Analysing lecturers' perceptions on traditional vs. distance learning: A conceptual study of emergency transferring to distance learning during COVID-19 pandemic

Mohd Khaled Yousef Shambour¹ · Muhannad A. Abu-Hashem²

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Abstract

In recent years, and also due to the COVID-19 pandemic, education institutions worldwide have changed their education paradigm from a traditional to an online system. These institutions have rapidly accomplished their educational programs and activities by supporting various web applications, allowing the completion of the education process remotely. This motivated us to investigate the general perceptions of the faculty members who are teaching different courses for undergraduate students using the distance education system. The proposed technique is based on the use of advanced analysis methods to test the hypothesis of instructors' perceptions of online teaching effectiveness, compared with traditional teaching, will not be affected by the following eight factors, including gender, academic major, age, academic degree, country of teaching, teaching experience in traditional classes, teaching experience in virtual classes (VCs), and whether or not the department/faculty provided e-learning courses before the COVID-19 pandemic. A total of 187 lecturers from 71 departments in 24 educational institutions located in 11 countries participated in this research. Results indicate that the perceptions of instructors regarding the online teaching system generally do not change based on the studied factors. Furthermore, the quantitative analyses illustrate that no significant differences exist in all dimension scales in terms of gender, major specification, age, country of teaching, and virtual experience. Significant differences are found in the dimension scale of distance education effectiveness in terms of academic degree and the educator status in terms of supporting VCs and traditional experience dimension scales. Additionally, the study provides various recommendations, including that the departments should encourage instructors to positively adapt with online teaching by developing the required skills and knowledge. Moreover, departments and institutions should support the teaching staff with specialized education tools. In addition, instructors should strive to decrease the communication and interaction gap between distance education and traditional in-class teaching.

Keywords COVID-19 · Education institution · Data analysis · Web applications · Teachers' perceptions · Online courses

1 Introduction

Distance learning has been used before the emergence of personal computers and the Internet, but the spread of personal computers and the availability of the Internet have contributed significantly to the wide reach of distance learning Uhlig (2002). Online learning has rapidly grown, especially in the last decade Willett et al. (2019). This growth entails the merging of online learning into educational systems as part of the formal educational process Al-Shboul (2013) and Nelson (2003).

Recently, a new type of coronavirus, called COVID-19, surfaced in China, and initial reports of its spread began in mid-December 2019 in Wuhan City [1]. Since then, cases of COVID-19 infections have increased rapidly worldwide, causing massive death rates. Consequently, this has led to the implementation of strict measures by national governments to prevent its spread, including the isolation of cities, travel restrictions from one city to another, and the closure of airports, malls, restaurants, shops, and educational facilities. The pandemic has also significantly affected many research projects and studies Shambour and Gutub (2021). Nevertheless, education programs have continued in many countries without the need for physical meetings between lecturers and students through the provision of courses via remote platforms and virtual learning environments, such as Blackboard [2], Moodle [3], Webex [4], Canvas [5], and so on. The main challenge facing educators today is primarily how to effectively manage and deliver educational services and curricula to stakeholders, the education community, and the marketplace Okoye et al. (2021). Some educational institutions have faced many challenges in transferring the entire learning process from traditional to virtual classrooms, especially those who have no experience in providing online courses. However, online courses must maintain and enhance the teaching quality to ensure the educational performance of students Hsiao (2021).

Fundamentally, 187 university lecturers of various disciplines and teaching experiences participated in the current study. The perceptions of lecturers who used the traditional and online systems during their teaching processes were examined and analyzed on the basis of three scales: distance education effectiveness, distance education compared to traditional education, and educator status. This study mainly aims to explore the influences of several factors on teachers' perspectives and explore the differences in lecturers' views toward teaching courses in traditional and online systems.

The paper is organized as follows. Section 2 provides some related works for the traditional and online teaching paradigms. Section 3 presents the methodology. Section 4 discusses the data analysis and results. Finally, Sect. 5 concludes the paper and provides recommendations for future work.

2 Related literature

Several studies have discussed the effects of learning effectiveness in traditional and virtual classrooms. Some of them pointed out the benefits of effective learning through traditional classrooms (Arias et al., 2018;), some have praised the effectiveness of virtual classroom teaching (Liu, 2010; Narayan & Singh, 2020; Trakru & Jha, 2019), and others have recommended the use of a hybrid approach (Khatri et al., 2013). Lecturers play a crucial role in the learning process and they strive to deliver the knowledge to students, especially in remote teaching. Thus, teachers' perceptions about distance education must be studied and identified to provide recommendations for the development and improvement of the quality of the educational process.

Furthermore many studies in literature have measured lecturers' preferences and performances in online and traditional face-to-face learning systems, including Shachar and Neumann (2003), Bernard et al. (2004), Allen et al. (2002), Sitzmann et al. (2006), Hurlbut (2018), Yerby and Floyd (2013), Hannay and Newvine (2006), and Sibirskaya et al. (2019). Other studies discussed the advantages and disadvantages of using both systems, such as in Behzadi and Ghaffari (2011), Gowda and Suma (2017), and Lazou and Tsinakos (2019).

Saleh and Mrayan (2016) examined the Arab Open University in Jordan as a case study on faculty perceptions of online education programs. They examined the faculty's perceived values of online learning effectiveness, the interaction between the teacher and student, the adequacy of the provided technology by the institute, the teaching techniques used, and the performances of students. They reported that the faculty members are generally satisfied with online education despite that they favored face-to-face and blended courses in teacher training programs.

To improve the distance education system, Güreter et al. (2016) examined the opinions of instructors who have experienced online teaching. They interviewed 12 instructors to produce some suggestions that can contribute to online learning enhancement. The study presents the positive and negative sides of online learning from the perspectives of the interviewed instructors. Meanwhile, Shreaves (2019) conducted a study on faculty perceptions of online teaching at the Pacific Lutheran University to highlight the factors that encourage and discourage online education application. The main goal of the study is to encourage and motivate the employment of online learning in Pacific Lutheran University. To provide a theoretical lens to examine the influence of attitudes, subjective norms, and perceived behavioral control, the decomposed theory of planned behavior (DTPB) is applied, and 50% of the respondents highlighted 17 factors that influence the decision on whether or not to teach online.

Samuel (2016) conducted a study on the “presence” or the false impression of being in an actual classroom within an online learning environment. The goal of that study was to investigate and examine how the faculties who applied online courses perceive and experience presence. In addition, many studies targeted instructors' perceptions of best practices and quality outcomes Frazer et al. (2017), Plante and Asselin (2014), and Richardson et al. (2016). Frazer et al. (2017), for example,

conducted a study on faculty perceptions of online teaching of nursing online education. The goal of their study was to characterize and express teaching effectiveness and quality indicators in an online environment, which did not require instructors and students to be online simultaneously. Eleven instructors were interviewed to achieve that goal. The study concluded by suggesting some useful practices that can support online education.

Meanwhile, a study that measured faculty members' perceptual differences in terms of distance education was conducted by Ulmer et al. (2007). However, it did not consider actual learning outcomes and the quality of distance education as part of the measurement. The findings of the study indicated that some degree of distance education effectiveness might be helpful if it is considered by higher education culture. A literature exploration during the time period of 1995–2015 was conducted by Wingo et al. (2017) to investigate faculty perceptions related to online teaching. They analyzed 67 studies to achieve that goal. The investigation revealed issues encountered by the faculty encounters in online teaching, such as student success, required technical support, work load, and others. McKenzie (2019) conducted a phenomenological study, which investigated instructor/student interaction during online courses and discussed various types of interactions along with some interaction obstacles. That study provided instructors and program administrators with useful and detailed descriptions of state-of-the art techniques of instructor/student online interaction.

Previous studies have analyzed and discussed lecturers' perception of online teaching and the effectiveness of online teaching in departments that used to support online teaching. In this study we aim to analyze and discuss lecturers' perception of online teaching in terms of emergence transfer from traditional in-class teaching to online teaching caused by the COVID-19 pandemic. Moreover, study analyzed the effectiveness of sudden transfer from traditional in-class teaching to online teaching during the COVID-19 pandemic.

3 Methodology

The section presents the methodology used in this paper, starting from reviewing the literature, defining research hypothesis, defining the research instrument, data analysis and discussion, and reporting of the results as shown in Fig. 1:

- Reviewing the Literature

A descriptive literature review was conducted in which the related works, main goal, methods, and results were generally discussed briefly as in the previous section. The main focus of the literature review was directed toward studies that targeted the experience of faculty members related to distance education programmers.

- Defining research hypothesis

An ANOVA statistical method, at alpha level of 0.05, is used to observe whether a significant difference exists between the results collected from lec-

Fig. 1 Research methodology

tureurs' perspectives of online teaching effectiveness compared with traditional teaching such that:

- The null hypothesis (H1) states that instructors' perception will not be affected by the factors of major, academic degree, country of teaching, age, teaching experience in traditional classes, teaching experience in virtual classes (VCs) and whether or not the department/faculty provided e-learning courses before the COVID-19 pandemic;
- The alternative hypothesis (H2) rejects the null one.

- Defining the research instrument

To study the lecturers' point of view on distance learning effectiveness during COVID-19, a research instrument (questionnaire) adopted from Ulmer et al. (2007) was used to obtain lectures' experiences and observations. The questionnaire comprises three scales, namely, distance education effectiveness, distance education compared to traditional education, and educator status. Each scale has a number of questions, as shown in Table 1. The questionnaire was developed using a Likert-type scale with five-point responses ranging from 1 = strongly disagree to 5 = strongly agree.

- Data analysis and discussion

Similar to the data analysis performed by Okoye et al. (2021), this study applied statistical inference-basis of theoretical distributions to analyze the collected data and explore the descriptive features using ANOVA statistical method

Table 1 Questionnaire used to collect the data (Ulmer et al. (2007))

Scales	Variables
Scale 1. Distance education effectiveness	<p>1 Higher education students perform better in distance learning classes as compared with traditional learning classes</p> <p>2 Distance learning classes provide ample teacher-student interaction</p> <p>3 I believe distance learning improves the quality of education</p> <p>4 Distance education improves students' quantitative skills</p> <p>5 Distance learning provides a platform for students to master the fundamental objective of the courses</p> <p>6 Distance learning provides a platform to assess the educational effectiveness of the course</p> <p>7 Student interactivity is better developed in distance learning as opposed to traditional learning</p> <p>8 When compared to traditional learning, distance education provides students with a higher quality course material</p> <p>9 Distance education improves teachers' performance</p> <p>10 Distance education improves the students' performance</p> <p>11 Compared to conventional classroom courses distance learning courses are:</p> <p>12 My department will recognize my efforts in following instructions when using distance learning</p> <p>13 My department is committed to utilizing the distance learning as an education tool</p> <p>14 Faculty members at my college/university who use distance teaching gain more prestige than those who do not</p> <p>15 Faculty members at my college/university who use distance teaching hold a higher profile than those who do not</p> <p>16 My department colleagues consider the distance learning positively</p> <p>17 The involvement with distance learning efforts has a remarkable status in my college/university</p>
Scale 2. Distance to traditional	
Scale 3. Educator status	

that reveals the factors that cause differences in the mean between different groups and determines whether statistically significant differences exist between groups. These were then used to test the hypothesis to realize the relationships among different variables and explore the teaching effectiveness on the basis of instructors' perceptions on practice teaching within the traditional and virtual online systems.

- Reporting of the results

This is the final step wherein the results of the analyzed data are discussed and presented so that the findings can provide valuable insights to researchers with varying interests and expertise. The authors declare that they had obtained an ethical approval from the Department of Information and Scientific Services at the Custodian of the Two Holy Mosques Institute for Hajj and Umrah Research, Umm Al-Qura University, Saudi Arabia.

4 Data analysis and results

4.1 Demographic data

The sample data were collected toward the end of the fall semester (May 27–31, 2020). A total of 187 lecturers were randomly selected to participate in this study, in which 70.9% were males and 29.1% were females, from 71 departments belonging to 24 educational institutions located in 11 countries.

The collected sample data were categorized to eight major factors: gender, participation based on general specialization, academic degree, country of teaching, age, teaching experience in traditional classes, teaching experience in VCs, and whether or not the department/faculty provided e-learning courses before the COVID-19 pandemic. The main idea behind these categorizations was to target the differences in opinions on the basis of different aspects.

Figure 2 shows the number of survey respondents in terms of general specialization. It also shows the percentage of participants in each category. Similar to a study conducted by Affounh and Raba (2018), this study focuses several general specializations, including computer science and information technology (IT), medical/health sciences, social and human sciences, applied sciences, engineering sciences, and Sharia sciences. The majority of responses came from computer science and IT with 26% and medical/health sciences with 25% of the responses, respectively, which are in line with the results of Affounh and Raba (2018).

Figure 3 provides the percentages of participants in terms of academic degree. Similar results were found in a study by Alshalawi (2019), which found that the majority of participants were associate professors (37%), followed by associate professors and lecturers (22% each). Moreover, the percentages of participants in terms of country of teaching are given in Fig. 4, where the responses came from Jordan (48.1%), Saudi Arabia (31%), Palestine (10.7%), Egypt (3.2%), Oman (1.6%),

Fig. 2 Distribution of participants based on general specialization

Malaysia (1.6%), and others—Tunisia, United Arab Emirates, Australia, United Kingdom, and—Sudan(3.7%). Figure 5 shows the percentages of participants' ages. The majority of participants were between 30–40 (32.6%) and 41–50 years (29.9%).

A comparison between participants' teaching experience in traditional and VCs is shown in Fig. 6. The figure reveals that the majority of participants have higher experience in traditional classes compared with their experience in VCs in all experience years except for 'less than a year.' The main reason behind this is the sudden decision made because of the COVID-19 pandemic wherein instructors are required to continue teaching their courses online.

Fig. 3 Distribution of participants based on academic degree

Fig. 4 Distribution of participants based on participants' country of teaching

Figure 7 illustrates whether or not the department/faculty has provided e-learning courses before the COVID-19 pandemic. The answers showed that almost two-thirds of the responses were positive at 67.9%.

4.2 Data analysis and discussion

ANOVA test was applied to evaluate the instructors' perceptions of online teaching effectiveness compared to traditional teaching. Table 2 shows the ANOVA test results for instructors' perceptions of online teaching effectiveness compared to traditional teaching in terms of gender.

The quantitative analyses show that the average response ratings did not exceed the neutrality on any of the dimensional measures across all eight factors. This indicates that instructors are unable to decide whether online teaching is more effective

Fig. 5 Distribution of participants based on participants' ages

Fig. 6 Distribution of participants based on their teaching experiences in traditional and online classes

Fig. 7 Department/college provides e-learning courses before the COVID-19 pandemic (yes, no)

Table 2 ANOVA test results for dimension scales based on gender

Dimension Scales	Gender	N	Mean	Std	F_value	P_value
Distance education effectiveness	Male	127	2.55	0.79	0.003	0.95
	Female	60	2.56	0.75		
Distance education vs. traditional education	Male	127	2.76	0.78	0.36	0.55
	Female	60	2.84	0.78		
Educator status	Male	127	3.29	0.73	0.76	0.38
	Female	60	3.39	0.62		

Table 3 ANOVA test results for dimension scales based on academic major

Dimension Scales	Major	N	Mean	Std	F_value	P_value
Distance education effectiveness	Social and Human Sciences	37	2.47	0.81	0.62	0.71
	Computer science and IT	49	2.56	0.69		
	Medical Sciences/Health	47	2.48	0.78		
	Applied Sciences	29	2.59	0.90		
	Engineering Sciences	10	2.80	0.62		
	Islamic Sciences	4	2.82	1.54		
	Others	11	2.83	0.53		
Distance education vs. traditional education	Social and Human Sciences	37	2.72	0.85	0.48	0.83
	Computer science and IT	49	2.86	0.66		
	Medical Sciences/Health	47	2.71	0.84		
	Applied Sciences	29	2.76	0.78		
	Engineering Sciences	10	2.80	0.75		
	Islamic Sciences	4	3.06	1.30		
	Others	11	3.05	0.79		
Educator status	Social and Human Sciences	37	3.43	0.79	1.09	0.37
	Computer science and IT	49	3.27	0.75		
	Medical Sciences/Health	47	3.29	0.72		
	Applied Sciences	29	3.25	0.60		
	Engineering Sciences	10	3.23	0.27		
	Islamic Sciences	4	4.08	0.75		
	Others	11	3.41	0.57		

than traditional teaching. This uncertainty comes as a result of instructors' experience in online teaching where 71.7% of participants have experience of less than a year, indicating that they start online teaching because of the COVID-19 pandemic taking into consideration that the survey was conducted in June 2020.

As shown in Table 2, the P value in all dimension scales is greater than 0.05, indicating that no significant differences exist in instructors' perceptions in terms of gender meaning that instructors' perceptions of online teaching effectiveness—as compared to traditional teaching—do not contrast by instructors' gender, which supports our hypothesis (h_1) and in contrast to the results observed by Seok et al. (2010) who showed that female instructors have statistically significant higher perceptions than males regarding the effectiveness of the online course.

Moreover, the mean results in every dimension scale show that both gender responses are closer to neutral than disagree on distance education effectiveness and distance education vs. traditional education dimension scales, and closer to neutral than agreement for educator status dimension scale. This indicates that instructors are unable to decide whether online teaching is more effective than traditional teaching or not. In addition, instructors' perceptions of variable 17 from the questionnaire show that instructors of both genders state that their efforts are well recognized and appreciated by the department /college /university.

Table 4 ANOVA test results for dimension scales based on age

Dimension Scales	Age	N	Mean	Std	F_value	P_value
Distance education effectiveness	Less than 30	2	3.21	1.31	1.05	0.38
	30–40	56	2.52	0.71		
	41–50	61	2.59	0.80		
	51–60	33	2.39	0.64		
	More than 60	35	2.69	0.94		
Distance education vs. traditional education	Less than 30	2	3.13	1.59	0.92	0.46
	30–40	56	2.71	0.74		
	41–50	61	2.90	0.74		
	51–60	33	2.64	0.75		
	More than 60	35	2.86	0.91		
Educator status	Less than 30	2	3.83	0.47	1.35	0.25
	30–40	56	3.26	0.57		
	41–50	61	3.32	0.73		
	51–60	33	3.21	0.67		
	More than 60	35	3.53	0.85		

Table 3 shows the ANOVA test results for instructors' perception of online teaching effectiveness compared to traditional teaching in terms of major. As shown in Table 3, the P value in all dimension scales is greater than 0.05, indicating that no significant differences exist in instructors' perceptions in terms of major meaning that instructors' perceptions of online teaching effectiveness—compared with traditional teaching—do not contrast by instructors' major, which supports our hypothesis (h_1). This is not in line with the findings observed by Alshangeeti et al. (2009), which found that a significant relationship exists between instructors' professional specialization and their perceptions regarding the attributes of online teaching.

The results show that the mean instructors' responses of the distance education effectiveness dimension scale are closer to neutral than disagree stating that, from instructors point of view, students' skills, knowledge, and interactions with instructors from various majors are not improved by transferring to distance education. Moreover, the mean results of the distance education vs. traditional education dimension scale show that responses are closer to neutral than disagree for instructors in social and human sciences, computer science and IT, medical sciences/health, applied sciences, and engineering sciences majors, whereas instructors in Islamic sciences major and other majors are closer to neutral than agree. This concludes that instructors in Islamic sciences major have slightly more positive opinions toward transferring to online teaching.

Finally, the mean results of the educator status dimension scale show that the responses are closer to neutral than agree except those in the Islamic sciences major who are closer to agree than strongly agree. Meaning that instructors in the Islamic sciences major receive more positive encouragements toward adapting distance education than other majors.

Table 5 ANOVA test results for dimension scales based on country

Dimension Scales	Country	N	Mean	Std	F_value	P_value
Distance education effectiveness	Egypt	6	2.31	0.31	1.74	0.12
	Jordan	90	2.61	0.78		
	Malaysia	3	2.57	1.00		
	Oman	3	1.81	0.86		
	Palestine	20	2.84	0.66		
	Saudi Arabia	58	2.41	0.81		
	Others	7	2.96	0.75		
Distance education vs. traditional education	Egypt	6	2.67	0.30	1.37	0.23
	Jordan	90	2.84	0.79		
	Malaysia	3	2.75	1.39		
	Oman	3	2.50	1.09		
	Palestine	20	3.01	0.69		
	Saudi Arabia	58	2.62	0.80		
	Others	7	3.29	0.53		
Educator status	Egypt	6	3.42	0.35	1.81	0.10
	Jordan	90	3.36	0.72		
	Malaysia	3	3.06	0.63		
	Oman	3	2.61	0.92		
	Palestine	20	3.65	0.54		
	Saudi Arabia	58	3.19	0.73		
	Others	7	3.45	0.55		

Table 4 shows the ANOVA test results for instructors' perceptions of online teaching effectiveness compared to traditional teaching in terms of age.

As shown in Table 4, the P value in all dimension scales is greater than 0.05 indicating that no significant differences exist in instructors' perceptions in terms of age meaning that instructors' perceptions of online teaching effectiveness—compared with traditional teaching—do not contrast by instructors' age, which supports our hypothesis (h_1), which agreed with the results obtained by Alshangeeti et al. (2009).

Furthermore, based on the mean results of the distance education effectiveness dimension scale, responses in all ages are closer to neutral than disagree except ages that less than 30 and ages from 51 to 60, who are closer to neutral than agree and closer to disagree than neutral, respectively. This concludes that younger instructors perceive distance education more positively than elder instructors. Moreover, the mean results of the distance education vs. traditional dimension scale show that responses in all ages are closer to neutral than disagree except the ages that less than 30, who are closer to neutral than agree, indicating that younger instructors find distance education promising and full of potentials. Finally, the mean results of the educator status dimension scale show that responses in all ages are closer to neutral than agree except the ages that less than 30 and greater than 60, who are closer to agree than neutral, indicating that most younger and most elder instructors

Table 6 ANOVA test results for dimension scales based on academic degree

Dimension Scales	Degree	N	Mean	Std	F_value	P_value
Distance education effectiveness	Professor	24	2.38	0.68	2.75	0.03
	Associate professor	41	2.60	0.85		
	Assistant Professor	70	2.40	0.70		
	Lecturer	41	2.77	0.82		
	Teaching Assistant	11	2.99	0.84		
Distance education vs. traditional education	Professor	24	2.69	0.89	1.32	0.26
	Associate professor	41	2.87	0.72		
	Assistant Professor	70	2.66	0.69		
	Lecturer	41	2.92	0.89		
	Teaching Assistant	11	3.09	0.87		
Educator status	Professor	24	3.29	0.80	1.81	0.13
	Associate professor	41	3.18	0.69		
	Assistant Professor	70	3.27	0.68		
	Lecturer	41	3.57	0.73		
	Teaching Assistant	11	3.38	0.44		

find distance education prestigious and obtain more positive encouragements toward moving to distance education than others.

Table 5 shows the ANOVA test results for instructors' perceptions of online teaching effectiveness compared to traditional teaching in terms of country of teaching.

As shown in Table 5, P values are greater than 0.05 for all dimension scales, indicating that no significant differences exist in instructors' perceptions in terms of country of teaching meaning that instructors' perceptions of online teaching effectiveness—compared with traditional teaching—do not contrast by instructors' country of teaching, which supports our hypothesis (h_1). These results are inconsistent with the results of Alenezi (2012) who stated that lecturer's perceptions of e-learning were influenced by their nationality.

Furthermore, based on to the mean results of the distance education effectiveness dimension scale, responses from all countries are closer to neutral than disagree except responses from Egypt, Saudi Arabia, and Oman, which are closer to disagree than neutral. Meaning that instructors from Egypt, Saudi Arabia, and Oman favor conventional in-class teaching over online teaching. Moreover, the mean results of the distance to the traditional dimension scale show that responses from all countries are closer to neutral than disagree except responses from Palestine and others, which are closer to neutral than agree. This indicates that Palestinian instructors have slightly more positive opinions toward distance education. Finally, the mean results of educator status dimension scale show that responses from all countries are close to neutral, except those from Palestine, which are close to agree, indicating that Palestinian instructors obtain more encouragements toward moving to distance education.

Table 7 ANOVA test results for dimension scales based on supporting VC

Dimension Scales	Supporting VC	N	Mean	Std	F_value	P_value
Distance education effectiveness	Yes	127	2.63	0.81	3.615	0.059
	No	60	2.40	0.69		
Distance education vs. traditional education	Yes	127	2.83	0.78	0.714	0.399
	No	60	2.72	0.79		
Educator status	Yes	127	3.41	0.69	6.051	0.015
	No	60	3.14	0.71		

Table 6 shows the ANOVA test results for instructors' perceptions of online teaching effectiveness compared to traditional teaching in terms of degree/rank.

As shown in Table 6, a significant difference is detected in instructors' perceptions on the basis of academic degree for distance education effectiveness dimension scale, which contradict with the study's hypothesis (h_1). Meanwhile, the study's hypothesis (h_1) holds in the other two scales. This agreed with the results obtained by Alshangeeti et al. (2009), which reported that no evidence exists for any relationship between educational level and perceptions of online teaching attributes.

Moreover, based on to the mean results of the distance education effectiveness dimension scale, instructors' opinions of associate professors, lecturers, and teaching assistants are closer to neutral than disagree, whereas the responses of professors and assistant professors are closer to disagree than neutral. These values indicate that professors and assistant professors favor conventional in-class teaching over online teaching. Furthermore, the mean results of the distance education vs. traditional dimension scale show that responses are closer to neutral than disagree except teaching assistants, who are closer to neutral than agree, indicating that lecturers have slightly more positive opinions toward distance education. Finally, the mean results of the educator status dimension scale show that the responses from all academic degrees are closer to neutral than agree except those from lecturers, which are closer to agree than neutral, indicating that lecturers are more motivated than other instructors.

Table 7 shows the ANOVA test results for instructors' perceptions of online teaching effectiveness compared to traditional teaching in terms of supporting VCs.

As shown in Table 7, a significant difference is detected in instructors' perceptions on the basis of whether or not the departments used to support VCs for educator status dimension scale, which contradict with the study's hypothesis (h_1). Meanwhile, the study's hypothesis (h_1) holds in the other two scales.

Furthermore, based on the mean results of the distance education effectiveness dimension scale, the responses of participants in departments that support VCs are closer to neutral than disagree, whereas the responses of participants in departments that do not support VCs are closer to disagree than neutral. The responses indicate that instructors working in departments that suffer from lack of experience in VCs find traditional in-class teaching better than distance education. Moreover, the mean

Table 8 ANOVA test results for dimension scales based on traditional experience

Dimension Scales	Traditional experience	N	Mean	Std	F_value	P_value
Distance education effectiveness	Less than a year	14	3.00	0.80	2.03	0.11
	1–5	38	2.58	0.83		
	6–10	39	2.61	0.85		
	More than 10 years	96	2.47	0.72		
Distance education vs. traditional education	Less than a year	14	3.20	0.79	2.29	0.08
	1–5	38	2.74	0.72		
	6–10	39	2.94	0.76		
	More than 10 years	96	2.69	0.80		
Educator status	Less than a year	14	3.81	0.62	3.32	0.02
	1–5	38	3.38	0.76		
	6–10	39	3.14	0.62		
	More than 10 years	96	3.31	0.70		

results of the distance education vs. traditional dimension scale show that participants' responses are closer to neutral than disagree, indicating that participants from both are unable to decide which teaching mechanism is better. Meanwhile, the mean results of the educator status dimension scale show that participants' responses are closer to neutral than agree, indicating that the instructors who work in departments used to support VCs think positively and enthusiastically toward online teaching.

Table 8 shows the ANOVA test results for instructors' perceptions of online teaching effectiveness compared to traditional teaching in terms of traditional teaching experience.

As shown in Table 8, a significant difference is detected in instructors' perceptions based on traditional teaching experience for educator status dimension scale, which contradicts with the study's hypothesis (h_1). Meanwhile, the study's hypothesis (h_1) holds in the other two scales, which agreed with the results obtained by Alshangeeti et al. (2009).

Furthermore, regarding the mean results of the distance education effectiveness dimension scale, all participants' responses are closer to neutral than disagree, except those with experience greater than 10 years, who are closer to disagree than neutral. This concludes that instructors with high experience in traditional teaching favor traditional teaching over online teaching. In addition, the mean results of the distance vs. traditional teaching dimension scale show that participants with traditional teaching experience of more than a year (92% of participants) are closer to neutral than disagree, whereas participants who have experience of less than a year (8% of participants) are closer to neutral than agree. Even though the responses are pointing toward undecided, instructors with less experience slightly tend to move from traditional teaching toward distance education. Finally, the mean results of the educator status dimension scale show that participants with traditional teaching experience of more than a year are closer to neutral than agree, whereas participants who have experience of less than a year are closer to agree than neutral, indicating that instructors with less experience

Table 9 ANOVA test results for dimension scales based on virtual experience

Dimension Scales	Virtual experience	N	Mean	Std	F_value	P_value
Distance education effectiveness	Less than a year	128	2.54	0.77	0.75	0.53
	1–5	37	2.64	0.76		
	6–10	9	2.81	0.85		
	More than 10 years	13	2.36	0.96		
Distance education vs. traditional education	Less than a year	128	2.74	0.77	1.23	0.30
	1–5	37	2.85	0.85		
	6–10	9	3.22	0.65		
	More than 10 years	13	2.87	0.79		
Educator status	Less than a year	128	3.30	0.67	0.86	0.46
	1–5	37	3.39	0.71		
	6–10	9	3.63	0.58		
	More than 10 years	13	3.21	1.04		

find distance education prestigious and obtain more encouragements from the department toward moving to online teaching than others.

Table 9 shows the ANOVA test results for instructors' perceptions of online teaching effectiveness compared to traditional teaching in terms of virtual teaching experience.

As shown in Table 9, P values are greater than 0.05 in all dimension scales, indicating that no significant differences exist in instructors' perceptions in terms of virtual teaching experience meaning that instructors' perceptions of online teaching effectiveness—compared with traditional teaching—do not contrast by instructors' virtual teaching experience, which supports our hypothesis (h_1) and contrasted with the results obtained by Ulmer et al. (2007).

Furthermore, based on the mean results of the distance education effectiveness dimension scale, responses from all participants are closer to neutral than disagree, except those with experience greater than 10 years, who are closer to disagree than neutral. Furthermore, instructors with more experience in VCs observe that students favor traditional in-class teaching over online teaching. Moreover, the mean results of the distance education vs. traditional education dimension scale show that all participants are closer to neutral than disagree, except those with experience of 6–10 years, who are closer to neutral than agree. Finally, the mean results of the educator status dimension scale show that the responses from all participants are closer to neutral than agree except those from participants with experiences of 6–10 years, which are closer to agree than neutral, indicating that instructors with more experience in VCs find distance education prestigious and obtain more positive encouragements toward moving to distance education than others.

Table 10 summarizes the P_value results for the five-dimension scales in all factors. In total, 12.5% of the P values' results show significant differences for instructors' perceptions of online teaching effectiveness compared with traditional in-class teaching (highlighted in bold), whereas 87.5% of P values' results do not show any significant differences.

Table 10 Summary table of P_Value results for the 5D scales in all factors

Dimension Scales Factors	Distance education effectiveness	Distance education vs. tradi- tional education	Educator status
Gender	0.95	0.55	0.38
Major	0.71	0.83	0.37
Age	0.38	0.46	0.25
Country	0.12	0.23	0.10
Academic degree	0.03	0.26	0.13
Supporting VC	0.059	0.399	0.015
Traditional experience	0.11	0.08	0.02
Virtual experience	0.53	0.30	0.46

5 Conclusion and future works

This study explores the perceptions of instructors on distance learning during the COVID-19 pandemic. 3D scales, namely, distance education effectiveness, distance education compared to traditional education, and educator status, are applied to analyze data on the perceptions of 187 instructors from various universities and academic degrees. The study explored the effects of eight factors on the instructors' perspectives, including major specifications, academic degree, country of teaching, age, teaching experience in traditional classes, teaching experience in VCs, and whether or not the department/faculty provided e-learning courses before the COVID-19 pandemic.

However, the findings of studying the teaching effectiveness of instructors' perceptions using traditional and virtual online teaching systems illustrate that no significant differences exist (87.5% of P values' results for all factors) in all dimension scales in terms of gender, major specification, age, country of teaching, and virtual experience. In comparison, significant differences (12.5% of P values' results for all factors) are found in the dimension scale of distance education effectiveness in terms of academic degree, the educator status of supporting VCs, and traditional experience. Moreover, the quantitative analyses show that the average response ratings did not exceed neutrality on any of the dimensional measures across all factors studied. Moreover, the dimension scale of educator status achieves the highest average score in all studied factors.

On the basis of the study, we find that: younger and less experience lecturers (less than a year) perceive distance education more positively and they are more motivated to transfer from traditional teaching to online teaching than other lecturers. Moreover, they feel that they receive more positive encouragements toward adapting distance education from their institutions than other lecturers. In addition, most of the participated lecturers feel that they are not motivated by their institutions to shift from traditional teaching to online teaching. Furthermore, lecturers and students lack awareness about the importance and advantages of distance education over traditional teaching.

On the basis of the findings, we recommend that: departments should strive toward encouraging and motivating teaching staff to transfer from traditional teaching to online teaching. Moreover, the departments must increase instructors' and students' awareness of online teaching importance and develop and improve their skills of how to utilize distance education.

Based on lecturer's responses, the unexpected shift from traditional teaching to online teaching during COVID19 pandemic negatively affects teaching and learning effectiveness. This depletion of teaching and learning effectiveness are caused by several factors including; lack of lecturer's experience in online teaching and lack of appropriate orientations and guidance for lecturers and students of online teaching importance, capabilities, and proper utilization.

Although the acceptance rate of online teaching is increasing especially among young and less experience lecturers, based on lecturer's responses, the majority of lecturers tend to resist transfer from traditional teaching toward online teaching. Thus, it can be concluded that institutions that used to apply traditional teaching before the COVID-19 pandemic will return to normal traditional teaching after the pandemic.

Future studies should focus on exploring the effects of other factors, which influence the lecturers' perceptions, using data mining tools that can assist researchers from diverse interests and expertise in their works.

Nomenclatures

P_value: Refers to a numeric quantity computed for sample statistics within the context of hypothesis testing; **F_value:** Refers to a value on the F distribution; **Std.:** Refers to the standard deviation

Abbreviations

COVID-19: Coronavirus disease 2019; **VCs:** Virtual Classes; **DTPB:** Decomposed Theory of Planned Behavior; **IT:** Information Technology; **ANOVA:** Analysis of Variance

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Authors and Affiliations

Mohd Khaled Yousef Shambour¹ · Muhannad A. Abu-Hashem²

✉ Mohd Khaled Yousef Shambour
myshambour@uqu.edu.sa

Muhannad A. Abu-Hashem
mabohasm@kau.edu.sa

¹ Department of Information and Scientific Services, the Custodian of the Two Holy Mosques Institute for Hajj and Umrah Research, Umm Al-Qura University, Makkah, Saudi Arabia

² Department of Geomatics, Architecture and Planning Faculty, King Abdulaziz University, Jeddah, Saudi Arabia