

Students' perception of emergency remote teaching in the Sultanate of Oman

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ABSTRACT

During the coronavirus disease 2019 (COVID-19) pandemic, educational institutions adopted emergency remote teaching (ERT) practices. In ERT, courses are taught online by teachers who have experience with face-to-face classroom instruction. Students and teaching staff were concerned about the sudden change to ERT and learning practices. Higher education institutions (HEIs) need to understand students' perceptions of ERT in order to prepare appropriate strategies for online teaching and learning. This study is intended: i) to analyze the students' perception of ERT and ii) to explore the factors that determine the effectiveness of ERT during pandemic periods. The researchers used an online survey method to collect the primary data by employing a structured questionnaire. They employed the purposive sampling technique for this study. The results of the study highlight the fact that students prefer to take advantage of the available learning opportunities during the pandemic period. This is because they can earn their academic qualifications on time. It is also evident that the sudden transition to online teaching did compromise the efficacy of academic delivery to a certain extent. The study also found that motivation and assessment were crucial factors in determining the effectiveness of ERT during the pandemic period.

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1. INTRODUCTION

COVID-19 has affected almost all countries. To minimize the spread of the virus, many countries have suspended face-to-face classes in schools and higher education institutions (HEIs) from April 2020. Educational institutions have adopted emergency remote teaching (ERT) practices to continue teaching and learning activities. HEIs utilize online learning platforms such as Microsoft Teams, Zoom, and Google Classrooms for remote teaching. However, many students and teaching staff had concerns about the sudden switch over to online learning platforms. The teaching staff, students, and parents were not keen on online learning at the beginning. Both teachers and students faced challenges like poor networks and the non-availability of digital devices, and so on [1]. Since the virus spread was unpredictable, there was no scope for planning, training, or creating the required technological infrastructure to implement remote learning on this large scale. So, it was not possible to develop a standardized procedure for implementing ERT [2].

The current situation demands the continuation of learning so that the students should not be affected in any way [3]. Remote learning was the only option to continue the learning process during the pandemic period. HEIs were able to continue teaching and learning activities in the new academic year due to the transition to online learning. In pursuance of implementing ERT, HEIs organized a series of training

programs for teachers and students to familiarize themselves with digital teaching platforms [4]. In addition, the online platform vendors introduced a couple of new features to make the online platforms user-friendly. Moreover, governments in many countries took various initiatives to support the continuation of online classes by providing guidelines and technology infrastructure. These supportive events enabled the HEIs to continue the live online classes.

ERT is certainly different from the full-fledged online learning system. The latter offers several benefits to the learners such as easy access to learning material, more peer interactions, flexible learning time, and cost-effectiveness [5]. This type of regular online learning provides unique opportunities and advantages to both teachers and students, and it is mostly suitable for adult education [6]. In fact, such benefits may not apply to online education that replaces face-to-face teaching due to the pandemic. In ERT, courses are taught online by teachers who are experienced in face-to-face classroom teaching skills. It requires learners and teachers to be online at the scheduled time for the live sessions. Therefore, it restricts the teachers and learners to have interactions during the scheduled class time. Moreover, developing countries face several challenges in online learning compared to developed countries due to poor internet access, insufficient awareness of information and communication technology (ICT) use, and deficiency in content creation [7].

There is growing interest and palpable positivity among students about e-learning. The use of e-learning is not new by any standards and was already in vogue in different academic programs. Combining technology in classroom teaching supports active learning and enhances learning experiences among students [8], [9]. Undoubtedly, integrating technology into teaching has the potential to improve teaching practices [10]. However, the skill of embedding ICT into face-to-face classroom teaching may not be sufficient to practice ERT. The pandemic forced us to rely on technology alone to continue teaching and learning activities [11]. Teaching and learning almost came to a grinding halt with the advent of coronavirus disease 2019 (COVID-19). The delay in the commencement or completion of the academic year aggravated the psychological distress among college students [10]. Therefore, the HEIs in various parts of the world replaced face-to-face classroom teaching with remote teaching and learning [12], [13]. This enabled the students to continue their routine learning activity remotely, which also helps them improve technological and generic skills.

Previous studies show that the students did not show interest in e-learning for a long time and preferred face-to-face learning [10], [14]. Online learning is thought to be inferior to face-to-face teaching in underdeveloped countries as access to the internet is limited due to technical and monetary reasons. Traditional face-to-face classes are considered more effective than online learning [10], [15]. Moreover, the quality of online teaching depends on the technical infrastructure, teaching staff competencies [6], and the study field. The existence of unreliable and unequal infrastructural facilities might further exacerbate the inequalities among learners [16].

Some studies show that students have developed a positive perception of e-learning during the pandemic period. For example, Menon *et al.* [17] identified that most students have positive responses to online classes and exhibited a high level of acceptance. The students felt that online classes are comfortable in the pandemic environment, which helps avoid travel and maintain social distancing. Another peculiar feature of online learning is the availability of recorded class videos that the students can replay after the session. Hence, many students are satisfied with remote teaching during pandemic periods [14]. Moreover, they were pleased with the quality of e-learning materials provided during this e-learning period [4], [18]. There would be a long-term impact due to pandemic on individuals and families [19]. ERT contributed to teaching staff capacity building and opened up new teaching and learning opportunities. It also provides a basis for innovations in the fields of teaching and learning [20].

The present study is undertaken with two specific objectives: i) To analyze the students' perception of ERT and ii) To explore the factors that determine the effectiveness of ERT during the pandemic period. Though there are quite a few studies in the field of e-learning during the pandemic period, studies that focus on examining the perception of students empirically using specific factors are limited. In this context, this research holds importance as the ERT learning system is also expected to be effective to a reasonable extent. The sudden change in teaching and learning should not affect the learners' ability to obtain the required amount of knowledge. Moreover, the teaching strategies practiced in ERT cannot be ignored completely once we go back to normal face-to-face teaching [21]. It is certainly going to change the way teaching and learning activities take place in the future too as the aftermath of ERT is expected to have some long-term impact on education. This might result in the adoption of innovative teaching methods [13]. Thus, the results of this empirical study fill the existing gap in the literature by emphasizing the dimensions that enhance the effectiveness of ERT. By evaluating the effectiveness of ERT, the HEIs will be able to develop effective strategies to implement the relevant dimensions during face-to-face delivery.

2. RESEARCH METHOD

The target population of our study is the students of HEIs in the Sultanate of Oman. To get the response as quickly as possible, we considered the online survey method to reach the students of HEIs across the country. Therefore, the present study uses the purposive sampling technique.

The data were collected using a structured questionnaire that consists of close-ended questions. Several researchers have used different dimensions to evaluate the effectiveness of e-learning and online learning [22]–[24]. Previous researches [25]–[27] proposed 10 dimensions to explore the effectiveness of e-learning using grounded theory. The learners consider these dimensions to value e-learning. Hence, they can act as a measurement tool to emphasize the effectiveness of ERT also. In this research, out of these 10 dimensions, the researchers identified (after duly consulting the experts in the e-learning field) eight dimensions viz., technology, pedagogy, motivation, usability, materials, support for learners, interactivity, and assessment that are relevant to the context of our study. This study uses those dimensions with significant modification to study the ERT phenomenon. The study variable technology comprises the software and hardware support, learning platform, communication possibilities, and network capacity of online education.

The pedagogy dimension consists of the delivery method used by the teacher, the influence of the teaching method, and student interaction in online learning. The motivation factor represents students' self-interest in online education, how they motivate themselves to attend online classes, and their confidence level. The material dimension relates to the availability of course content and its quality and other supporting materials for online learning. The support for learners includes the psychological and social support for students, teachers' support beyond content delivery, institutional support, and peer learning support in the online environment. The usability dimension of online learning refers to the accessibility of online platforms, easy navigation, and the user-friendly features of online platforms. The assessment dimension covers the appropriateness of the assessment technique to the online learning style, the relevance of the assessment technique used, review feedback on the assessment, and students' achievements. Finally, the interactivity factor consists of interaction with other students and getting adequate information directly from the learning material.

Initially, the study used 42 statements to measure all these dimensions. But based on the opinion of experts, a few student participants, and the reliability statistics obtained through the pilot test, the statements of the survey questionnaire were reduced to thirty-three. Students' perception of ERT was measured using a 5-point Likert scale where '5' represents strongly agree, and '1' denotes strongly disagree. The overall Cronbach's alpha value of the instrument was 0.972, which shows the high-level reliability of the instrument. The effectiveness of online learning was measured using three dimensions viz. acceptance, usefulness, and willingness. These dimensions were also measured using a 5-point Likert scale.

This study is purely based on primary sources of data. A structured questionnaire was prepared to collect the data using google forms. The online survey link was shared through emails and social media with the students in different colleges and universities in the Sultanate of Oman. The survey link was active for seven days. At the end of the survey period, we could get responses from 211 students. There were eight incomplete responses. Hence, the sample size of this study is 203. The respondents are from different governorates in the country like South Al Sharqiyah, North Al Sharqiyah, South Al Batinah, North Al Batinah, Al Dakhiliyah, Al Dahirah, and Muscat. The data analysis was performed using multiple regression analysis to explore the various dimensions of online learning that determine its effectiveness. The analysis is done with the help of the International Business Machines Corporation (IBM) statistical package for the social sciences (SPSS) software (version 20).

3. RESULTS AND DISCUSSION

Participants' profile information like age, level of study, type of HEIs, computer usage experience, the device used for online classes, and online teaching platforms have been obtained and presented in Table 1. It shows that 91.1% of the respondents are less than 25 years. Most of the respondents study undergraduate degree courses (51.7%), and 79.3% are from government institutions. Most of the participants have considerable experience in using the computer. A vast majority of the respondents (70.4%) use a laptop, and Microsoft Team is a popular platform used for ERT during the pandemic period. We measured the students' perception of ERT on eight dimensions. Table 2 presents the summary statistics of the various dimensions of ERT.

Based on the mean value, the participants considered usability, motivation, and material as the top three significant dimensions in ERT during the pandemic period. On the contrary, they exhibit a significantly lower perception of assessment, pedagogy, and support for learners. Therefore, these aspects of emergency remote learning need improvement. Participants' opinion about the effectiveness of ERT during the pandemic period was obtained using three measurement items: acceptance usefulness, and willingness to continue ERT during the pandemic period. The results are given in Table 3.

Table 1. Democratic profile

Profile	Parameter	No. of respondents	Percentage
Age	Less than 25 years	185	91.1%
	Above 25 years	18	8.9%
Level of study	Diploma	62	30.5%
	Advanced Diploma	36	17.7%
	Undergraduate	105	51.7%
Type of HEIs	Government institutions	161	79.3%
	Private institutions	42	20.7%
Computer usage experience	Less than five years	50	24.6%
	5-10 years	73	36.0%
	Above 10 years	80	39.4%
The device used for online classes	Laptop	143	70.4%
	Desktop	4	2.0%
	Smartphone	46	22.7%
	Tablets	10	4.9%
Online teaching platforms	Microsoft teams	159	78.3%
	Zoom	10	4.9%
	Google Classroom	12	5.9%
	Others	22	10.8%

Table 2. Summary statistics

Dimensions	Mean	STD
Technology	2.93	1.068
Pedagogy	2.69	0.959
Material	2.94	1.072
Support for learners	2.70	1.051
Usability	3.02	1.075
Interactivity	2.89	1.093
Assessment	2.63	1.058
Motivation	2.97	1.096

Table 3. Effectiveness of ERT during the pandemic period

Item	Likert scale response %				
	Very low	Low	Moderate	High	Very high
Acceptance to ERT	19.2	12.8	40.9	17.7	9.4
The usefulness of ERT	15.8	20.2	45.3	14.3	4.4
Willingness to continue ERT	17.7	14.8	26.1	25.1	16.3

The results indicate that most of the students have valued the effectiveness dimensions at a moderate level. Though a significant proportion of students have a high (17.7%) and extreme (9.4%) level of acceptance, the proportion of very low (19.2%) and low (12.8%) outnumbered them. It shows that the students have a low level of acceptance for ERT. Similarly, the usefulness of ERT also has a low level of response. It seems that the sudden transition to online teaching did not go down well with the students who were used to learning through face-to-face classes. Stevens *et al.* [28] also highlighted that the transition to online delivery has the potential to compromise academic quality and curriculum standards when academics are overworked, and institutional support is not adequate.

Interestingly, many participants have willing to continue ERT. As per the result, the moderate, high, and very high levels of willingness to continue ERT during the pandemic are 26.1%, 25.1%, and 16.3% respectively. Though ERT is not optional for the students, it is worth it because the students were determined to continue their studies online during the pandemic. This result is also consistent with previous studies [14], [17]. This shows that they prefer to utilize the available learning opportunity. This enables them to acquire their ambitious academic qualifications on time. Moreover, it keeps them active and engaged during the pandemic period.

3.1. Factors determining the effectiveness of ERT

Multiple regression analysis is used in this study to explore the dimensions that determine the effectiveness of ERT. It was found that the correlation coefficient (R) is 0.595. It shows a moderate positive correlation between the observed and predicted value of the effectiveness of ERT during the pandemic period. The predicted value of effectiveness of ERT was obtained as a linear combination of technology (X_1), pedagogy (X_2), motivation (X_3), usability (X_4), materials (X_5), support for learners (X_6), interactivity (X_7) and assessment (X_8). R square, the coefficient of multiple determination was found to be 0.355. It indicated

that 35.5% of the variance in the effectiveness of ERT is explained by technology, pedagogy, motivation, usability, materials, support for learners, interactivity, and assessment. The resulting F value was 13.32 with a probability value of less than 1%. Hence, there is enough evidence to conclude that the technology, pedagogy, motivation, usability, materials, support for learners, interactivity, and assessment dimensions could predict the effectiveness of ERT to a certain level. Furthermore, a t-test was performed to check the significance level of regression coefficients. The results can be seen in Table 4.

Table 4. Regression model coefficient

Variables	Coefficients	t-value	p-value
(Constant)	1.105	5.588	.000
Technology	.016	.184	.855
Pedagogy	.080	.716	.475
Motivation	.290	3.134	.002
Usability	.207	1.729	.085
Material	.096	.807	.420
Support for learning	.048	.480	.632
Interactivity	.146	1.467	.144
Assessment	.277	3.268	.001

From the coefficient value, the regression equation representing the relation between the dependent and independent variables is as (1):

$$Y = 1.105 + 0.016X_1 + 0.080X_2 + 0.290X_3 + 0.207X_4 + 0.096X_5 + 0.048X_6 + 0.146X_7 + 0.277X_8 \quad (1)$$

Among the eight dimensions, motivation and assessment have a significant impact on the effectiveness of ERT. The coefficient for X_3 is 0.290, and the p -value is less than a 1% level of significance. Therefore, the partial effect of the motivation dimension on the effectiveness of ERT is statistically significant when the other variables are constant. It indicates that every unit increase in motivation perception is expected to increase the effectiveness of ERT by 0.290 units. The coefficient for X_8 is 0.277, and the p -value is significant at less than 1% level. Therefore, the partial effect of the assessment dimension on the effectiveness of ERT is statistically significant when the other variables are constant. It indicates that every unit increase in assessment perception is expected to increase the effectiveness of ERT by 0.277 units.

The p -value of X_1 , X_2 , X_4 , X_5 , X_6 , and X_7 are more than a 5% level of significance. Therefore, the partial effect of technology, pedagogy, usability, materials, support for learners, and interactivity dimensions on the effectiveness of ERT is not statistically significant when the other variables are constant. The positive coefficient value of these dimensions indicates that the increase in participants' perception is expected to increase the effectiveness of ERT by their respective coefficient values. Based on the coefficient, motivation is the most important factor, followed by assessments and usability that determine the effectiveness of ERT. Our result is also consistent with the World Bank statement, which mentioned that highly motivated students with independent learning abilities could take advantage of online learning [29]. Osman [4] also indicated the effect of students' motivation on remote learning, who envisaged that the student's readiness for e-learning requires a mastery level of motivation and self-regulation skills. He also reported that the assessment of students' performance in online environments remains a challenging factor in this environment which is also in line with our result.

Due to academic integrity concerns, the HEIs follow some specific assessment schemes to evaluate the students in online learning. The assessment is one of the factors which predominantly influences the effectiveness of remote learning. Therefore, the HEIs in the Sultanate of Oman should carefully craft and implement various types of assessment techniques adhering to the academic integrity guidelines. They may also develop innovative assessment techniques meant explicitly for online teaching and learning. Gamage, Silva, and Gunawardhana [30] reported that the innovative assessment practices followed by various HEIs. Some of the highlighted assessments are student conferences, presenting to an industry panelist, group report, poster, presenting to a large group of academics, video presentation, video-based uploads using cloud technology, submitting an online portfolio, and online simulation-based tasks as substitutes to traditional assessments. Adopting such innovative assessment practices would enhance the effectiveness of online learning in this environment.

Students' motivation appears to be the fundamental factor in the effectiveness of online learning during this pandemic period [10]. It would be challenging for the students to stay motivated because they were exposed to severe stress due to the lockdown and non-involvement in physical activities. Their home

environment may not be as conducive as the classroom environment as far as learning is concerned. The HEIs, through academic advisors, can take active participation in shaping students' mindsets to stay motivated. They can also provide appropriate motivational guidance through external experts while continuing online learning. Furthermore, research has shown that there is a significant correlation between student motivation and teacher performance [31]. As a result, students' motivation would lead to a better learning environment and better achievement of learning outcomes.

4. CONCLUSION

Online learning becomes the only possible mode of teaching during the pandemic period thanks to technological advancement in the education field. Otherwise, the pandemic period would have proved to be unproductive. Though online learning is the available option, it must help learners learn effectively at least to a considerable extent. This expectation implies that the required essential quality of learning and teaching should not be affected due to the sudden adoption of ERT. Therefore, the present research intended to study the learners' perception of the effectiveness of ERT. The study results show that the students prefer to utilize the available learning opportunity to acquire academic qualifications on time. However, the sudden transition to ERT did compromise the efficacy of academic delivery to the students and hence they exhibited a low level of acceptance of ERT. Moreover, this study explores the effectiveness of ERT using different dimensions. Out of eight dimensions, motivation and assessment were the crucial factors that determined the effectiveness of ERT amid the pandemic period in the study area.

This research explored the effectiveness of ERT in the COVID-19 pandemic environment. Therefore, the result of the study may not apply to regular online education and e-learning. This research work was carried out with normal students only. Consequently, the result should not be applied to the context of special needs or disabled students. Furthermore, the availability of technological infrastructure, the online learning method, and the teaching method adopted in this country may not apply to other parts of the world. Hence, the result of this study cannot be generalized to another country. Recently, there were several noticeable changes in online teaching platforms, and thus the capability of the teaching staff also would have changed. Hence, the result of this study may not be applicable for the entire COVID-19 pandemic period. Moreover, this research was conducted with eight dimensions that were relevant to the study context. However, these dimensions are not an all-encompassing set. Any inclusion, exclusions, and modifications in those dimensions are expected to alter the result of this study.

This study explores the effectiveness of ERT based on the perception of students. Further studies can be conducted with teaching staff about the effectiveness of ERT, problems in online learning and issues in online teaching. Furthermore, this study result shows that motivation and assessment were the crucial factors determining the effectiveness of ERT. Therefore, in-depth studies can be conducted on these dimensions to understand them in a comprehensive manner.

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