

## Efficiency Degree of Emergency Digital Teaching during Covid-19 Pandemic on Achieving Students' Quality Learning Outcomes in Saudi Universities

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### Abstract

The current study aimed to determine the efficiency degree of emergency digital teaching during the covid-19 pandemic in achieving students' quality learning outcomes. This study aims to enrich the theoretical literature on managing the teaching and learning processes during crises to help faculty and students adapt to emergency conditions. It clarifies the importance of planning and preparation for non-traditional learning environments based on modern technologies. To achieve this aim, the researcher used a descriptive method. A 23-item survey was developed and answered by 360 teaching staff in some Saudi universities who were part of the study population from 2021- to 2022. According to the research sample, emergency digital education during the covid-19 epidemic was of moderate efficiency on learning outcomes. The arithmetic mean of this dimension was (3.41). Meanwhile, the result exhibited a statistically significant effect at the significance level ( $\alpha \leq 0.05$ ) for the years of experience variable. Furthermore, the results identified factors that could have influenced the efficiency degree of emergency digital teaching during the Covid-19 pandemic in achieving students' quality learning outcomes. The second dimension averaged high, reaching (3.72). The study came out with executive recommendations based on its results.

**Keywords:** Covid-19 pandemic, Emergency Digital Teaching, Higher Education, Quality learning outcomes, teaching in a crisis

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## Introduction

Since March 10, 2020, universities have found themselves obligated to find ways for achieving students learning outcomes to overcome the challenges imposed by the Covid-19 Pandemic, especially during the curfew where traditional direct education was no longer possible. This need coincided with previous calls for educational systems to keep pace with the successive changes, including non-traditional forms, such as distance education and e-learning, including both modern technologies and means. Fisher (2013) believes that using such modern techniques in teaching has become an urgent necessity and that digital tools should always be the available option, and not only temporary procedures planned to be used once in a while. More recommendations came from an Arab conference regarding the need to prepare appropriate plans and policies for the implementation of e-learning in a manner that would suit the needs and conditions of Arab countries; and the need to design, develop and employ e-learning communities' systems to achieve learning outcomes, with emphasis on thinking and social skills, participatory and cooperative learning (EAET, 2013; Salem, 2004).

However, resorting to contemporary alternatives that dispense with traditional education patterns does not guarantee good results unless it is well-planned and obstacles and challenges are eliminated. The results reached by Wright (2014) indicated that the initial enthusiasm of officials in the United States of America towards online university education began to wane in light of reports of poor learning outcomes, caused in part by the limited capabilities of traditional online courses management systems. The study hypothesized that the Vigilant Online Learning Systems (VOLS) would be more suitable for junior college students than the traditional online course management system. Hence, universities quickly resorted to alternatives to the traditional classroom in an effort to compensate students for attending university campuses through their reliance on distance education patterns. Most of these patterns were represented in virtual platforms or e-learning, or what some call Emergency Digital Teaching or Emergency Remote Teaching via the Internet (Ferri, Grifoni & Guzzo, 2020), or however, whatever form of education was adopted, some studies revealed there were serious weaknesses of infrastructure and inept technological preparation of faculty members.

Other studies have proven the usefulness of modern education forms such as distance education, online education and e-learning and their effectiveness on developing both academic achievement and attitudes towards learning. Such educational patterns also help in achieving planned learning outcomes, provided that they are well-planned and well-prepared and that teachers have the skills to deal with its techniques (Al-Reeh, 2018; Al-Baitar, 2017, 2020). It has become clear that the need to create educational environments that support and stimulate the learning processes, in addition to developing self-learning skills among university students to raise their competencies and become compatible with the requirements of labor markets (Al-Omari & Al-Mukhtar 2019; Abbassi, Meguellati & Souaci, 2022). The Kingdom of Saudi Arabia has gone through the experience of distance learning and e-learning in the Saudi Electronic University and King Abdulaziz University (KAU), where e-learning and blended learning has been used for more than a decade under the umbrella of the Deanship of Distance Education. Some studies revealed that the majority of the participants had positive attitudes towards e-learning and that students were ready to go online to avoid any academic loss due to the Covid-19 Pandemic (Bahanshal & Khan, 2021).

Saudi universities, like others, were surprised by the consequences of the Covid-19 crisis on education, so they resorted to some education forms that could replace face-to-face, traditional

teaching. So, they used online platforms such as Blackboard, Zoom technology, Microsoft Teams, and some social media such as WhatsApp. Such media used by the course were effective to some extent according to the views of those in charge of the educational process in universities, which necessitated conducting a study to find out the efficiency degree of these education forms. Hence, the problem of the study in its quest to answer its main question: What is the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes? It clarifies the importance of planning and preparation for non-traditional learning environments based on modern technologies. This study sought to achieve the following research objectives:

1. Determining the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes from the point of view of the study sample.
2. Knowing the effect of the variables (gender, years of experience, and specialization) on the study sample's estimate of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes.
3. Determining the factors that affected the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes from the point of view of the study sample.
4. Providing executive recommendations to the relevant authorities based on the results of the study.

The study attempted to answer the following questions.

1. To what extent are there statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) between the study sample members in their estimation of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes due to the variables of gender, years of experience, specialization?
2. What are the factors that affected the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes?

As for its practical importance, it is expected that this study will benefit the following parties:

1. Universities and those responsible for the quality of the educational process and its development.
2. Researchers and academics in the field of higher education management and quality who would like to conduct further studies in this regard.

## Literature Review

The concept of traditional education refers to the educational process between the teacher and students directly and requires their physical presence in the same place and time during the classroom (insider, 2022). However, after reviewing the relevant literature, we find that non-traditional learning forms include participatory e-learning, synchronous e-learning, asynchronous e-learning, emergency remote teaching, emergency digital teaching, blended learning, distance learning (Ejdys & Kozłowska, 2021),(Al-Reeh, 2018),(Garrison & Vaughan, 2008). These e-learning forms had positive impacts on learners "*The attractiveness of e-learning as a form of teaching gained in importance, mainly among students*" (Ejdys & Kozłowska, 2021, p 13).

In distance education, teachers use e-learning to deliver information to their students: e-learning is a modern educational system whose objective is to provide educational programs using

information technology, the Internet, and the accompanying hardware and software (Salem, 2004). Communication in this type of education is through local and international internet networks or via CDs and similar digital content preservation tools, allowing learners to choose the content that suits them and enabling them to choose the suitable time and place. The teacher in this type of education is like a private teacher tutor (Janby, 2019). Among the types of e-learning is self-paced learning. Another type of e-learning in which the teacher is a facilitator of the learning process where the cooperation between the students themselves. The third is considered a hybrid between the two previous types (Ghirardini, 2011). E-Learning falls into two types: synchronous e-learning and asynchronous e-learning (ETEC, 2020a). Synchronous: the teacher is separated from the learners spatially, with his meeting with them temporally, and the communication between them is direct, through direct conversations, video conferences, and virtual classes. Asynchronous: the teacher is separated from the students in time and space so that each student chooses the times and places that suit him/her to learn. Perhaps the most famous university in the Kingdom that has used this type of education is King Abdulaziz University (KAU) (Bahanshal & Khan, 2021).

Saudi universities have used digital technologies via the Internet at the beginning of the Covid-19 Pandemic. WhatsApp was also used by some teachers who did not have adequate skills in dealing with online platforms specified by the universities. This took place by sending the learning material via WhatsApp, followed by, and followed by an audio message explaining or commenting on the text. However, during the pandemic, the use of distance education via the Internet, this experience did not get its right from preparation and planning, so it is correct to call it "Emergency Remote Teaching via the internet (Ferri, et al., 2020), or emergency digital teaching (Gonzalez et al., 2022), this name was adopted by the researcher in this study.

Learning Outcomes in Saudi higher education are the basis upon which all procedures for designing academic programs and curricula are established. Moreover, they are also the basis for evaluation. Today, they are the focus of all quality and academic accreditation processes and the main incentive for educational reform movements and higher education worldwide. Learning outcomes in higher education in Saudi Arabia have been set and defined in the National Qualifications Framework by distributing them into three domains (ETEC, 2020a):

1. Knowledge and understanding of the facts, principles, theories, processes, and procedures involved in the field of learning, work, or profession in which the student will work.
2. Skills: what the graduate can do for continuous learning and work or profession. These skills include three sections:
  - Cognitive skills: These include applying knowledge, critical thinking skills, problem solving, investigation, and creative thinking.
  - Practical skills: These include applying knowledge, appropriate tools and devices, the skillful application of motor and manual skills.
  - Communication and information technology skills: These include written, verbal, and nonverbal communication and numerical skills (the application of arithmetic operations and the use and production of information and communication technology).
3. Values: The principles and criteria the graduate shows, guiding him/her to succeed in life, work, or profession, including:
  - Academic and professional values and ethics.
  - Continuous self-learning and independence.
  - Work with a team and take responsibility.

*Previous Studies*

The prior studies that dealt with forms of education, which were brought up in this research, can be summarized as follows:

- Ferri et al. (2020) aimed to analyze the benefits and the challenges facing unexpected remote teaching based on the experiences of the Covid-19 Pandemic, which also referred to an Italian case study. The study revealed several challenges that are facing remote education. The first challenge is technological, which mainly related to the lack of necessary devices for the students and the unreliability of internet connections. Second is the pedagogical challenges which are primarily associated with the lack of digital skills of both teachers and students, the lack of motivation and interactivity among the students, and the lack of organized content versus the massive amount of online resources. Finally, social challenges related to the improper study environment at home, the decrease or lack of support of remotely working parents, and the low interactivity between the students and their teachers.
- Ejdys and Kozłowska (2021) aimed to study the change in acceptance degree of e-learning at higher education in 2020 - 2021. The surveys conducted on both teachers and students showed that the students are more tolerant of e-learning than the teachers. In their opinion, e-learning saves time, improves easier communication with teachers, and enables flexible classes schedules. Unfortunately, e-learning had a less positive impact on the teachers.
- Sayyaf (2021) intended to study the effect of the Covid-19 Pandemic on the e-learning's technical and psychological challenges facing faculty members and students of the University of Bisha, Saudi Arabia. A survey with a sample of 343 faculty members and 1981 students was conducted, and the results indicated that the challenges facing the students were the lack of technological awareness, the lack of proper training on computer and the Internet, the fear of accessing non-educational websites, and the fear of making mistakes while using the internet. Also, they encountered some technical issues such as sudden cuts for the Internet and power and the failure of many students to fully accept the idea of engaging in e-learning and the adverse effects of the home quarantine. However, the faculty member's challenges included the weak infrastructure and lack of equipment, continuous assessment process, class management challenge, and designing the appropriate content, activities, and tasks.
- Ouyaba (2020) used the descriptive-analytical approach to assess a process of transition all courses online due to universities closure during the Pandemic. The study attempted to understand the plan drawn up by the instructions of the Ministry of Higher Education to confront the urgent situation. An applied study was conducted on students of the Faculty of Economics at the University of Ghardaia, where an electronic questionnaire was carried out on a sample of 100 individuals. The results showed that there was an increasing adaptation to the crisis and an acceptable readiness for distance learning and that students preferred platforms that were characterized by asynchronous interaction. However, the level of interaction was low, and there was a variance between levels and specialization. The study concluded that there were physical and human obstacles that limited students' interaction with the activities available on various platforms.
- Gonzalez et al. (2022) conducted a qualitative study on 200 Information Technology students to determine the impact of transition experience from face-to-face to remote learning during the COVID-19 Pandemic in Norway. Results showed that the students felt the transition to digital learning had positive effects on their lives, such as more time to study, flexibility to study through recorded lectures that can be reviewed frequently and at any time. There were

adverse effects such as lack of structure, more distractions, and violation of privacy when their cameras needed to be turned on.

- Alshehri et al. (2020) highlighted the experience of a mid-size college transition process from face-to-face to fully online teaching in Saudi Arabia due to COVID-19 Pandemic. According to the study, the difficulties associated with the shift necessitated the reprioritizing of education, putting online education upfront, and reconsidering biological threats as risks possibilities that could obstruct regular education.
- Firmansyah et al. (2021) studied executed at one of the Indonesian state universities to reveal the transition from face-to-face to fully online learning due to Covid-19 from students' perspective. A narrative approach was used in this research where the data were collected through online interviews. It was processed based on the results of focus group discussions and studies related to the execution of online learning during the Pandemic. The results showed that the students were tolerant towards e-learning. In their perception, online learning had more flexibility and efficiency, and was also operative in terms of time management, costs reduction, and energy and resources saving. However, the students mentioned that they encountered some obstacles and challenges such as low interactivity between the teacher and students, sudden changes in schedule, inadequate facilities, and weak utilization of learning media.
- Perifanou et al. (2021) investigated teachers' perceptions of their digital skills for performing their professional responsibilities and teaching during the Pandemic. A survey was conducted on a sample of more than eight hundred teachers to find out their implementation of digital technologies in their work. The answers revealed that they mostly utilized digital tools for assessing and developing educational resources in addition to teaching. They also used digital tools for assessing students' work and even for interacting and communicating with their students. Such tools, however, were scarcely implemented for giving feedback on students' performance or educational resources. They were not able to cope with management and long-term planning, let alone the development of digital education in general.

Previous studies were in accordance in terms of the descriptive approach, with the exception of (Ferri et al., 2020; Gonzalez et al., 2022), which used the qualitative approach, (Firmansyah et al., 2021) used a narrative approach. All of the studies used the questionnaire as a tool for data collection and were in accordance with the notion of the non-traditional form of education, such as distance education and e-learning, and the challenges facing these forms, such as the study by Sayyaf (2021), Ejdyś and Kozłowska (2021), Alshehri et al.(2020), and Gonzalez et al. (2022). Some of these studies focused on estimating the impact of these forms on the quality of the educational process and the quality of its outputs, such as the study by Gonzalez et al. (2022), Perifanou et al. (2021) and Janby, (2019). There were some obstacles that limited the effectiveness of non-traditional forms, as shown by the study by Ejdyś and Kozłowska (2021), Firmansyah et al. (2021) and Sayyaf (2021)

These studies have agreed in their results on the importance of digital-based education in achieving the quality of the educational process. They also agreed that there was a need to pay more attention to these forms as a permanent method and not just resort to them only in difficult circumstances.

Here are some salient terms used in this study. *Emergency Digital Teaching*: Digital teaching is a modern use of technology and its tools in the teaching and learning process, which is known as technology-enhanced learning (TEL) or e-learning” ((IAD, 2022). Some called it during the pandemic “distance teaching and learning in emergencies. One of the characteristics of this form of teaching is its lack of planning because it came in response to a crisis that did not enable teachers to plan well and prepare for digital teaching (Garrison & Vaughan, 2008). The researcher defines digital teaching procedurally in this study as the emergency transition from traditional education to digital technologies in delivering science materials to students. *Covid-19 Pandemic*: The World Health Organization defines Covid-19 as the disease caused by the emerging coronavirus called SARS-CoV-2. First discovered on December 31, 2019, it was a new strain of the coronavirus that had not been detected in humans (WHO, 2022). The researcher adopts this definition as a procedural definition for the purposes of this study. *Learning Outcomes (LOs)*: WHO (2022) describe Los as statements that express what knowledge and skills learners are expected to possess at the end of a period of learning and of how that learning is to be demonstrated. The researcher defines LOs procedurally in this study as: What the descriptions of the academic programs and their courses stipulate as indicative of what students are expected to achieve in terms of knowledge, skills and values after completing the requirements of those programs and courses.

The current study agrees with previous studies in selecting the descriptive approach and its reliance on the questionnaire as a tool for data collection. However, it differs in its focus on identifying the learning outcomes targeted in the educational process in Saudi universities. These are the outcomes that were formulated in the specifications of university programs and courses, based basically on the National Qualifications Framework (NQF) ((ETEC), 2020a). It also differs in its focus on measuring the efficiency degree of emergency digital teaching, which Saudi universities have resorted to achieve student-learning outcomes.

## Methods

This part of the study includes a description of the method used, population, sample, the data collection tool, validity, reliability, and the process of correcting it. The following is an exposition of the methods and procedures. The descriptive approach was implemented based on the study’s objectives, the questions, and the nature of its problem. The researcher collected the data and theoretical information from their original sources and previous studies; then, he developed a questionnaire to collect field data, which aimed to estimate the efficiency degree of emergency digital teaching during the Covid-19 Pandemic on achieving students’ quality learning outcomes in Saudi universities.

The population of the study consisted of faculty members in Saudi universities. The questionnaire was distributed to 400 individuals from the study community in a random manner. The number of questionnaires considered for the purposes of analysis was 360, distributed according to Table one, which shows the characteristics of the research sample, taken from IMSIU, KSU.

Table1. *Distribution of the sample according to the variables of job, gender, years of experience and specialization*

	VARIABLES	COUNT	PERCENTAGE
Gender	Male	32	89%
	Female	40	11%
Experience	Less than 10 Years	26	72%
	More than 10 years	10	28%
Major	Humanities	40	11%
	Scientific	32	89%
Total		360	100%

### *Research Instruments*

After reviewing previous studies, relevant theoretical literature and then surveying the opinions of a sample of experienced faculty members in Saudi universities, the study tool was built. It consists of a 5-item questionnaire, where the participants are required to respond to statements (Strongly Agree, Agree, Somewhat Agree, Disagree and Strongly Disagree). to collect data and answer the study's questions. After conducting the necessary operations to ensure its validity and reliability, it settled on 23 items distributed over two dimensions, according to the following procedures:

### *Validity of the Tool*

The apparent validity of the study tool was confirmed by presenting the items in their initial form to a group of specialized arbitrators, who refereed the items contained in the questionnaire in terms of clarity of the linguistic formulation of the items and their relevance to the field. Based on their observations, three items were deleted, and some items were re-drafted. 80% of the arbitrators gave their consent. Thus, the questionnaire consisted of 23 items distributed in two dimensions: the first contained 17 items (1-17), and the second contained six items (18- 23).

### *Tool Stability*

To assess and determine the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes in Saudi universities, estimates (cut-off scores) have been developed based on the following equation:  $(5-1) \div 3 = 1.33$ , including  $1 + 1.33 = 2.33$ ; hence the efficiency degree is low between 1 - 2.33, average between 2.34-3.67, and high between 3.68-5. The questionnaire stability was verified by calculating the scale's internal consistency using Cronbach's alpha after it was applied to a pilot sample consisting of 30 individuals from outside the study sample. The stability of the questionnaire ranged between 0.88 and 0.92, and these numbers are suitable for adopting the study tool to collect its data. According to the five-point Likert Scale, the response was determined on the questionnaire items at five levels. Accordingly, degree of (5) was given to strongly agree, a degree of (4) to agree, a degree of (3) to somewhat agree, a degree of (2) to disagree, and a degree of (1) to strongly disagree.

### *Research Procedures*

To analyze the primary data of the research, the researcher encoded and entered it into the SPSS computer system, and the necessary treatments were carried out to reach the results that could answer the questions of the study as follows:



- Using the correlation coefficient to measure the degree of correlation of the phrases with the total score of the questionnaire.
- Using the equation (Cronbach's alpha) to check the stability of the tool.
- Using means and standard deviations to answer the first and third questions.
- Using the T-test for two independent samples to answer the second question.

### Findings

To answer the first question: What is the Efficiency Degree of Emergency Digital Teaching during Covid-19 Pandemic on Achieving Students' Quality Learning Outcomes from the point of view of the study sample? The arithmetic averages and standard deviations of the items of the first dimension were extracted, which dealt with indicators of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes, and as stated in the analysis of the first-dimension data, as shown in Table two:

Table 2. *Arithmetic averages and standard deviations of the first-dimension items*

	Dimension Items	Ar. M	SDV	Ef.
1	Emergency digital teaching developed students' technical skills.	4.25	0.83	H
2	Emergency digital teaching contributed to the development of the student's ability to find solutions to the problems arising from his use of information technology.	3.92	0.98	H
3	Emergency digital teaching developed the student's responsibility for self-learning.	3.86	0.92	H
4	Emergency digital teaching contributed to breaking the psychological barriers that reduced student participation and interaction in the lecture.	3.58	0.98	M
5	Emergency digital teaching encouraged effective communication between learning group members.	3.44	1.01	C
6	Emergency digital teaching developed students' verbal-verbal communication skills.	3.44	1.07	M
7	Emergency digital teaching enabled the student to acquire problem-solving skill.	3.39	1.09	M
8	Emergency digital teaching made it easier for students to memorize and retrieve knowledge.	3.33	1.13	M
9	Emergency digital teaching enabled the student to acquire critical thinking skill.	3.33	1.06	M
10	Emergency digital teaching developed students' verbal and written communication skills.	3.31	1.00	M
11	Emergency digital teaching made it easier for the student to understand the knowledge contained in the courses.	3.22	1.08	M
12	Emergency digital teaching contributed to the emergence of positive values among students such as teamwork and constructive cooperation.	3.22	0.95	M
13	Emergency digital teaching enabled the student to acquire investigation skill.	3.19	0.97	M
14	Emergency digital teaching encouraged students to engage in teamwork.	3.19	1.27	M
15	Emergency digital teaching contributed to increasing students' interaction with the teacher in the lecture.	3.17	1.17	M
16	Emergency digital teaching enabled the student to acquire the skill of analysis and conclusion.	3.11	1.08	M
17	Emergency digital teaching enabled the student to acquire the skill of innovative thinking	3.06	1.03	M
1	Average	3.41		M

By looking at Table two, it is clear that the total arithmetic mean of the items of the first dimension of the questionnaire was average, which reflects the average Efficiency Degree of Emergency Digital Teaching during Covid-19 Pandemic on Achieving Students' Quality Learning Outcomes from the point of view of the study sample. then, it appears from the table that three items scored the highest averages: Emergency digital teaching developed the students' technical skills and their arithmetic average (4.25); and Emergency digital teaching contributed to developing the student's ability to find solutions to the problems arising from his use of information technology, and its arithmetic mean (3.92); and finally, emergency digital teaching developed from the student's tolerance for the responsibility of self-learning, and its arithmetic average was (3.86). The high averages of these three items are a clear indication of the impact of emergency digital teaching, which universities resorted to in developing students' technical skills and problem-solving skills. This coincides with the major goals of the National Qualifications Framework (NQF) ((ETEC), 2020a), which emphasizes skills as a major component of the graduate's personality regardless of his specialization. Also, this result may be attributed to the nature of the challenge faced by students and their professors with the onset of the Covid-19 crisis, as everyone who had low technical skills encountered problems in dealing with the courses presented via electronic platforms. This is what prompted them to develop their skills. These results coincide with the results of studies number (Ouyaba, 2020; Gonzalez et al., 2022; Firmansyah et al., 2021; Ejdyś & Kozłowska, 2021).

As for the remaining items of the dimension, the averages ranged between 3.06 and 3.58, all of which reflect a medium efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes from the point of view of the study sample. Three of the highest items were of particular importance, as they affect high learning outcomes, and these items ranked fourth and fifth, namely: emergency digital teaching contributed to breaking the psychological barriers that reduced student participation and interaction in the traditional lecture, and their average was 3.58; and the item: Emergency digital teaching encouraged effective communication between learning group members, with a mean of 3.44, and the item: emergency digital teaching have developed verbal communication skills for the student, with a mean of 3.44. This result reflects the role of active participation and the teacher's involvement in practical experiences, and these results met with the results of (Bahanshal & Khan, 2021).

When they measure the students learning outcomes in university courses, experts in evaluating education realize that some of them were not tangible before the application of the education forms imposed by the Covid-19 Pandemic, especially in some outcomes related to communication skills, communication and information technology. Through his experience for more than ten years as a consultant in evaluating education, quality and academic accreditation, the researcher realized the difference represented in breaking the psychological barriers of the student, which increased his participation and interaction from a distance with both his colleagues and the course professor. The result shown by the results of the dimension analysis may be attributed to this reason.

To answer the second question: Are there statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) between the study sample members in their estimation of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes due to the variables of gender, years of experience, specialization? The

second question has been answered through the necessary analyzes and by calculating the arithmetic averages of the sample responses according to the three variables, as follows:

### **Gender Variable**

There was a calculation of the arithmetic means and standard deviations of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes from the point of view of the study sample according to the variable of gender. The T-test for two independent samples was used. Table three shows the result of the test, and the null hypothesis states that: There are no statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) among the sample members in their estimation of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes from the point of view of the study sample, this result is attributed to the variable of sex.

Table 3. *Arithmetic averages of the answers of the sample members according to the variable of sex*

Gender	Count	Arithmetic Means	Std.v	Value	Sig.
Male	320	57.78	13.11	-1.03	0.304
Female	40	60.00	10.55		

Looking at the test results as shown in Table three, it becomes clear that the differences are not statistically significant, which means that the null hypothesis is correct, and therefore there are no statistically significant differences attributable to the sex variable at the significance level ( $\alpha \leq 0.05$ ) among the sample members in their estimation of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes due to the variable of sex. This result opposes that of (Gonzalez et al., 2022), whose results showed differences in favor of females.

### **Years of Experience Variable**

The necessary analyses were conducted to extract the arithmetic means and standard deviations of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes based on the variable of years of experience. The t-test for two independent samples was used, and table four shows the test result, and the null hypothesis states that: There are no statistically significant differences at the significance level ( $\alpha \leq 0.05$ ) attributed to the variable of years of experience.

Table 4. *Arithmetic averages of the answers of the sample members according to the years of experience variable*

Years of Experience	Count	Arithmetic Average	Standard Deviation	Value	Sig.
Less than 10 Years	26	60.27	13.14	5.55	0.00
More than 10 Years	100	52.00	10.02		

From the test results shown in Table four, it is clear that the differences are statistically significant, which means that the null hypothesis is invalid. Therefore, there are statistically significant differences attributed to the years of experience variable at the significance level ( $\alpha \leq 0.05$ ) among the sample members in their estimation of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes. It appears from the table that it was in favor of those with years of experience less than ten years. This result may be attributed to the level of students dealt with by those with less experience. They dealt with undergraduate students, while those with long experience often dealt with graduate studies (Masters and PhDs). Their teaching burden was usually more than those with long experience who were often full professors and their teaching hours were fewer.

### ***Specialization Variable***

The necessary analyzes were conducted to extract the arithmetic averages and standard deviations of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes due to the specialization variable. The results are shown in Table five.

Table 5. *Arithmetic averages of the sample members' answers according to the specialization variable*

Specialization	Count	Arithmetic Average	Standard Deviation	Value	Sig.
Humanities	40	57.5	14.49	-275	0.783
Scientific	320	58.09	12.66		

By looking at the test results shown in Table five, it becomes clear that the differences are not statistically significant. This means that there are no statistically significant differences attributable to the variable of specialization at the significance level ( $\alpha \leq 0.05$ ) among the sample members in their assessment of the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes. This result can emerge from the fact that faculty members in humanities, like their colleagues in scientific faculties, use the same e-learning platforms and technologies and whatever was made available by the Ministry of Education in the KSA, the direct authority for education that manages its Corona file during the Pandemic. This result confirms the results of (Gonzalez et al., 2022).

To answer the third question: What are the factors that affected the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes? The arithmetic averages and standard deviations of the items of the second dimension were extracted from the questionnaire, which dealt with these factors, and they are shown in Table six.

Table 6. *Arithmetic averages and standard deviations of the second-dimension items*

No	dimension items	Arithmetic means	Standard Deviation	Efficiency
1	The difficulty of achieving some educational activities through technologies and their spaces.	4	0.85	High

2	Students' weak motivation towards learning during the Covid-19 Pandemic	3.78	0.85	High
3	Weak technical skills of some faculty members.	3.69	0.91	Medium
4	Poor technical skills of students.	3.64	0.98	Medium
5	Weak technical support services in case of problems in distance education system.	3.64	1.01	Medium
6	Weak technical infrastructure in universities.	3.58	1.09	Medium
	Overall Average	3.72		High

By looking at Table six, it is clear that the overall arithmetic means of the items of the second dimension of the questionnaire was high, which reflects the strong influence of some factors on the efficiency degree of emergency digital teaching on achieving of students' quality learning outcomes in Saudi universities during the Covid-19 Pandemic. These factors have limited the degree of achievement of learning outcomes for students. Moreover, the table shows that the highest averages were for the item "the difficulty of achieving some educational activities through technologies and their spaces", which received an average of 4.00, followed by the item "weak students' motivation towards learning during the pandemic" with an average of 3.78. The item "Weak technical skills of some faculty members" scored an average of 3.69. This indicates the importance of these factors and their substantial impact on the educational process imposed by the Covid-19 pandemic. This result is attributed to the nature of the stage in which traditional education alternatives were applied, such as emergency digital teaching or distance education or synchronous and asynchronous e-learning. There was no prior preparation in terms of students' required technical skills or psychological readiness. These results are consistent with the results of the studies of (Sayyaf, 2021; Ferri et al., 2020).

Perhaps this pandemic has opened the eyes and the mind to the urgent need to pay attention to distance education technological requirements to ensure the continuity of learning for students in emergency conditions and at all times and circumstances. The arithmetic averages of the fifth and sixth items in this dimension, which are related to the infrastructure of technological alternatives in universities and related technical support services, indicate how these factors affect students' learning outcomes and quality. This result is consistent with what was suggested by the studies of (Ferri et al., 2020; Firmansyah et al., 2021).

## Conclusion

More than a decade ago, the Saudi Ministry of Education set significant learning outcomes and included them in the National Qualifications Framework (NQF) (ETEC, 2020b). These outcomes are the basis for all procedures for designing academic programs and courses, and they have become a basis for the evaluation and development processes. They are today the focus of all quality and academic accreditation processes. This study highlighted and utilized them when building its tool and directing the course of its research. The study results showed the efficiency of emergency digital teaching, which Saudi universities resorted to for enhancing students' technical skills and problem-solving skills. This meets some of the primary goals of the National Qualifications Framework (NQF, 2020), which emphasizes these skills as a significant component

of the graduate's personality regardless of specialty. The study results showed that emergency digital teaching had an impact on developing some positive values among students, such as taking responsibility for self-learning and striving to solve problems arising from the use of technology. Emergency digital teaching contributed to breaking the psychological barriers that reduced student participation and interaction in the lecture.

But it was a minor degree in achieving learning outcomes in the knowledge and understanding domain. It was also a minor degree in achieving learning outcomes in the cognitive skills domain such as investigation, reasoning, creative thinking and critical thinking, which requires good planning and preparation for the use of technology in teaching. The study results also showed a set of factors that affected the achievement of the learning outcomes during the Covid-19 pandemic. These factors included the difficulty in executing some educational activities via the Internet and its spaces and the weak technical skills of students and some faculty members. The study also showed Saudi universities' general lack of readiness for modern education forms that use technologies. Perhaps this pandemic opened the eyes and raised the awareness of the need for distance educational technologies to ensure the continuity of learning for students, not only in emergency conditions but at all times and circumstances.

The limitation of the study includes objective limits, which means that the current study is limited to measuring the efficiency degree of emergency digital teaching during covid-19 pandemic on achieving students' quality learning outcomes. It also includes spatial limits, which refers to the fact that the tool was applied to the Saudi universities in the Riyadh region, which constitute 30% of Saudi universities. The last one is time limits since the study tool was applied to the study sample in the first semester of the 2021/2022 school year.

### Recommendations

In light of the results of the study, the following suggestions can be made as executive recommendations:

1. Universities should reconsider their planning and use of educational patterns to include modern education forms, such as e-learning, distance education, and blended learning so that teachers and students become ready for these patterns and requirements to achieve the desired quality of education and its outcomes.
2. Universities should focus on developing the technical skills of both faculty members and students through training programs that enhance those skills in line with the global trend towards distance education and e-learning.
3. The Ministry of Education should reconsider its strategies for planning higher education and its outcomes.
4. The Education and Training Evaluation Commission should include in the academic accreditation criteria for programs indicators specific to technological environments that meet the requirements of non-traditional education patterns and indicators for the technical skills of faculty members in universities.
5. Researchers can conduct further studies on non-traditional education forms (modern education forms) and their requirements to achieve the desired quality of education and its outcomes

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