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## **"The impact of digitalization on university education: A field study after the COVID-19 pandemic"**

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### **ABSTRACT**

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#### **Keywords**

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Purpose: Identify the effectiveness of the use of technology in university education.

Method: Theory: Virtual Learning. Sample: (intentional) on (381) university students. Tool: questionnaire.

Importance: attempting to find appropriate mechanisms for students, lecturers, and universities, for the correct activation of e-learning.

Findings: Blended learning was the best choice for the respondents, as the use of technology in educational life has become an imperative necessity, which is currently represented in the (Distribution of the course on electronic CDs for students, instead of paper books \_ Communication between students and the lecturer using social networks \_ Electronic correction \_ Using electronic management systems \_ Developing digital libraries).

Conclusion: Blended learning must be well-planned to change the negative thinking towards it, where: Preparing the necessary technical requirements for it, such as providing a laptop and fast and free internet for each student and for each university professor. Training

professors and students on how to: use educational electronic programs, access digital libraries and trusted scientific websites, and conduct exams that are graded electronically. Training those in charge of designing electronic courses. Follow up on the performance of students, and they must be trained on the practical parts of the course. Professors show their interest in front of students to introduce technology in education and hold periodic seminars with students to identify the problems they face in order to work on solving them. Thus, blended learning has taken an (interactive) method instead of the method (of indoctrination), which was dominant over traditional education.

## **1. Introduction**

The global Covid-19 pandemic is an example of how universities are transitioning to new learning models<sup>(i)</sup>. After obligating precautionary measures, it became difficult to rely on traditional methods of education entirely, so Blended learning emerged as an alternative that can deal with the new conditions that are passing through the world, students began to use technology in distance learning using programs specially prepared for that such as Microsoft Teams. This is to help mitigate learning loss and to prevent further loss of human capital and contraction of the economy in the long term. Many countries have pursued options to take advantage of remote learning to manage and deal with the crisis<sup>(ii)</sup>.

### **1. 1. Research questions**

Q1: What is the effectiveness of using technology in university education?

**Q2: What is the suggested mechanism for activating the digitalization of education in universities?**

1. 2. The Field importance of research

I am attempting to find appropriate mechanisms for students, lecturers, and universities, for the correct activation of e-learning, because it has become an imperative in the modern world.

### 1. 3. Previous Studies

- 1) A Literature Review on Impact of COVID-19 Pandemic on Teaching and Learning – 2021<sup>(iii)</sup>

This article aims to provide the impact of the COVID-19 pandemic on online teaching. This pandemic has caused the greatest disruption to education systems in human history, and this has caused far-reaching changes in all aspects of our lives. Social distancing and restrictive movement policies have the latest major disruption to traditional educational practices, the reopening of universities after easing restrictions is another challenge with many new norms. The need of the hour is to innovate and implement an alternative education system. The COVID-19 pandemic has provided us with an opportunity to pave the way for the introduction and adaptation of digital learning.

- 2) Challenges and Opportunities for Higher Education Amid the COVID-19 Pandemic: The Philippine Context – 2020<sup>(iv)</sup>

This article presents how higher education has been affected by Covid-19 and how it can respond to future challenges. As the impact was not only in China where the virus originated, but all other higher education institutions. Educational countermeasures were taken to continue student education due to the need for alternative solutions. This article recommends that educational institutions conduct studies documenting the impact of the pandemic on the educational system, as there is a need to strengthen practices in the curricula and make them more responsive to the learning needs of students even outside the traditional classroom.

- 3) Online Delivery of Teaching and Laboratory Practices: Continuity of University Programmes during COVID-19 Pandemic – 2020<sup>(v)</sup>

The education of many universities around the world has been suspended, due to the spread of the COVID-19 virus. Consequently, an increasing number of universities have taken the necessary steps to shift teaching to an online or blended delivery method. Regardless of the measures taken, universities must maintain their high academic standards to achieve the learning outcomes associated with each program. This created a challenge across the higher education landscape, as academics had to shift to distance teaching. As a result, students did not receive face-to-face teaching, and access to laboratories was limited or nearly impossible.

#### 4) Self-Learning Strategy in Teaching Speech Skills to Face COVID-19 – 2020<sup>(vi)</sup>

This topic aims to shed light on the strategy of self-learning regarding to the development of speech skills during the Covid 19 pandemic. The type of research is descriptive, based on the method of studying the literature. The research concluded that the nature of development and the flow of knowledge and technology imposes new requirements on education aimed at teaching the individual how to teach himself by himself.

## 2. Methodology

### 2. 1. Virtual Learning Theory

Virtual learning environments provide new worlds in which technological applications are used in education as successful tools to complement traditional teaching methods, the concept of a virtual learning environment is dynamic due to the continuous development of digital technologies. Virtual learning can be defined as the transfer and delivery of various types of knowledge to learners using information technology<sup>(vii)</sup>.

The Internet helps collaborative learning through online discussions. Where learners engage in collaborative problem-solving with the help of a teacher, students use brainstorming to analyze and compare their ideas. The lecturer supports this learning process by providing learning resources and information to students, the lecturer provides feedback and input. This method highlights the need for discussion compared to memorization and reading<sup>(viii)</sup>.

Dewey's Community learning theory states that active learning enhances the experience. It is based on two foundations: the first is social reinforcement that shortens the distance and brings all learners to a specific place, giving the learner a sense of presence. The second is the ability to participate and enhance knowledge building for each learner through exchanging and building different experiences and knowledge<sup>(ix)</sup>.

Among the services provided by the Internet: The most famous database sources are (Google Scholar)& (Scopus: <https://www.scopus.com/sources.uri>) because they are considered suitable search engines as digital libraries. The most famous translation site is (Google Translate: <https://translate.google.com>), and the most famous grammar corrector is (Grammarly: <https://www.grammarly.com/>).

### 2.2. Survey design

A questionnaire, consisting of several open-ended questions, was designed to provide a space of freedom to answer. It was distributed to students at the university to answer it.

### 2.3. Sample

The research sample was determined to be (intentional) university students. The questionnaire form was applied to the number (381), by referring to the statistical equation to select the sample size from an unknown statistical community. The sample size was corrected, and this is the procedure followed when determining the sample size for a known statistical community as follows:

The study community is represented in: One of the Egyptian universities "Damietta University", the number of students in it when conducting the field study is:  $(32.907)^{(x)}$ . The following equation was used: Sample size (N) =  $(Z / S. E.)^2 \times (D^{(1-d)})$

whereas:

Z = the value of the standard variable at a certain level of confidence. The confidence level required here was assumed to be (95%), so the value of (Z) = 1.96 when referring to the table of standard values, representing the values of the areas under the curve of the moderate distribution.

S. E. = the permissible standard error, which is the percentage of error that the researcher at a certain confidence level is sure that the data he will obtain will not exceed it. Statisticians have included tolerance for error rate that does not exceed (0.05).

D = the degree of difference between the vocabulary of the statistical population, which is a fixed hypothetical value estimated by statisticians as = 0.5

Thus, the sample size is as follows:

$$\begin{aligned} & (1.96 \div 0.05)^2 \times (0.5^{(1-0.5)}) \\ & 1536.64 \times 0.25 = 384.16 \\ & = 385 \end{aligned}$$

$$\text{Sample size correction} = \frac{n1}{1 + ((n1 - 1) / n)}$$

whereas:

n1 = the sample size from an unknown population.

n = population size

Thus, the sample size correction is as follows:

$$\frac{385}{1 + \frac{(385 - 1) \div 32.907}{385}} = \frac{385}{1 + (384 \div 32.907)} = \frac{385}{1.01} = 381$$

## 2.4. Data analysis

Table No. (1): Gender variable

Categories	Frequencies	%
Male	67	17.6
Female	314	82.4
Total	381	100

The sample consisted of (82.4%) females, and (17.6%) males. This high percentage of females is due to the fact that when applying the questionnaire, the focus was on sociology students and graduates, as the research deals with the social phenomenon of e-learning. It is known in the university to which it was applied that the demand for sociology is more than for females.

Table No. (2): Age variable

Categories	Frequencies	%
18: 20 years old	127	36
21: 23 years old	210	59.5
24: 28 years old	16	4.5
Total	353	100

The number of students who mentioned their age was (353), while (28) preferred not to mention their age. The highest percentage was (59.5%) for the age range between 21 and 23 years, as this is the normal age for undergraduate students in the country in which the questionnaire was applied. The percentage (36%) for students at the age of 18: 20 years, which is the beginning of the university age. A small percentage (4.5%) was for the age of 24: 28 years, as these are the students who had circumstances that caused their academic delay, or were in postgraduate studies.

Table No. (3): Academic Major Variable

Categories	Frequencies	%
Sociology	192	50.4
Languages	15	4
Law	19	5
Commerce	50	13.1
Education	50	13.1
Engineering	6	1.6
Media	6	1.6
Computers, information, and artificial intelligence	10	2.6
Agriculture	7	1.8
Archeology	5	1.3
Libraries	3	0.8
Sciences	3	0.8
Nursing	2	0.5
Medicine	2	0.5
Tourism and Hotels	3	0.8
Applied Arts	3	0.8
pharmacy	2	0.5
Administrative Sciences	1	0.3
Physical therapy	2	0.5
Total	381	100

The sample consisted of (50.4%) of social science students, almost half because this research studies the phenomenon of e-learning from a social point of view. While the other half of the sample was various specialties, the focus was primarily on commerce with a percentage of (13.1%) because that college had already implemented the e-learning system and electronic exams for a long period before the emergence of Corona, it has more experience in this field. With the same percentage (13.1%), the focus was on a college of education for the two stages: secondary and primary education in the disciplines: Biology \_ Special Needs Education \_ Computer \_ Geography \_ Education Technology \_ Mathematics \_ Physical Education \_ Home Economics \_ History \_ Kindergarten..etc, this is because they are specialists in the education that is the subject of the survey, so they have more experience in this field. Other disciplines have diversified, such as Law \_ Languages (English, Arabic, French, Spanish) \_ Computers, Information and Artificial Intelligence \_ Agriculture \_ Engineering (Civil, Electricity, Aviation Technology) \_ Media \_ Archeology \_ Science (Chemistry) \_ Libraries \_ Tourism and Hotels \_ Applied Arts \_ Medicine \_ Pharmacy \_ Physical therapy \_ Nursing Administrative Sciences.

Table No. (4): Year Level variable

Categories	Frequencies	%
1st year	111	29.1
2nd year	27	7.1
3rd year	29	7.6
4th year	210	55.2
Postgraduate	4	1
Total	381	100

The focus was on the two levels: the 4th year with a percentage of (55.2%) and the 1st year with a rate of (29.1%). The 4th year was chosen because in most colleges it is the year of graduation, so they have the most experience in university studies, but they are less experienced in e-learning, as they only tried it during the Corona pandemic. The 1st year was chosen because they are the most experienced in applying e-learning since school. Thus, the sample has an element of neutrality regarding the application of e-learning, so there is no bias or opposition and the research results are as close as possible to reality.

Table No. (5): Positives variable of university e-learning

Categories	Frequencies	%
E-learning is a realistic solution in any circumstance	51	5.2
Technology makes learning more enjoyable, interactive, and easy	191	19.4
Students are learning at the appropriate times and places for them	152	15.4
Developing the electronic skills of lecturers and students	66	6.7
Saves time and effort	256	25.9
Saves spending	142	14.3
Easy to communicate directly with the lecturer	71	7.2
Promoting self-learning	58	5.9
Total	987	100

The questionnaire contained an open-type question about the advantages of university e-learning. It was available for students to answer with more than one variable. The researcher collected those answers. It was concluded that e-learning has many advantages as a flexible type of education, as follows: It came in first place with a rate of (25.9%): which saves time and effort; Attending the electronic lecture at home is a very important advantage, especially for students who live far from the university because they do not waste time on transportation. One of the students says that she no longer needs to wake up early to attend the morning lectures, and has the ability to get some

rest at any time, in addition to the ease of obtaining various scientific resources and studying many courses without trouble while she is at home. That is why one of the students also says that this type of education is more suitable for students with special needs who have difficulty moving due to their physical condition.

It appeared in second place with a percentage (19.4%) that: Technology makes learning more enjoyable, interactive, and easy. Since e-learning has social communication using the Internet, this is what young people have preferred in recent times. In addition to the possibility of diversity in the lecture presentation: (writing, audio, color graphics, videos) it makes teaching interactive by engaging students and discussing with them. One of the students confirmed that the ability of e-learning to evolve over time constantly helps to simplify information for her and quickly understand it. Another student pointed out that the availability of the electronic course in PDF format is a significant advantage. A student added her opinion that technology makes it easier for her to access and obtain scholarships, as technology improves her quality of life. Another student said that the use of e-learning helps to overcome the weakness of the financial capabilities of some universities, as there are lecture halls that are not equipped with the simplest tools such as a mic, which hinders listening to the lecture's explanation.

Then, in third place with a rate of (15.4%), an advantage emerged: Students are learning at the appropriate times and places for them. Thus, the Internet allows education to a large number of students without being restricted to providing them with a lecture hall, and the scientific material is available throughout the day. One of the students mentioned that in the case of a recorded lecture that is not restricted to a specific date, this enables her to stop and repeat more than once so that she can understand. E-learning provides a private space for learning without interference from other students, and provides comfort and freedom in the way of sitting and movement, especially for patients. Another student said that she can receive education at a time when she feels energetic, as she is able to put in the effort. One of the students said that e-learning provides him with a job opportunity to provide the money he needs to study, because e-learning does not impose certain times on him to attend lectures, so it does not conflict with work times.

It came in fourth place with a rate of (14.3%) it: saves spending; Transportation or housing near the university, and educational paper supplies. It came in fifth place with a rate of (7.2%): Easy to communicate directly with the lecturer. One of the students said: that e-learning makes her communicate quickly with the course professor, without feeling embarrassed to talk to her professor because she was embarrassed if she made a mistake in answering

the questions in front of her colleagues in the lecture hall. In addition to online communication with the professor being free of place or time, e-learning also helps to communicate with students worldwide.

In sixth place with a rate of (6.7%) came as positive: developing the electronic skills of lecturers and students. Thus, the result of this is the ease of applying electronic tests, because there is training throughout the school year to keep pace with the modern era in adapting technology to the service of education. Then (5.9%) stated that e-learning works: Promoting self-learning. One of the students said that e-learning provides her with the opportunity to learn more broadly and in a better way, as it gives her the ability to search and access a huge amount of knowledge and information, in addition to the ease of storing that information. Another student said: E-learning enables her to follow up on everything new in the field of specialization, and helps her to be accurate, focus on important ideas, and absorb information. It also works on developing intelligence because it depends on thinking and understanding, not memorization.

Finally, (5.2%) stated that: E-learning is a realistic solution in any circumstance, as it maintains health at the time of a disease pandemic, and also helps in not disrupting studies in bad weather.

Table No. (6): Negatives variable of university e-learning

Categories	Frequencies	%
Completely dependent on technology	197	25.9
Poor experience in dealing with technology	81	10.7
Lack of face-to-face interaction and dialogue with the course professor	209	27.5
Difficulty understanding well	59	7.8
Students are busy with other things online rather than learning	51	6.7
Disproportionate to the poor	125	16.4
Difficulty in convincing the effectiveness of e-learning	16	2.1
Sitting for long periods in front of electronic devices leads to visual fatigue	15	2
Disadvantages of electronic exams	7	0.9
Total	760	100

Among the most prominent negatives of university e-learning: is the lack of face-to-face interaction and dialogue with the course professor, which came in first place with a percentage (of 27.5%). One student said that this leads to a weak incentive to compete among students and that she feels isolated and

unreactive. Another student said she could not concentrate, especially when the lecture was long, reducing her desire for education. One of the students also noted that the lack of participation among students has led to a decrease in the level of her social interaction skills due to the decrease in social friction with her colleagues at the university. In summary, this was confirmed by one of the students, who said that the student needs a sense of follow-up from his professor, and eye contact during the explanation.

In the second place, a percentage (25.9%) confirmed that e-learning is completely dependent on technology and a high internet speed, while the technological capabilities in some countries are weak, such as (interruption of the internet or electricity - the lack of prompt maintenance of devices) which negatively affects the educational process. One of the students said that one of the problems resulting from this is the occurrence of a severe slowdown or suspension of the university's website, due to the pressure of students to enter the site to obtain their grades at the end of the year at the time the result appears.

It came in third place with a rate of (16.4%) which is disproportionate to the poor. This is in agreement with a study (Jerome V. Cleofas & Ian Christopher N. Rocha, 2021) which found that students from poor families who do not own laptops have higher levels of anxiety<sup>(xi)</sup>. E-learning requires the provision of a modern electronic device that has the ability to deal with electronic course CDs and the Internet, in addition to paying the monthly subscription to provide Internet service, as well as the need for a printer to print the electronic course. One student said that the result is individual differences in access to education.

The problem of poor experience in dealing with technology came in fourth place with a rate of (10.7%). Some students complained about the poor ability of the elderly professors, in particular, to deal with modern devices. Also, some students are not skilled in dealing with educational programs because they are accustomed to paper and pen and writing in the lecture. One of the students said that this had led to the student's lack of interest in attending electronic lectures and a lack of seriousness and commitment. One of the students said that she hears some students talking during the electronic lecture because the course professor did not adjust the program settings to turn off the students' mic, which leads to confusion.

It appeared in fifth place with a percentage of (7.8%) that it was difficult to understand well and to provide information to students in the wrong way, especially for the practical and applied parts of the course. One of the students said that e-learning is not suitable for studies that need: hands-on experience, practice, and life experiences. In addition to saying by one of the students that

one of the most important problems that she faced is that the professor is not always available, she means that in the case of asynchronous e-learning (which is when the student obtains the scientific material that the course professor has set for him on the Internet, it is not required that the student and the professor be present at the same time together On the Internet, but both choose the appropriate timing for them) This led to her not receiving immediate feedback and not being able to directly inquire about her questions.

In sixth place (6.7%), many students emphasize that they are busy with other things online rather than learning. One student said that there are so many attractions on the Internet that he often registers himself in the tutorial, then browses other sites on the Internet, and that he may also be busy with things around him at home or on the street. This leads to professors not being sure of the student's attention during simultaneous teaching (both teacher and students are both online) unless they open the camera. Here, one of the students said she was ashamed to turn on the camera. Also, in the case of the lectures that the doctor records on the date of the course, and then leave them saved on the Internet for students to refer to when needed, this made some students guarantee the presence of the lecture at any time, which makes them postpone studying, so the entire course accumulates on them before entering the exam.

Difficulty in convincing the effectiveness of e-learning came in seventh place with a rate of (2.1%). One of the students said that this is because e-learning is applied when a sudden need leads to not good results. One student said that businesses question the credibility of e-learning. However, the percentage (2%) converged to the problem of sitting for long periods in front of electronic devices which leads to visual fatigue, and this was agreed with the study of (Jindong Liu, Biying Wu & Jiayu Qu, 2022)<sup>(xii)</sup>. One of the students also referred to a lack of movement and laziness.

Finally, in ninth place with a rate of (0.9%) came the disadvantages of electronic exams, it was stated that the electronic correction does not correspond to the essay questions, but rather to the type of questions (multiple choice, true or false). One of the students said that this may program the student to memorize and not be able to express, and may increase the chances of cheating among students while answering.

Table No. (7): What type of education is best for students?

Categories	Frequencies	%
E-Learning	68	17.9
Traditional Education	90	23.6
Blended learning	223	58.5
Total	381	100

Blended learning was the best choice by (58.5%) of the respondents. This is because it is a type of education that combines e-learning and traditional education. Many students said that they have benefited from the advantages of modern technology in education. Still, in any case, the conventional face-to-face lectures with the course professor are indispensable, and the technology can then be used in anything else such as exams.

The second choice that students preferred is traditional education with a percentage of (23.6%), where teaching is in the presence of the student and professor together at the university without using any kind of technology in the educational process. E-learning was the last choice (17.9%) as e-learning is education through the use of electronic devices and the Internet only without face-to-face interaction, while the most important advantage it provides is the possibility of learning from anywhere.

### 3. Technology in University Education

University digital transformation is evident in Teaching Online using mobile devices, the technology of building an electronic classroom, online student activities, electronic discussions, the ability to track students' movements, Open Online Courses<sup>(xiii)</sup>, open educational resources<sup>(xiv)</sup>, electronic whiteboard, electronic correction, Learn what's new in science around the world.

It is noted that the largest and most successful technology companies in the world such as Google, Microsoft, Amazon, and Zoom have expanded their educational services very quickly to deal with the Corona crisis as a great business opportunity to make profits, and they have been marketing their products online on social media extensively<sup>(xv)</sup>. In addition to displaying many advertisements on Facebook for online education and obtaining accredited degrees.

Although this is one of the most effective learning techniques, students rarely use these methods, because they underestimate their potential gains<sup>(xvi)</sup>. Rather, they feel overwhelmed by this drastic change in ways of learning<sup>(xvii)</sup>.

#### 4. Results

The COVID-19 crisis has presented a major challenge to education systems. Institutions had to meet the needs of students by level and field of study, and Universities used distance learning<sup>(xviii)</sup>. This has left some within the education system feeling dysfunctional and disoriented, while it has enabled others to experiment and innovate in teaching and learning practices<sup>(xix)</sup>.

Whatever the case, universities are now dealing with e-learning as an essential method of education, as the use of technology in educational life has become an imperative necessity, which is currently represented in the:

- Distribution of the course on electronic CDs for students, instead of paper books.

(The positives): Ease of keeping all the courses on the personal mobile, and referring to them at any time instead of the difficulty of carrying all the paper textbooks when going to the university, ease of reviewing the course quickly before the lecture.

(Disadvantages): The necessity of providing an electronic device to run the cylinder on. the difficulty of remembering the course from electronic CDs, so students print it on paper, which represents a financial burden and an additional effort for them because they are not accustomed to studying from electronic devices before. This was in contrast to the paper book, which is less expensive and easier to obtain and get used to from a young age.

- Communication between students and the lecturer using social networks. These networks were used at the height of the COVID-19 outbreak because they are an easy and quick way to communicate urgent decisions that were issued by universities to organize the educational process, and those networks continued until now. The most famous of these networks are WhatsApp and Facebook groups. Here it should also be noted that each university and each college has its own official website, which includes: activities of the academic departments, activities for students, announcements of conferences, seminars, and scholarships, the latest news of higher education and scientific research ..etc.
- Electronic correction of some exams, as desired by the course professor. One of the students mentioned that this type of correction is very consistent with her bad handwriting, which used to reduce her bikes a lot when taking exams that depend on papers and handwriting, but when using electronic correction, she does not need to write with her hand because she depends on shading the correct answers only, which decreases the risk, Her bikes rate a lot.

- Using electronic management systems, which are available on the official website of the university, such as:

(Ibn Al-Haytham System for Student Affairs Management<sup>(xx)</sup>): It contains detailed reports on the personal and academic data of students. Each student has a page that he opens with a username and password. On each student's page is his lecture schedule, exam sitting number, and results over the years of his education at the university. It is done by providing technical support services to students using e-mail between students and supervisors. It has an app for smartphones.

(Ibn Al-Haytham System for Managing Graduates' Affairs<sup>(xxi)</sup>): It provides detailed reports on students' personal and academic data, announcements of students' results, and printing of graduation certificates. It contains an internal email that works between all users and supervisors to ensure the performance of the technical support service. It includes contact information with the university, and the university graduates' forum to communicate with colleagues.

(Ibn Al-Haytham System for Postgraduate Studies Management<sup>(xxii)</sup>): It provides access to students' data and results. Provides a private and secure entrance for control members to enter and review results. Students wishing to apply for postgraduate studies are allowed to enter and record progress data on the system.

Launching an (Exam Schedule application) on the Android system that specializes in exam schedules for students in all faculties, in order to make it easier for them to identify their exam schedules and save them on their mobile devices. The application can be accessed by logging into the Google Play Store<sup>(xxiii)</sup>.



- The Egyptian Knowledge Bank (it is the world's largest digital library granting unlimited resources exclusively to Egyptians)<sup>(xxiv)</sup>, has entered into an agreement<sup>(xxv)</sup> with the publisher SPRINGER NATURE (it is the most famous international publisher of refereed research at the Q1 level); It states that the Science, Technology & Innovation Funding Authority (STDF) will fund Egyptian research that is accepted for publication in one of the

international journals affiliated with the publisher SPRINGER NATURE, in cooperation with the Egyptian Knowledge Bank. A symposium was held for faculty members in Egyptian universities, entitled (Open Access for Egypt), which discussed the most important provisions of the agreement, how to apply for funding and benefit from it, and the journals participating in the agreement.



A sample<sup>(xxvi)</sup> certificate of attendance at the symposium on the GoToWebinar program, to encourage Egyptian researchers to publish international scientific

## 5. Conclusion

Lifelong learning has become one of the requirements to adapt to the digital society<sup>(xxvii)</sup>. In the technological arms race, technological literacy in education must be eliminated<sup>(xxviii)</sup>, and individuals' minds must be programmed to use electronic devices for education instead of using them for useless things. Thus, universities have helped students benefit from the COVID-19 experience and emerge from it more robustly than before.

### 5. 1. A proposed mechanism to activate blended learning in universities

Since blended learning is the most preferred type among the study sample, their opinions were collected as follows:

Blended learning must be well-planned to change the negative thinking towards it and highlight its importance, through spreading the culture of e-learning, where:

Preparing the necessary technical requirements for it, such as providing a laptop and fast and free internet for each student and for each university professor. Training professors and students on how to: use educational electronic programs, access digital libraries and trusted scientific websites, and conduct exams that are graded electronically. Training those in charge of designing electronic courses. The lectures will be face-to-face in the university lecture hall, except in the case of extreme necessity, they will be remote

lectures on the Internet. The lecture is given at the university and this coincides with the opening of the online lecture from inside the lecture hall for students who are unable to attend the university. Follow up on the performance of students, and they must be trained on the practical parts of the course. Professors show their interest in front of students to introduce technology in education and hold periodic seminars with students to identify the problems they face in order to work on solving them. Many students preferred electronic exams because they are easy to take achieve accuracy in results and save time, effort, and money and lead to the appearance of their grades faster, they suggest providing a question bank that is constantly updated for training in the form of exams.

Thus, blended learning has taken an (interactive) method instead of the method (of indoctrination), which was dominant over traditional education.

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