVID-19 pandemic:

To answer the third question, "What platforms are most used during and after the COVID-19 pandemic, and which are the most preferred by faculty members at Ain Shams University?"., The results of the descriptive statistical analysis of the data relied on including means, standard deviations, frequencies, and percentages for all paragraphs of the questionnaire. It was considered that the three-point Likert scale used in the study was graded as follows: A great degree is "three grades," a medium degree is "two grades," and a weak degree is "one grade." Accordingly, the arithmetic means values that were obtained from the study are treated as follows:

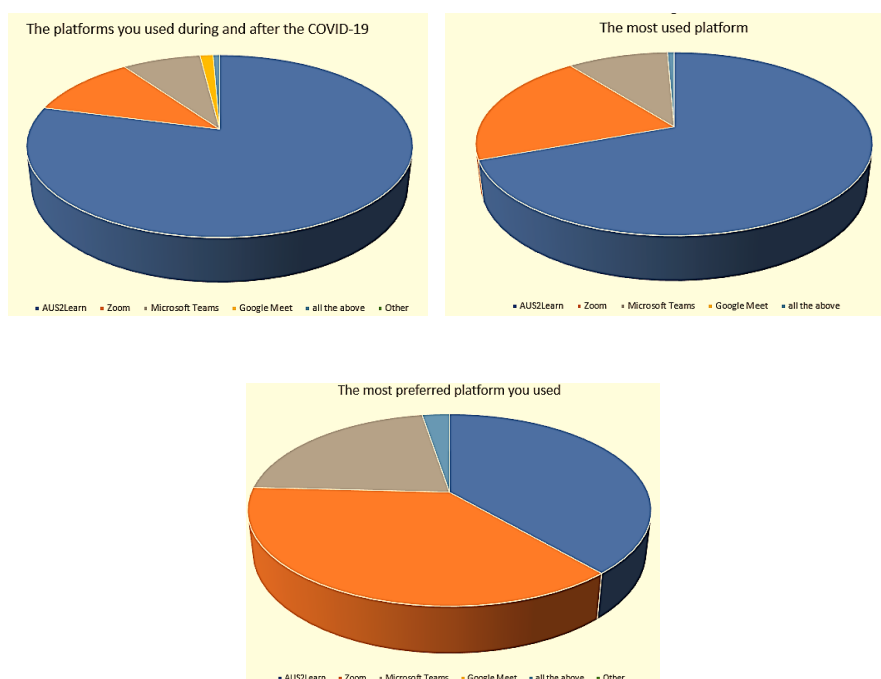
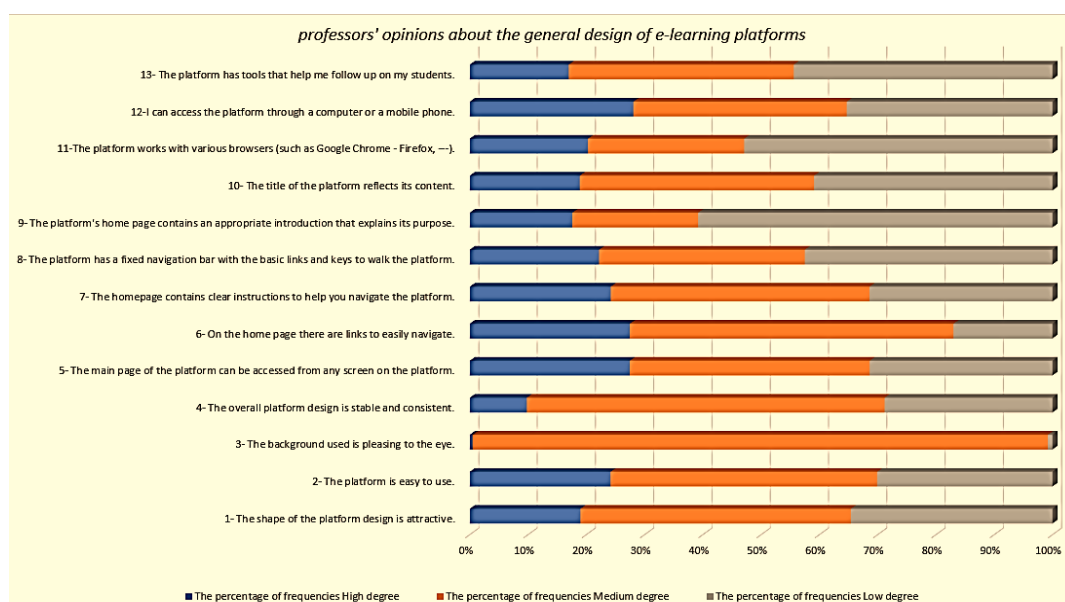


Figure 8. The results of professors' opinions about the general design of e-learning platforms.

It is clear from Figure 8 that there is a diversity of platforms used by faculty members during and after the COVID-19 pandemic, especially the Ain Shams, Teams, and Zoom platforms.

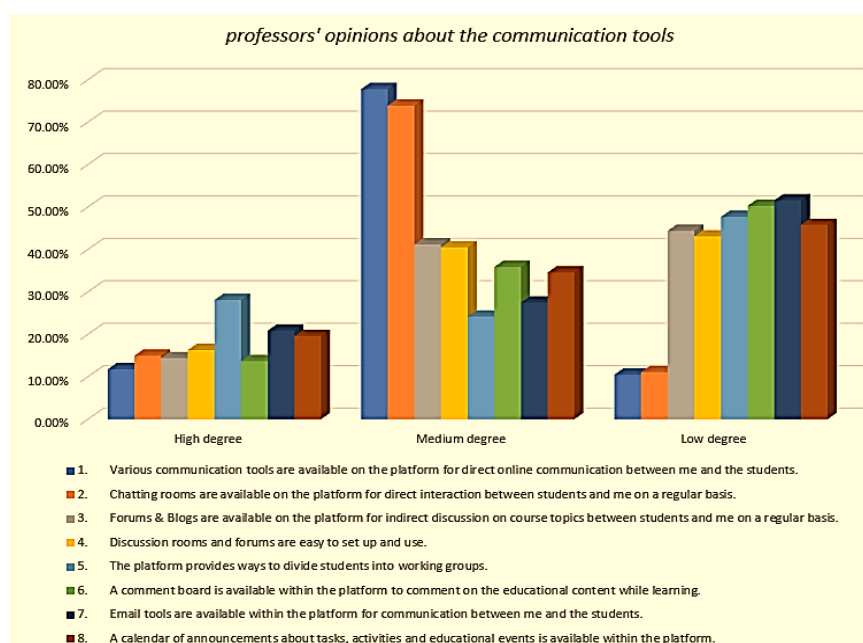
To answer the 4<sup>th</sup> question, "What is the effectiveness of the e-learning platforms for distance education used during and after the COVID-19 pandemic from the point of view of

faculty members in terms of communication tools - strategies - educational activities, feedback, support, and evaluation tools?" Figures 9 to 14 show the results of analyzing faculty members' responses about the general design of the E-learning and teaching platform used during and after the pandemic for distance education.



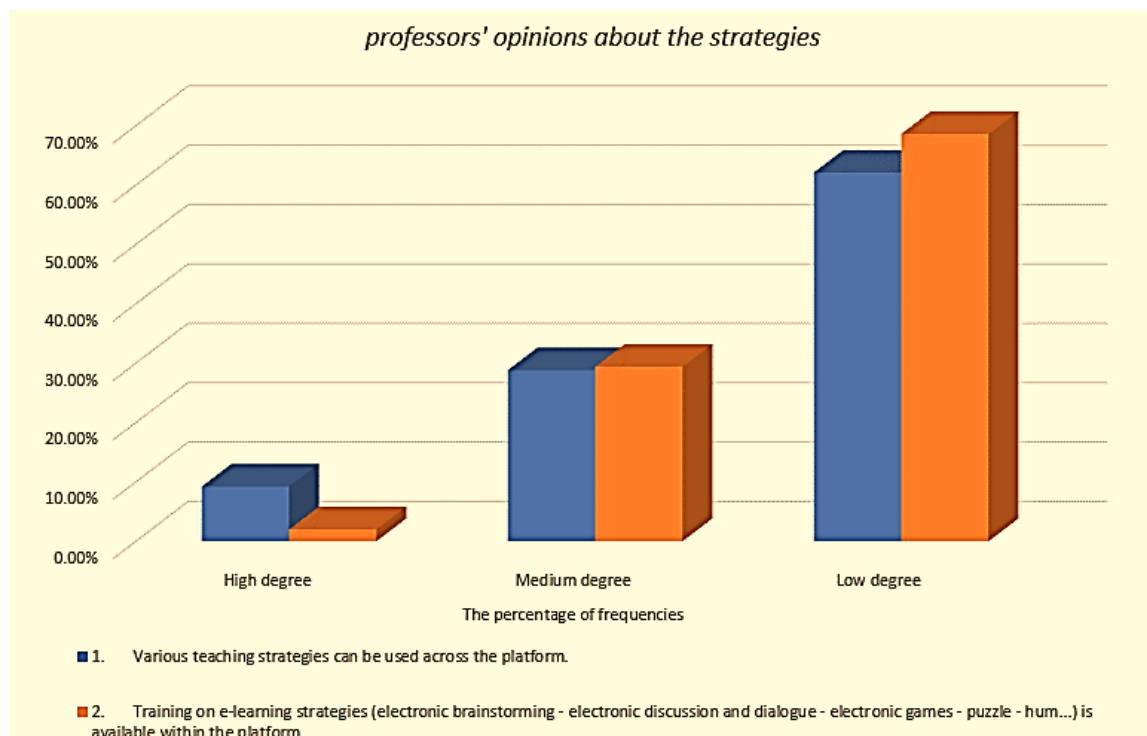
**Figure 9.** The results of professors' opinions about the general design of e-learning platforms.

It is clear from Figure 9 that opinions varied regarding the design of the platforms in terms of ease of use, attractiveness, and ease of access.



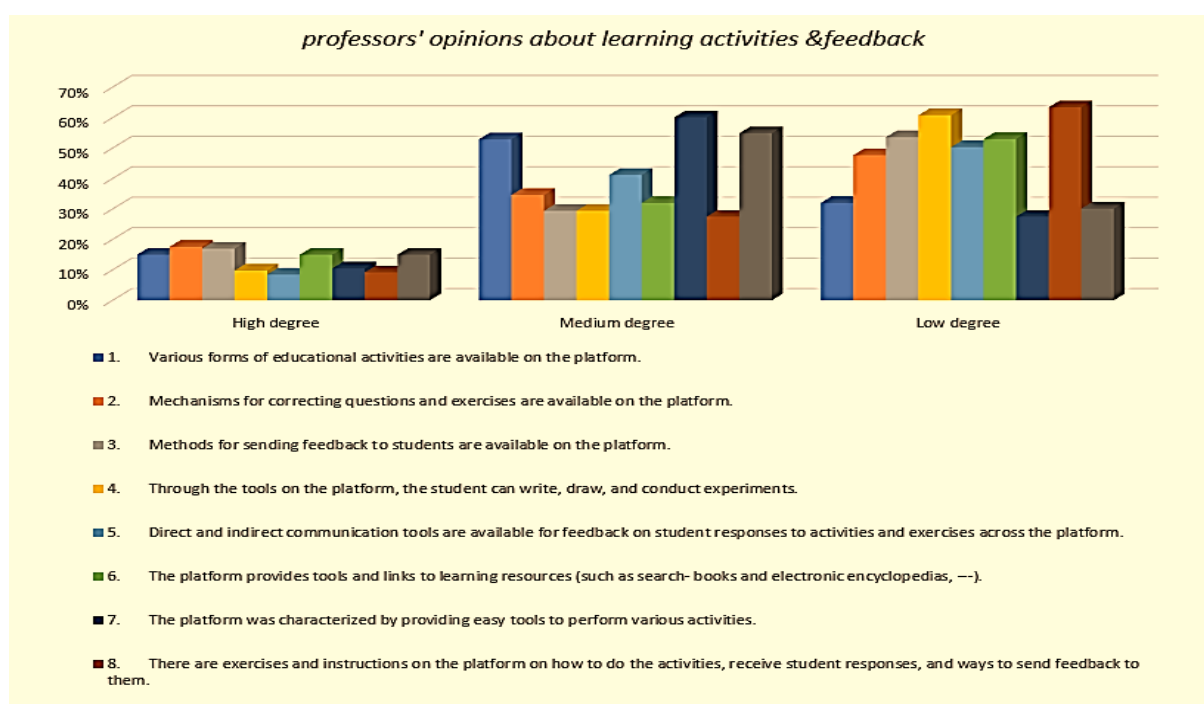
**Figure 10.** The results of professors' opinions about the communication tools.

Figure 10 shows that opinions fluctuate between dissatisfaction and moderate satisfaction with the availability of communication and communication tools between them and the students.



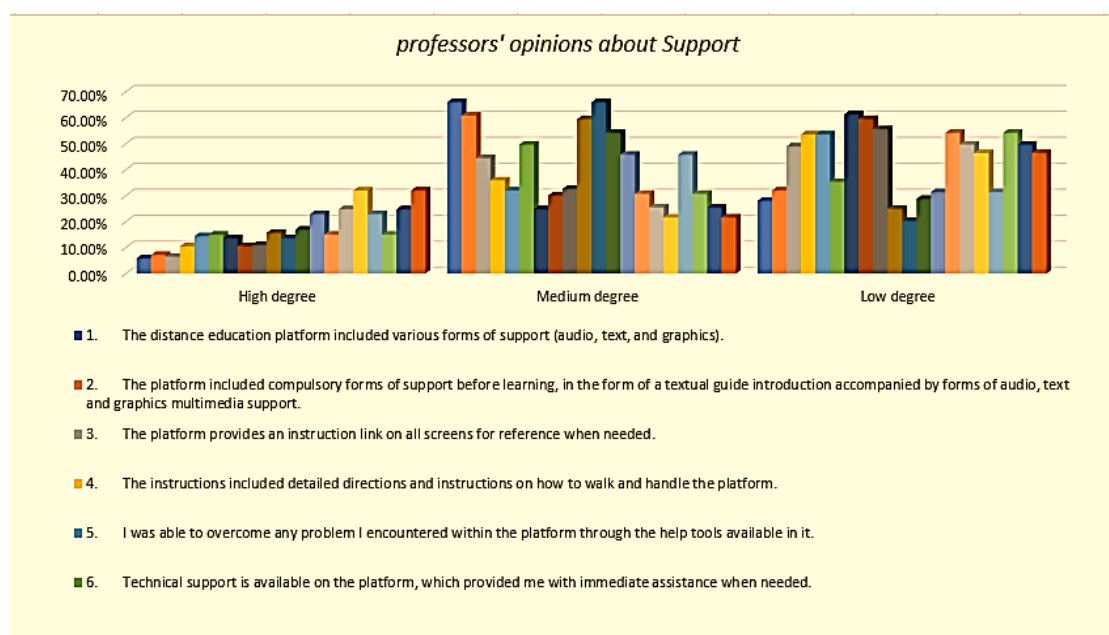
*Figure 11. The results of professors' opinions about the strategies.*

Figure 11 shows that members are dissatisfied with the availability of appropriate e-learning strategies for transferring and managing distance learning using current platforms.



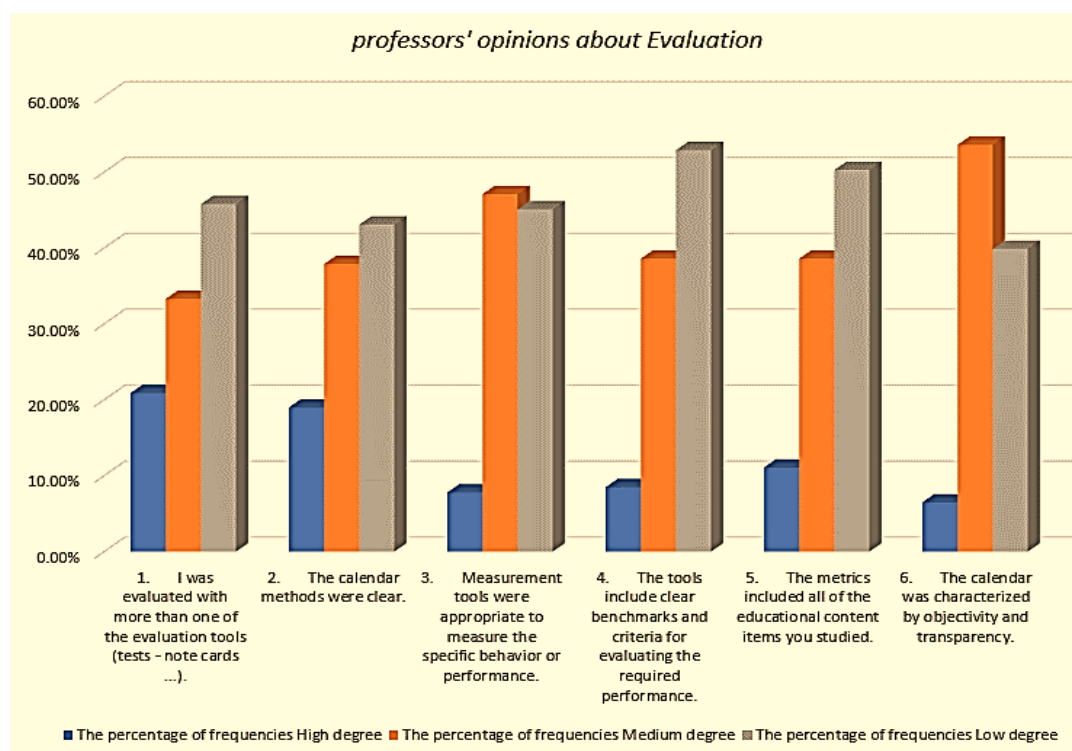
*Figure 12. The results of professors' opinions about learning activities feedback.*

It is clear from Figure 12 that members are dissatisfied with several items, which include the lack of precise mechanisms for sending activities and feedback, the lack of the necessary tools for that, as well as the lack of methods for training on distance e-learning skills and strategies to transfer learning.



*Figure 13. The results of professors' opinions about support tools.*

From Figure 13, members' opinions tend toward dissatisfaction with the support and activities provided by the current platforms.



*Figure 14. The results of professors' opinions about evaluation tools.*

By observing Figure 14, opinions fluctuate between moderate satisfaction and dissatisfaction with the evaluation methods available through current platforms.

From the results of a questionnaire measuring the opinions of students and faculty members at Ain Shams University about the platforms that were used during and after the COVID-19 pandemic, it turns out that there are shortcomings in these platforms, which makes them insufficient to transfer and manage learning during disasters and crises such as the COVID 19 pandemic, or other Disasters, wars, and crises that the world may be exposed to. Therefore, there is a need to develop a model for a virtual learning environment for distance learning to confront disasters, crises, and pandemics, which would be sufficient to transfer and manage learning from a distance. Therefore, the current research is interested in developing such a model, and the following is a presentation of the vision suggested for this model.

## 7. A Model for an e-Learning Environment for Distance Learning to Confront Crises and Disasters

To answer the question (5), “What is the design of the proposed e-learning model for distance learning to confront crises and disasters?” Considering the previous results of the questionnaires, the researcher<sup>1</sup> designed a model for an e-learning environment for distance learning to confront crises and disasters. This model has been created with a leading portal, which is divided into three portals, the first for students, the second for faculty members, and the third for university administrators, as follows:

First: Students Portal:

The form begins with the opening screen of the Virtual University for Distance Education. A robot appears to the student to help and guide the student with health guidelines for disease prevention, and he can take a virtual tour of the university. He can also see information about the university, its goals, and the digital library (Figure 15).

Then, the student enters the specific college to which he is affiliated, with the username and password, to show him\ her the main screen, which consists of courses according to the undergraduate level, study schedule, technical support, notepad, and course registration. Since it is a complete system for the learner, it was designed to be self-sufficient. There is a robot for voice and text assistance, as well as using multimedia when needed, such as showing videos and simulations. It also shows regular health instructions, including proper sitting methods, the appropriate time for continuous sitting on the electronic system, and healthy habits that must be followed in case of Epidemics and pandemics in a designated place on the screen.

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Figure 15. University main page (Dr. Neveen Mansour).

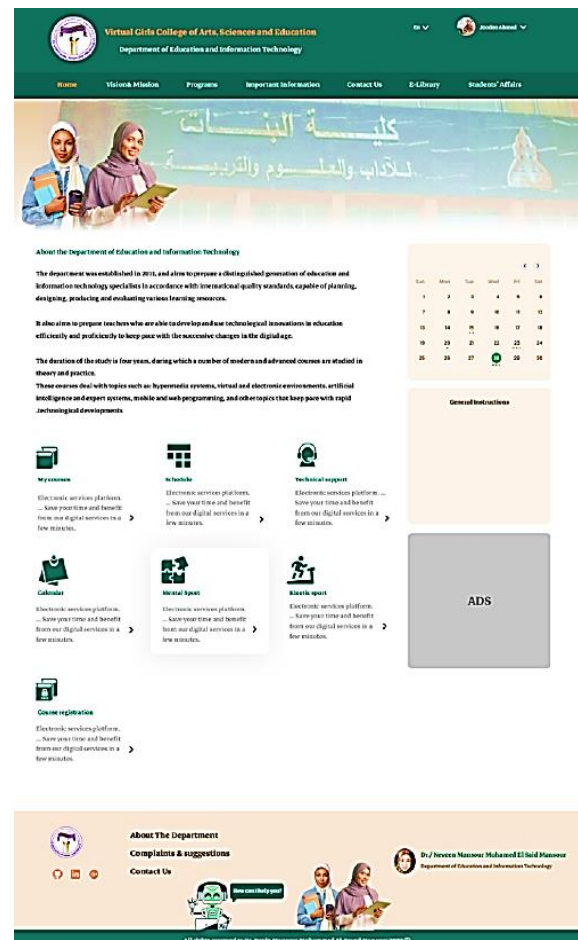
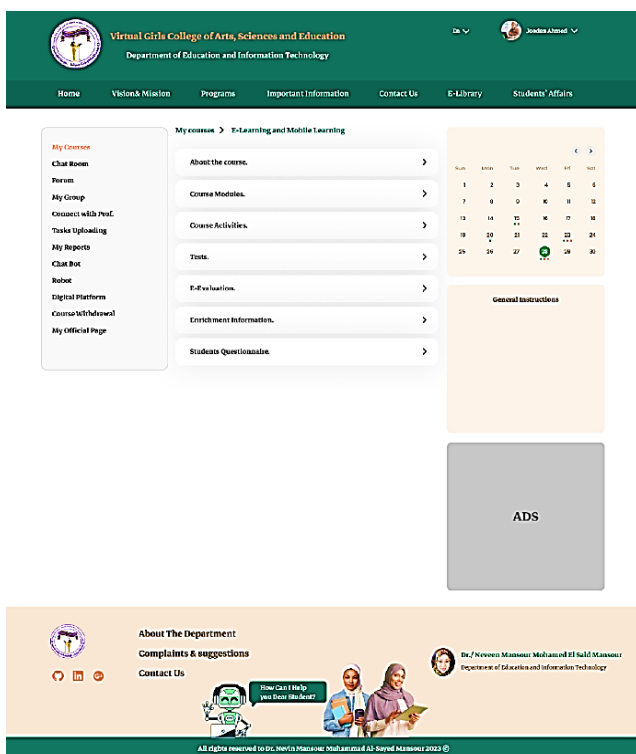


Figure 16. Student home page (Dr. Neveen Mansour).



A kinetic sport and a mental sport have also been added, where a kinetic sport that includes important physical exercises is shown after sitting in front of a computer or a laptop for a certain period, automatically for the student to take care of the health and physical side of him, as well as a mental sport that helps to activate him\ her mentally at intervals of time Specific and thoughtful, so that he does not feel bored from the continuous study, as well as helping him to practice mental exercises that learn to activate him, increase his motivation, and renew his enthusiasm for learning, as available on the main screen, the home page of the department that follows him, the vision and mission, and the programs offered by the department and illustrate the form of the page Home for the student (Figure 16).



Second: Faculty Members Portal

Figure 17. Course page (Dr. Neveen Mansour).

When the learner enters the courses, a screen appears with links that provide him with everything he needs to study the course without the need to be present in the educational institution, and without the need for human assistance, as there are chat rooms, a forum, a group in which the student shares with his classmates, a place to send messages to the teacher, A tool for raising assignments, learner progress reports, chat bot, educational bot, with the ability of the student to control showing and hiding the chat bot and the educational bot, a digital platform for simultaneous communication with the teacher and colleagues, the possibility of withdrawing from the course, the home page of the learner at the university, and it also includes the course itself, Course topics, educa-

tional activities, tests, evaluation, enrichment information, a questionnaire for students to evaluate the course, the professor, the methods and strategies used, it is also possible to go to the digital library of the department, student affairs, to pay expenses, make apologies or any other administrative procedure (Figure 17), and from Then a complete virtual learning environment is available to the student that enables him to learn, perform administrative procedures, motor and mental activities, view enrichment information and surf the Internet, all with complete control.

The portal begins with the opening screen of the university, through which it is possible to roam within the university and its various faculties, then log in with the username and password to display the main screen of the faculty member, which consists of the member's courses, his official page on the university, assignment examination tool, e-learning standards, and strategies To view the standards for designing and producing e-learning and e-courses, as well as the essential strategies that can be used to transfer e-learning, the digital platform for simultaneous communication with students, seminars and workshops, student reports, monitoring and tracking of gifted students, as well as monitoring and tracking of faltering students and their problems, with the possibility of using a robot Tutorial (Figure 18).



Figure 18. The main screen of the faculty member (Dr. Neveen Mansour).

By entering the course professor on one of his courses, a screen appears with all the tools and links that help him to help students, guide them, facilitate learning, monitor their learning, correct assignments, and send them where all the tools are

available to help with that, with links to contact the college administration, review regulations, and essential information It has (Figure 19), with the appearance of health guidelines, as well as the ability to write advertisements for students.



Figure 19. Faculty member courses page (Dr. Neveen Mansour).

### Third: Administrators Portal

It starts with the opening screen of the university, and by entering the username and password, the employee moves to the department to which he belongs. In it, he can contact all departments and students when needed.

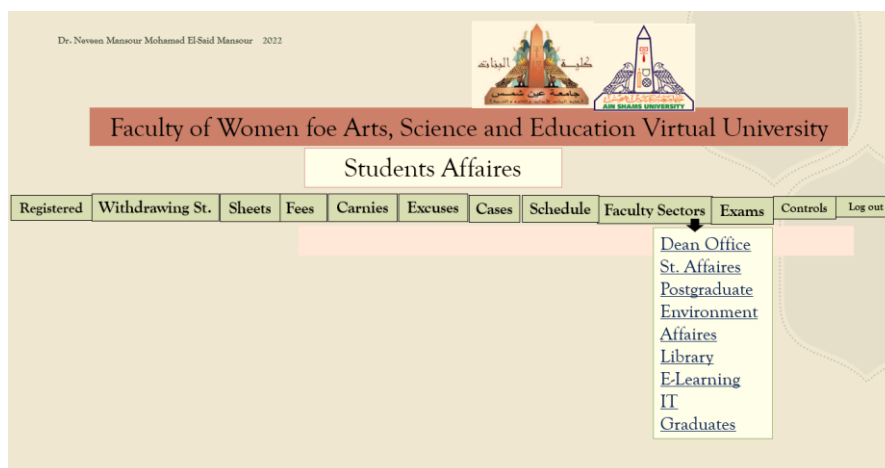


Figure 20. Administration portal (Dr. Neveen Mansour).

It became clear from the results of the questionnaires that there are deficiencies in several aspects of the digital platforms that were used during and after the COVID-19 pandemic, which require finding solutions to them to face such crises in the future, as it became clear that most students and several faculty members were not satisfied with the general form of the platforms, and the strategies. Students and faculty members expressed their needs for courses, training, workshops, and seminars to develop their skills in using the platforms. Professors also expressed their need for training on e-learning strategies, e-courses, and methods of design and production, as well as training in modern technologies that can be used to transfer learning and monitor it remotely.

In light of these results, a model for an e-learning environment for distance education was designed for Ain Shams University, which can be used for e-learning at a distance in general and for distance education in times of crises similar to COVID-19, where all the needs of the students were taken into account as the motor, psychological and mental aspects of the learner were taken into account, As well as linking all pages and portals in one place, as well as taking into account the needs of faculty members to follow up on learning, transfer it, check assignments and send feedback, conduct simultaneous meetings, view the regulations, enter the home page and contact the various departments, colleges and sectors of the university, as well as provide information about e-learning And its strategies, and holding workshops, training courses and seminars, as well as taking into account the administrative aspect by providing a portal for administrators that includes all administrative affairs, and providing ways to communicate with students, members and administrators at the university level.

## 8. Conclusion

This research identified the shortcomings in the e-learning platforms and environments for distance education created during and after COVID-19. Then, it identified the importance of designing a model for distance e-learning to face disasters and crises was evident in the light of a survey study that included the opinions of a sample of students and faculty members, through which some shortcomings in the digital education platforms used for distance education were revealed, which were considered in the proposed model in the current research. The model was compiled for an electronic learning environment for distance learning and other shortcomings in current connections while providing many positive educational and administrative services at the same time.

This model provides an integrated learning environment for distance education, considering the delivery of learning with practical strategies that consider the psychological, motor, and health aspects of the learners. It includes providing educational and procedural assistance in a variety of ways using an intelligent robot, chatbot, hints, scaffolding, and other support

methods. It also considers the motor aspects of learners by providing health instructions and exercises, as well as considering the time and duration of learning. It also provides educational games and mental sports for the learner. It links all important pages together through one portal for the student. Also, it has a comprehensive educational and entertainment library. In addition, it provides training to develop the digital skills required to deal with this virtual environment.

For professors/teachers, the proposed model provides them with multiple ways to design, produce, manage, and deliver content. It provides various training on e-learning strategies, workshops, multimedia files, and ready-made templates to help design, produce, and manage content and learning. There are various communication tools and multiple evaluation tools. Finally, this model is a proactive step to confront crises, disasters, and epidemics that may occur in the future and negatively affect education.

## Author Contributions

**Neveen Mansour Mohamed El-Said Mansour:** Conceptualization, Resources, Data curation, Software, Formal Analysis, Validation, Writing - original draft, Methodology, Writing - review & editing

**Aliaa Ali Essa Ali Elsayed:** Writing - review & editing

**Samah Farouk Al Morsy Alashkar:** Writing - review & editing

**Mona Faisal Ahmed Al Khatib:** Writing - review & editing

## Conflicts of Interest

The authors declare no conflicts of interest.

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