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Determining the Challenges in Implementing E-Learning Systems in Private Secondary Schools in Yemen

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Abstract

Education is one of the most important components of societies and one of the most important reasons for the Renaissance and development of nations. Countries, especially developed countries, strive to improve and develop their educational environments and introduce technology and modern tools into their educational systems. In contrast, the emergence of the COVID-19 pandemic has had a major impact on the education system around the world. Therefore, many countries have resorted to distance learning to mitigate the impact of the epidemic outbreak and avoid the suspension of the educational process. In developing and less developed countries such as Yemen, the e-learning process faces many obstacles. Yemen was among the countries where formal education was suspended due to the pandemic and there was no effective alternative to full continuity of education. Schools in Yemen face some challenges in terms of implementing electronic learning (e-learning), but private schools have some elements for implementing e-learning.

This study aims to identify the challenges facing the implementation of e-learning in Yemeni private schools. A qualitative research method was used to achieve the objective of this study. The working group of the study was 28 volunteer participants (9 managers and 19 teachers) in 13 private secondary schools in Mukalla city in Yemen. The semi-structured interview form which consists of 33 open-ended questions was used as a data collection tool within the scope of the research. The data obtained after the interviews were analyzed using descriptive and content analysis techniques. It was noted that the private secondary schools in Yemen face individual, content, curriculum, and technical challenges in front of implementing learning systems. As a result of the study, the problems encountered and proposed solutions were identified, as well as suggestions for researchers for future studies.

Keywords: E-learning; E-Learning Systems; Challenges; Implementation; Private Secondary Schools; Yemen.

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Yemen'deki Özel Ortaokullarda E-Öğrenme Sistemlerinin Uygulanmasında Karşılaşılan Zorlukların Belirlenmesi

Özet

Eğitim, toplumların en önemli bileşenlerinden biridir. Ülkeler, özellikle gelişmiş ülkeler, eğitim ortamlarını iyileştirmek ve geliştirmek için teknoloji ve modern araçları eğitim sistemlerine dâhil etmek için çaba göstermektedir. Ayrıca birçok ülke KOVID-19 küresel salgının etkisini azaltmak ve eğitim sürecinin aksamasını önlemek için uzaktan eğitim sistemlerini kullanmaya başlamıştır. Bu süreçte Yemen gibi gelişmekte olan ve az gelişmiş ülkeler de bu yeni uzaktan eğitim sürecinde birçok engellerle karşılaşmışlardır. Yemen'deki mevcut durum ve bunun siyasi ve ekonomik yansımaları nedeniyle Yemen, salgın nedeniyle örgün eğitime ara verilen ülkeler arasında yer almış ve devlet eğitimin tam sürekliliği için etkili bir alternatif de sunamamıştır. Aynı doğrultuda özel ortaokullar da uzaktan eğitimi uygulamak için bazı sorunlar ve zorluklarda karşılaşmışlardır.

Bu çalışmanın amacı, Yemen özel ortaokullarında e-öğrenmenin uygulanmasında karşılaşılan zorlukları ortaya koymaktır. Bu çalışmanın amacına ulaşmak için nitel araştırma yöntemi kullanılmıştır. Araştırmanın çalışma grubu Yemen'in Mukalla şehrinde bulunan 13 özel ortaokulda görev yapan 9 müdür ve 19 öğretmen olmak üzere 28 gönüllü katılımcıdır. Araştırma kapsamında veri toplama aracı olarak 33 sorudan oluşan yarı yapılandırılmış görüşme formu kullanılmıştır. Katılımcılarla telefon yoluyla iletişime geçilip araştırma hakkında detaylı bilgilendirmeler yapıldıktan sonra, görüşme sorularını içeren bir Google formu yanıtlamaları istenmiştir. Görüşmeler sonrasında elde edilen veriler betimsel ve içerik analizi teknikleri kullanılarak çözümlenmiştir. Yemen'deki özel ortaokulların, öğrenme yönetim sistemlerinin uygulanması önünde bireysel, içerik, müfredat ve teknik zorluklarla karşı karşıya olduğu görülmüştür. Çalışma sonucunda, karşılaşılan sorunlar ve çözüm önerileri belirlenmiş, ayrıca araştırmacılara gelecek çalışmalar için önerilerde bulunulmuştur.

Anahtar Kelimeler: E-Öğrenme, E-Öğrenme Sistemi; Zorluklar, Uygulama, Özel Okullar, Yemen.

Introduction

Education is one of the most important factors that contribute to the rise and advancement of nations. For this, countries have worked to develop the education sector and pay attention to institutions and departments concerned with education. With the development of technology, the educational process has also become complex and is no longer confined to the classroom and traditional learning.

Distance education is a modern and popular education system that does not require the students and lecturers to come together and the lessons are held in a virtual environment. In other words, distance education is a type of education that is carried out completely independently of time and environment (King et al., 2001). Distance education could also be defined as the process of transferring knowledge to the learner at his place of residence or work instead of transferring it to the educational institution. It is based primarily on the delivery of knowledge, skills, and educational materials to the learner through different technical media and methods, where the learner is separated from the teacher (Vázquez, 2022). With the advancement of technology and electronic communications, distance education has turned into education using computers, the Internet, and multimedia to achieve maximum effectiveness, and all this was shaped by the revolution in the field of information technology (Keevy & Chakroun, 2015).

Developing countries such as Yemen continue to face significant challenges in implementing e-learning, which requires a high degree of technological

infrastructure and significant financial investment. On the other hand, universities in Yemen are making significant efforts to implement distance education (Muthanna & Karaman, 2014). However, there are many challenges that stand in the way of fully using e-learning as an alternative teaching and learning tool in Yemen, including infrastructure, technology, legislation, and concerns. As a result of these challenges, most educational institutions in Yemen are still in the early stages of integrating e-learning (Al-Haderi, 2013).

This study aims to identify the challenges faced by private secondary schools in Yemen in the process of implementing e-learning and to reveal the solutions they have come up with to meet these challenges. In fact, there is a lot of research in the literature on this area, but it may not be specific to Yemen. Regarding the topic of research, in Aldowah's study (Aldowah et al., 2018), the challenges of teachers in implementing e-learning in a public university in Yemen has been examined from the perspective of trainers in a Yemeni public university. In Mahmud's (Mahmud, 2010) study reported the difficulties encountered were largely technical followed by individual challenges. Another study done by Al-Azawei (Al-Azawei et al., 2016), was about the obstacles and opportunities for applying e-learning in public universities in Iraq. Researchers found that the biggest challenge is the poor infrastructure of the country. The study of Mutair (Mutair, 2021) has researched the topic of the challenges of activating e-learning systems and also revealed the difficulties facing the reality of e-learning and its use and ways to reduce them in light of the Corona pandemic in schools in Gaza Governorate.

When examining the studies in the literature, it is noted that there is no comprehensive study that examined the challenges that schools in Yemen face in activating e-learning systems, or provides solutions to these problems. Therefore, this study will contribute significantly by bridging the gap in the literature in terms of a comprehensive investigation of the obstacles facing the activation of e-learning systems in schools in Yemen, as well as this study will contribute to finding solutions to these problems. It is believed that this study will be a guiding work for institutions that will operate e-learning systems.

The main research question of the study was as follows:

- What are the obstacles and solution suggestions facing private secondary schools in Yemen in the implementation of e-learning systems and what are the solutions to these obstacles?

Based on Andersson and Grönlund's (2009) conceptual framework, this study aims to identify issues that are individual challenges, curriculum challenges, content challenges, and technical challenges in the implementation and development of e-learning. In addition, as a result of the literature review, it has been seen that there are many studies supporting this conceptual framework (Aldowah et al., 2018; Anene et al., 2014; Apostolakis, 2006; Alsabawy et al., 2013; Al-Azawei et al., 2016; Al-Shboul and Alsmadi, 2010; Boulton, 2008; Jhurree,

2005; Lassoued et al., 2020; Mahmud, 2010; Mutair, 2021; Nawaz & Zubair Khan, 2012; Rais et al., 2004; Tarus et al., 2015; Tedre et al., 2010; Varlamis & Apostolakis, 2006). Therefore, the data collection tool for this study has been prepared on the basis of these four identified challenges.

This study aims to fill a gap in the literature by offering a vision for Yemeni schools in particular, and developing countries in general, by identifying the barriers that inhibit school principals and instructors from using e-learning. As well as identifying the obstacles to e-learning adoption in the country. The research is expected to serve as the basis for future schools that will employ e-learning. This research aims to assist schools in understanding and identifying the difficulties they will encounter and take precautions to avoid problems and find solutions to help them succeed in e-learning.

Method

Research Method

In this study, a qualitative research method was used. The research is a case study, which is one of the qualitative research methods that allow for in-depth investigation and comprehension of the scenario (Fossey et al., 2002). It is a methodical pattern that comprises processes such as data collection, organization, analysis, and accessibility to research findings.

This qualitative research aims to identify the problems facing Yemeni private secondary schools in the implementation of e-learning accurately and to suggest solutions to them. This type of research provides an opportunity to convey the experiences and beliefs of the participants in the schools interviewed, and to provide in-depth information by obtaining perceptions and events by following a qualitative process and qualitative data acquisition methods such as observation, interview and document analysis (Creswell & Creswell, 2017).

The Working Group

The working group of this research consists of private Yemeni secondary schools. The reason for choosing private secondary schools is that private schools have many elements that enable them to implement e-learning, such as a good financial budget, student information systems for schools, qualified technical staff, and the ability of parents to provide electronic devices for their children as well as the affordability of internet packages for education. The researcher is also from Yemen and works for the Yemeni Ministry of Education and will be able to conduct interviews with school principals and teachers in Yemen during the data collection process. These schools were identified through the Special Education Department of the Yemeni Ministry of Education. As a result, 22 secondary schools eligible to be contacted were identified as these schools constitute the working group.

Electronic invitation letters (via email and WhatsApp) attached to a letter from the Yemeni Ministry of Education (1/8382/56) to facilitate the task, were sent

to the private secondary schools that comprise the research sample to participate in the study. Principals of these schools were also contacted via telephone and the Internet, where detailed information about the study was provided and a request was made for interviews with principals and teachers from these schools. In addition, the approval of the Ethics Committee (08.02.2022/02) obtained from the Social and Human Ethics Committee of Ankara Yıldırım Beyazıt University and the letters of permission and prior approval obtained from the Institute of Social Sciences were shared with the schools.

In this study, 13 schools out of 22 accepted the interview request, and 6 schools apologized for not participating and explained the reason for their apology because they were busy preparing for final exams, and were unable to devote themselves to the interview. The remaining three schools refused the interview and did not respond to it. For this reason, this study is limited to 13 schools that accepted an interview request. A total of 28 participants who agreed to be interviewed from 13 schools in the study were interviewed between a school principal and a teacher.

Table 1: Schools with a Number of Participants

School	Participants	Total
S1, S3, S5, S6, S8, S12	1	6
S4, S9,	2	4
S2, S11, S13	3	9
S7	4	4
S10	5	5
Total		28

In this study, schools and participants want their names to remain confidential. Schools are coded as S1, S2, S3...S13, and principals are represented as M1, M2...M9. While teachers were identified as T1, T2, ... T19. Table 1 presents the schools that were included in the research and the number of participants from each school.

Data Collection Tool

In this study, a semi-structured interview form was prepared as a data collection tool. The reason for this is that it makes it easier to receive in-depth information and provides the opportunity to ask questions at the end. The researcher prepared the interview form questions after reviewing the literature. The final format of the semi-structured interview form was created using the opinions received from the field experts.

According to the field experts' opinions, the misspellings in the questions in the interview form have been corrected. In addition, two new questions have been added to the interview form. Some appropriate changes have also been made to the

existing questions. As a result, the final form of the semi-structured interview form was created referring to the opinions received from the field experts.

There are two main sections in the interview form. The first main section contains demographic information (gender, age group, job as a manager or teacher, years of experience, work field, educational level, computer skills, previous training in e-learning, and whether or not they used an e-learning system) about the 28 research participants.

The second main section contains questions related to the challenges facing the activation of e-learning. There are four subsections in the second main section. respectively; individual teacher and student challenges, curriculum challenges, content challenges, and technical challenges. In the second part, questions about the challenges facing the activation of e-learning are included. In the first subsection, there are questions about the individual challenges of activating e-learning for the teacher or student (12 questions). In the second subsection, there are 3 questions about challenges related to educational curriculum and designing them in line with e-learning. In the third subsection, there are 5 questions about identifying the problems related to content and financial, administrative, and organizational capacity that private secondary schools face in front of activating e-learning. In the fourth and final sub-section, 5 questions related to the technical challenges facing the school, and challenges that teachers and students face in implementing e-learning are included. In the interview form, there are 33 questions in total, including 8 demographic information questions about the participants.

Data Collection Process

Interviews with a semi-structured interview form were used to collect data for this study. Semi-structured interview forms are neither as rigid as fully structured interview forms. This kind of data gathering encompasses all aspects of the subject and allows for more open-ended queries (Creswell & Creswell, 2017). After obtaining approval from the participants, including school principals and teachers, via e-mail and WhatsApp, they were contacted and interviews were scheduled. However, due to the severe weakness in the internet service and the inability to conduct interviews with the participants directly via the Zoom program, interview questions were sent to them via e-mail and WhatsApp, and a form was made from Google with interview questions. The participants were contacted by telephone individually and were informed about the purpose and scope of the study and the concepts related to the topic of the research, as well as an explanation of the interview questions, details, and information related to them. Since the participants did not have the opportunity to conduct the interviews over the Internet, they preferred to answer the interview questions via e-mail or using Google Forms. The interviews and data collection process took place between March 1, 2022, and March 31, 2022. Answers to questions, with the permission of the participants, are

kept confidential to preserve the privacy of the participants. After the interviews, interview transcripts were prepared and the responses of the participants were written individually. To ensure the accuracy and validity of the transcripts, the transcripts were sent back to the participants via email and WhatsApp, and their consent was obtained. All participants confirmed that the minutes of the interview and the content of the interview transcripts were appropriate.

Data Analysis

The data from the interviews was examined utilizing descriptive analysis methods and content analysis throughout this study. The material gathered according to preset topics is summarized and corroborated through direct quotations in descriptive analysis. The conceptual framework developed as a consequence of the literature study was employed in the content analysis. The replies were categorized and classified within the conceptual framework. As a consequence, similar sentences were merged and translated as specific notions.

Validity and Reliability

To ensure the validity of this study, the supervisor's opinion on the questions in the interview form was obtained. Emails and Google Forms were used to conduct the interviews. The participants were shown the data obtained and asked to confirm it. In addition, the descriptive analysis of the data includes direct citations. The researcher evaluated and encoded the identical texts afterward translating the qualitative data in this study into English. The researcher initially discussed and established his role in the research procedure to ensure the study's legitimacy. The participants were given detailed information, as well as an explanation of the setting and methods in which the interviews were performed. The conceptual framework for the analysis of data is discussed, as well as data gathering methodologies were discussed. In addition, all of the information gathered was saved in order to be submitted for review if necessary.

The Ethical Dimension of Research

Permission was obtained from relevant institutions to conduct interviews with participants within the scope of the thesis study, and a letter was obtained from the Yemeni Ministry of Education addressed to private schools to cooperate with the researcher. Documents were sent to participants via email and WhatsApp prior to the interviews. Study participants were given detailed information about the researcher's identity, the purpose of the research, where and how the information received was used, and knowledge that participation in the study was voluntary and the participant could leave the study at any stage. After explaining the reason for selecting the participants, the interviews began after obtaining written and oral consent from the participants to record the interviews.

FINDINGS

This section contains reviews from interviews with 28 participants (9 managers and 19 teachers) from 13 private secondary schools in Yemen who volunteered to participate in the study.

Participants Information

The demographic information collected about 28 research participants is presented in Table 2. When Table 2 is examined, it is seen that 64% of the participants used the e-learning system previously. In addition, the same percentage of participants received e-learning system training.

Individual Challenges

In the Individual Challenges section, which forms the second part of the semi-structured interview form, 12 questions are asked to the participants divided into two parts: seven questions about teacher challenges, and five questions about student challenges.

In the section on teacher challenges, the first question was about what are the general opinions about e-learning systems, where the participants' answers were summarized as follows: Participant 4 answered "*Learning management systems are effective, but they do not replace the presence of interactive learning*." Regarding the second question of this section, which presented the participants' opinions about the use of technology in educational environments, most of the participants answered that the use of technology in educational environments is very important and enriches the educational process and makes it easily accessible to the learner but it needs more activation. Participant 6 said, "*Due to the requirements of the Internet, where there is a challenge to both network strength and costs, we only use this in emergencies. This happened during Covid-19 emergencies.*" The fourth question in this section was about the participant's readiness for training in the use of e-learning systems. All participants answered that they are ready for training. While Participant 6 answered "*Yes. But only that we have challenges of time*." The fifth question asked the participants about their ability to teach via e-learning. Most of the participants answered that they can teach via e-learning. Participants 6, 11, and 21 also confirmed that they already do electronic teaching in their schools. While participants 15 and 26 answered that they could not because they were not yet qualified to do so. The sixth question was about the participants' opinions of the obstacles to using e-learning. Two-thirds of participants answered that poor infrastructure in the country is the main obstacle to the use of e-learning. While participant 3 answered, "*In my view, the high operational budget is the most important obstacle, as is the student's weak scientific background*."

Table 2: Participants Information

No.	Participant	Gender	Age Level	Years of	Specialization	Education Level	Having e-learning	Using an e-learning	E-learning system name
	1		46-55	42	Educational Administration	Ph. D.	Yes	No	-
	2		>56	3	Education	Bachelor's	No	No	-
	3		>56	8	Educational Administration	Secondary	Yes	Yes	Zoom
	4		36-45		Administration	Bachelor's	No	No	-
	5		46-55	0	Educational Administrat	Bachelor's	Yes	Yes	Google Classroom, Clasera
	6		36-45	3	Principle	Masters	No	Yes	Zoom, KENET, Google Classroom
	7		46-55	5	Education	Bachelor's	No	Yes	University e-learning system
	8		46-55	6	Education	Bachelor's	Yes	Yes	Clasera
	9		46-55		Bussiness Administration	Bachelor's	No	No	-
0	1		46-55	9	Chemistry	Bachelor's	Yes	Yes	Google Meet and others

No.	Participant	Gender	Age Level	Years of	Specialization	Education Level	Having e-learning	Using an e-learning	E-learning system name
1	2		46-55	40	Computer	Bachelor's	No	Yes	Clasera
2	3		26-35		Teacher	Masters	Yes	Yes	-
3	4		18-25	1	Teacher	Bachelor's	Yes	Yes	Various e-learning platforms
4	5		36-45	3	Social Sciences	Secondary	Yes	No	-
5	6		36-45	30	Computer	Secondary	Yes	Yes	Altaif
6	7		36-45	3	Teacher	Bachelor's	No	No	-
7	8		26-35	2	Teacher	Masters	Yes	Yes	Various e-learning platforms
8	9		26-35	2	Teacher	Bachelor's	No	Yes	Rawaq platform
9	10		46-55	40	Scientific Materials	Secondary	Yes	Yes	Noon platform (KSA)
0	11		36-45	39	English Language	Bachelor's	Yes	Yes	British Council, Rania Queen
1	12		36-45	30	Islamic Studies	Bachelor's	No	No	-

No.	Participant	Gender	Age Level	Years of	Specialization	Education Level	Having e-learning	Using an e-learning	E-learning system name
2	13		26-35		English Language	Masters	Yes	No	-
3	14		46-55	3	Teacher	Bachelor's	Yes	No	-
4	15		26-35		Computer	Bachelor's	Yes	Yes	Recorded video sharing
5	16		26-35		Teacher	Bachelor's	No	No	-
6	17		36-45	6	Teacher	Bachelor's	Yes	Yes	Idrak
7	18		26-35		Physic & Math	Bachelor's	Yes	Yes	Blackboard
8	19		36-45	2	IT Training	Bachelor's	Yes	Yes	Zoom

The seventh and final teacher challenges the question, which asks participants if they can liken e-learning to an object, shape, or animal, a myth hero, a historical identity, or an organism, which one is that like? why? Participants 1, 8, 5, and 17 answered that it is like a bird because it flies in the air, it arrives quickly and reliably in transmitting information. Participants 2, 7, 13, and 14 answered that the closest analogy to e-learning is mobile because you can get your tasks done quickly and with super fun.

The eighth question in this section, which is considered the first question in the student's challenges, asked the participants their opinion of the student's motives for learning through e-learning systems, and the extent of their discipline in using them. Half of the participants believe that students have a positive attitude and strong motivation towards e-learning, as well as good discipline while using it. While five of the participants think that the student's motivation is great, the discipline, which is the most important, may decrease with the days. The ninth question in this section, and the second in the student's challenges, asked about their

belief whether the application of e-learning would constitute a financial burden on parents, and their ability to bear this burden. Nearly two-thirds of the participants answered that the application of e-learning will constitute a financial burden on parents and that they will not be able to somehow afford it. The tenth question in this section, and the third in Student Challenges, asked participants how confident are they participants about the effect of a student's gender, age, and several siblings on the use of e-learning. Most of the participants answered that there is no effect of gender and age on the use of e-learning in their belief, as most students at the secondary level can use technology well. But about the number of siblings, they believe that this has a negative effect as the number increases in one family. Some participants also believed that it was possible to control the number of two siblings in the same household. The eleventh question in this section, and the fourth in student challenges, asked the participants about their opinion on how to qualify students to acquire the necessary competence to use e-learning. Most of the participants said that this can be done by subjecting the students to workshops on how to deal with the new electronic system and taking training courses in the field of e-learning. As participant 1 answered, "*This can be done by changing the educational curriculum*." The twelfth question in this section, and the fifth and final question in Student Challenges, asked participants about how confident students are in using e-learning. Nearly two-thirds of respondents answered that they had great confidence. Where the student also finds videos, files, and links that enhance his knowledge and skills. Participant 19 added, "*Students trust 100% of this, but there are very few parents who trust this education*."

Table 3: Challenges and Suggested Solutions Arising from Individuals

	Participants	Problems	Solution
1	3, 5, 6	Inadequate qualifications of students and teachers	Training and rehabilitation from the
2	3, 5, 6	Poor computer skills for	-
3	5, 6, 22, 28	Difficulty using the system	
4	6, 11, 14,	Low confidence in the e-	
5	8	Mental weakness of the	-
6	6, 20, 27, 28	Lack of motivation among some students and their lack of interest in learning from home	Community awareness of the importance and
7	19, 28	Not enough societal	
8	3, 4, 12, 28	Poor financial ability of	-
9	Most of the participants	Increasing the number of siblings in the same family	Sync lessons at different times

In the individual difficulties section, which constitutes the second part of the semi-structured interview form, all the answers received from the students and teachers were examined. The challenges the teachers and students faced and the suggested solutions are presented in Table 3.

Curriculum-Related Challenges

In the "Curriculum-Related Challenges" section, which forms the third part of the semi-structured interview form, three questions are asked to the participants.

The first question in this section, which was asked to the participants, express their opinion on the obstacles facing the design of e-learning curriculum. Participants 1 and 3 answered that the experience is weak in e-learning and its curriculum and that the state does not adopt this type of education. Participants 4, 9, 12, 14, and 23 answered that the difficulty and severity of the curriculum constitute an obstacle. One-third of the participants stressed that there is an obstacle to the lack of experts in this field, especially the practical aspect of the curriculum. The second question in this section, which was asked to the participants, express their opinion on the efficiency of applying the various duties and activities in e-learning. A third of respondents answered that it is good, as it depends on the quality of the design and the calendar. While participants 3, 11, 12, and 17 said that they see the efficiency of carrying out various duties and activities in e-learning as poor. Participants 4, 7, 8, 9, 10, 13, 14, and 16 see them as excellent and highly efficient. Participant 26 added: *"From my point of view, the efficiency will be high, but we will miss some activities that develop only some skills, such as calligraphy, dialogue, body language, and others."* The third and final question in this section, which was asked to the participants, is about how to ensure the flexibility of the performance of e-learning programs in their performance. Participant 5 answered, *"Adjusting the curriculum to suit all ages and levels with e-learning, forming a positive public opinion towards e-learning by using the largest possible number of means, multiplicity of means, and ease of applications."* Participants 1, 4, 7, 8, 25, 9, 12, and 14 also answered that there is a need to simplify the curriculum and focus on the form of the system, ease of use, and updating.

Table 4: Curriculum-related Challenges and Suggested Solutions

	Participants	Problems	Solution Suggestions
1	1, 3, 6	Weakness of experience in the design and development of electronic curriculum	Design a curriculum appropriate to the environment and local culture
2	4, 9, 12, 14, 23	The difficulty and intensity of the curriculum	-
3	6	Difficulty carrying out practical lessons	Design a more interactive curriculum
4	3, 5, 11, 12, 17	Poor efficiency of duties and activities	
5	5, 14	Difficulty evaluating learner performance	

The data obtained from the interviews about the curriculum difficulties were examined. As a result of this review, it is seen that teachers and students faced curriculum-related challenges in implementing and managing the e-learning system. These problems and suggested solutions are presented in Table 4.

Contextual-Related Challenges

In the "Contextual-Related Challenges" section, which forms the fourth part of the semi-structured interview form, 5 questions are asked to the participants.

The first question in this section, asks the participants about their evaluation of the school administration's knowledge of the possibility of managing the e-learning system. Half of the participants answered that their knowledge of the school administration is good. While participants 16 and 20 answered that they are excellent at managing the e-learning system. Participants 7 and 13 also answered that the general management of the school is not hindered by an electronic system or direct education as long as the staff is educated and aware of the educational process around the world. The second question in this section asked the participants their opinion on the ability of the school's financial resources to implement e-learning in it. Participants 1, 2, 5, 9, 13, 14, 19, and 22 answered that it was possible but to some extent. As participant 6 replied, *"This will depend on the costs from the developer. If the system seems expensive, even when they have financial resources will allocate it minimally to benefit from the profit. The proprietor of private schools has their main interest in increasing profit."* While participants 7, 8, 15, 16, 17, 20, 24, 25, 26, 27, and 28 answered that the school's financial resources can implement e-learning.

The third question in this section asked the participants' opinions about the extent to which the school's financial resources can develop human resources while using technology related to learning management systems and e-learning. Participants 1, 2, 5, 7, 14, 16, 22, 24, and 25 answered as fully as possible. As Participant 6 responded, *"Once the school develops an interest in any relevant technology, it will always invest in it by directing some financial resources."* The fourth question in this section asked participants for their opinion about the extent to which the teacher and student perceive their role in interaction in the e-learning environment. Participants 1, 5, and 20 answered that they are very much aware of their role, having gone through the awareness-raising process well. Participants 3, 9, 13, 16, 17, 22, 27, and 28 responded that they consider teacher and student cognition to be average. While participant 4 answered, *"We are now in Yemen, we have not yet reached this awareness of the student, and sometimes even the teacher."* The fifth and final question in this section asked the participants their opinion about the impact of school decision makers' beliefs about e-learning on the application of e-learning in their schools. Two-thirds of participants answered that they believe that decision-makers have an important and positive influence.

Table 5. Contextual-related Challenges

	Participants	Problems
1	6	The lack of seriousness of some officials to activate these systems
2	4, 6, 8, 10, 11, 12, 18, 19, 26	Poor awareness of the importance and effectiveness of e-learning among decision-makers
3	4, 7, 10, 12, 18, 19, 20, 23, 27	Difficulties in developing human resources for the school

When the data obtained about the difficulties related to the content were evaluated as a result of the interviews, it was seen that the teachers and students faced the difficulties seen in Table 5. When Table 5 is examined, these difficulties are seen that the lack of seriousness of some officials to activate these systems, the lack of awareness of decision-makers, and difficulties in developing human resources for the school.

Technical Challenges

In the "Technical Challenges" section, which constitutes the fifth and final part of the interview form, five questions were asked to the participants.

The first question in this section that was asked to the participants is the availability of suitable devices for the student or teacher to be used in e-learning. Participants 1, 5, 6, 7, 12, 14, 16, 17, and 27 answered that the devices were widely available. While participants 2, 3, 8, 13, 18, 19, 22, 23, 25, 26, and 28 answered that they are available but on average. Participants 15 and 21 indicated that the percentage of devices available at the household level is low due to living and family conditions.

The second question in this section, which was asked to the participants, is the extent to which the school can provide the requirements for e-learning. Participants 1, 2, 4, 5, 7, 14, 16, 20, 22, and 25 answered that the school could provide the necessary equipment to a large extent. Participants 3, 17, 18, 24, and 27 answered that it is possible, but on average. The third question in this section asked the participants their opinion on the challenges facing the application of e-learning in the school and related to the provision of appropriate learning management systems (LMS). Most of the participants believe that the country's infrastructure problem, represented by the Internet and electricity, is a major obstacle. The fourth question in this section asked the participants their opinion on the impact of the power outage on the implementation of e-learning and how to avoid or deal with it. Participants unanimously agreed that this had a very significant impact. This can be avoided for schools by using private electric generators or solar energy. Participant 8 also added, "*It can be overcome with co-education or asynchronous learning.*" While most respondents said that for parents of students, this problem cannot be avoided due to the inability of most parents to provide alternative electricity basis continuously.

The fifth and final question in this section asked participants how easy it is for students or teachers to access the Internet, and their assessment of the quality of service they use. A third of the participants see difficulty in accessing the Internet, while participants 11, 12, and 15 see that the Internet is fairly good. Participants 5, 7, 13, 16, 17, and 28, believe that access to the Internet is easy and widely available. On the other hand, all of the participants agreed that the Internet service is very weak and its cost is high.

Table 6. Technical Challenges and Suggested Solutions

	Participants	Problems	Solution Suggestions
1	All of the participants	Frequent electric power cuts	Use of generators or solar energy
2	All of the participants	Poor internet service	-
3	All of the participants	The high cost of Internet service	Using Zoom program in some schools due to its availability, spread, and ease of use
4	3, 5, 10, 12, 15, 17, 18, 21, 23, 24, 27, 28	Lack of equipment to activate e-learning	
5	2, 3, 8, 13, 15, 18, 19, 22, 23, 25, 26, 28	Inadequate users' electronic devices for e-learning	-

When the data obtained as a result of the interviews were evaluated about technical challenges, it was noted that teachers and students face challenges in implementing and dealing with e-learning. These problems and suggested solutions are presented in Table 6.

DISCUSSION

In this section, results obtained from interviews conducted with 28 volunteer participants from private secondary school principals and teachers are compared with the results of similar studies in the literature previously reviewed in this research.

According to what was extracted from the previous literature about the individual challenges of implementing e-learning, and comparing them with the results of the interviews in this research, a great similarity can be observed between the individual challenges for both teachers and students in terms of poor ability to deal with these systems (Al-Azawei et al., 2016; Al-Shboul & Alsmadi, 2010; Alsabawy et al., 2013; Anene et al., 2014; Boulton, 2008; Mutair, 2021; Rais et al., 2004), as well as the lack of sufficient training on e-learning and use it (Aldowah et al., 2018; Boulton, 2008; Mutair, 2021; Tedre et al., 2010). It can also be seen that there is a lack of confidence in dealing with these systems (Al-Azawei et al., 2016; Boulton, 2008; Mutair, 2021; Tedre et al., 2010).

It is seen that the results of the studies on the curriculum-related difficulties of the e-learning application are parallel with the results of this study. These results are the weakness of training programs and the inflexibility of these systems. (Anene et al., 2014; Lassoued et al., 2020; Mutair, 2021; Rais et al., 2004), as well as the difficulty of updating electronic curricula and teaching methods (Mutair, 2021; Rais et al., 2004). It can also be noted that a comprehensive curriculum and a large number of its vocabulary constitute an obstacle to good electronic design (Mutair, 2021).

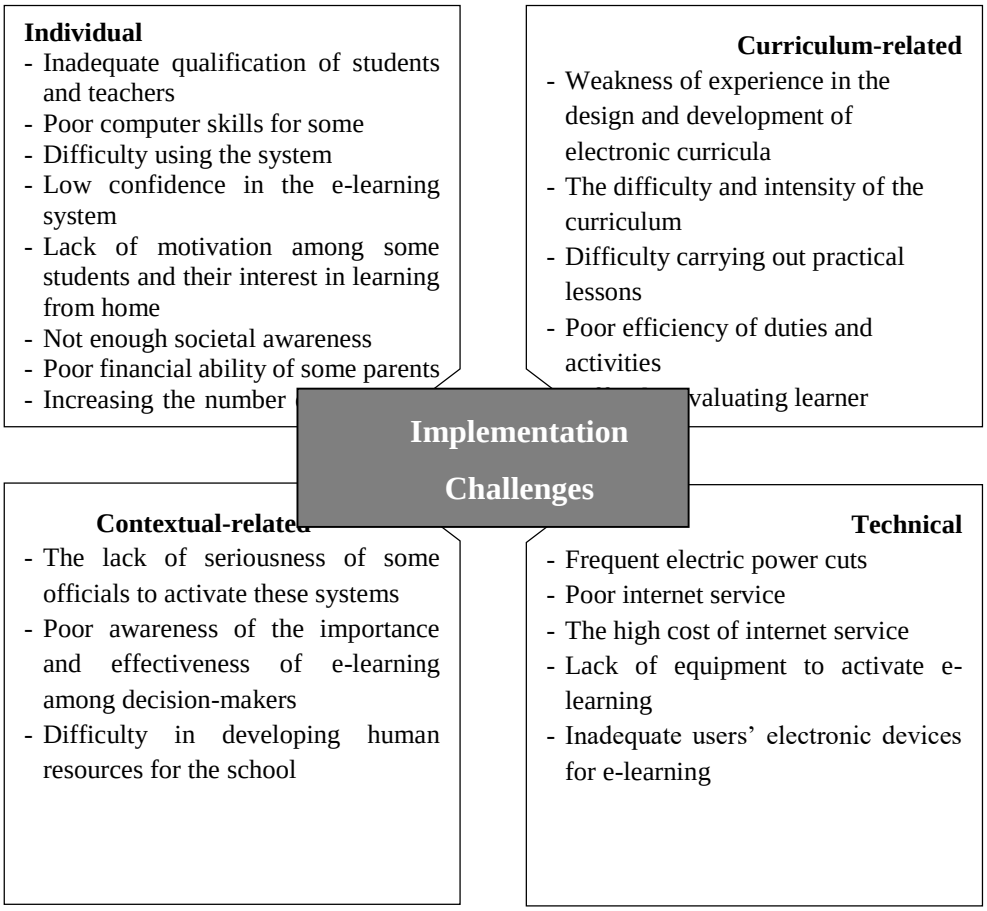
It is noteworthy that there is a great similarity between the content-related difficulties in the implementation of e-learning in the literature and the obstacles in this study when the results are compared. (Al-Azawei et al., 2016; Al-Shboul & Alsmadi, 2010; Alsabawy et al., 2013; Jhurree, 2005; Mahmud, 2010; Nawaz & Zubair Khan, 2012; Varlamis & Apostolakis, 2006). In addition, it is seen that learners have poor awareness and belief about the impact of the use of these systems on their own level.(Borotis S & Poulymenakou A, 2004; Isaac et al., 2019; Varlamis & Apostolakis, 2006). The country's weak infrastructure and the absence of a national e-learning network are also an obstacle to activating these systems (Al-Azawei et al., 2016; Rais et al., 2004). On the other hand, the weakness of the training and qualification aspect of human resources (Al-Azawei et al., 2016; Jhurree, 2005; Lassoued et al., 2020) is one of the most important challenges facing the activation of learning management systems in schools in general.

Finally, when the technical difficulties encountered in the implementation of e-learning are examined and compared with the results of the studies in the literature, it is seen that weak infrastructure and frequent power cuts come to the fore. (Al-Azawei et al., 2016; Aldowah et al., 2015; Alsabawy et al., 2013; Anene et al., 2014; Babattah & Ateş, 2022; Granville et al., 2000; Jhurree, 2005; Lassoued et al., 2020; Mahmud, 2010; Mutair, 2021; Rais et al., 2004). On the other hand, the lack of electronic devices for e-learning among students (Babattah & Ateş, 2022; Mutair, 2021) is the most important challenge facing the activation of learning management systems in schools in general.

CONCLUSION AND SUGGESTIONS

In this study, interviews were conducted with 28 participants who are principals and teachers of private secondary schools in Yemen, and the problems faced by that schools were identified in terms of implementing e-learning systems. The qualitative research method was used in the research. The research model is a case study. As a result of the study, it was noted that private secondary schools in Yemen face four major types of problems in front of implementing e-learning systems: individual problems, curriculum-related problems, content-related problems, and technical problems. In addition, it was revealed how to find solutions to these problems. The problems that private secondary schools face in front of implementing an e-learning system are summarized in Figure 1 and suggested solutions to these problems are summarized in Figure 2.

It is clear from Figure 1 that one of the most important individual problems is the weak ability of teachers and students to deal with these systems due to the difficulty of using sufficient qualifications for them, and their confidence in these systems is weak due to their lack of motivation, their lack of interest in studying from home, as well as the insufficient awareness of the community of the importance of the impact of e-learning. As Figure 2 elucidates, these challenges can be overcome by increasing societal awareness of the importance and usefulness of e-learning through holding awareness seminars and workshops, as well as training teachers and students to use and deal with these systems, and start even partially with e-learning systems to find motivation and remove barriers to their use. Figure 1 also indicates that the poor financial ability of parents to bear the cost of e-learning requirements, as well as the number of siblings in one family, poses a challenge to students' ability to use these systems in education. This problem which is expounded in Figure 2 can be overcome by synchronizing lessons between different classes during the day, as well as looking for support from development and educational institutions to provide good electronic devices at reasonable prices for



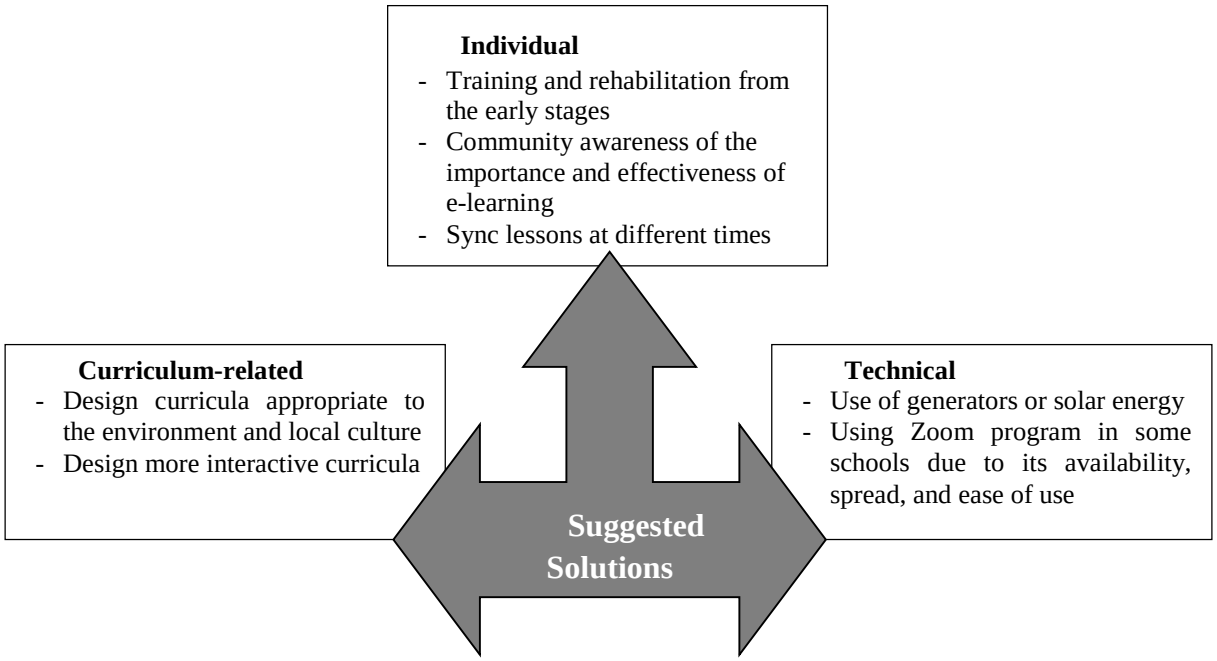
deserving families.

Figure 1: E-learning System Implementation Challenges

Figure 1 also indicates that the weak design of electronic curriculum, the difficulty of the curriculum and the intensity of its vocabulary, the application of

practical lessons, assignments, and activities, and the difficulty of evaluating students are major challenges to the activation of LMS systems. This can be overcome, as elucidated in Figure 2, by designing interactive, flexible, and scalable e-learning curriculum, as well as finding more accurate ways to properly assess students.

The lack of awareness of the importance of e-learning among school decision-makers, as well as the high operational budget of these systems, constitute a tangible challenge that leads to their lack of seriousness to activate these systems in their schools. As Figure 2 indicated, decision makers in schools can be convinced of the importance and impact of e-learning at the student level, as well as providing the budget and requirements for traditional lessons, whether for the teacher or the



school.

Figure 2. Suggested Solutions for E-Learning System Implementation

Figure 1 also expounded that technical challenges are among the biggest challenges facing the activation of learning management systems in Yemen in general, represented by frequent power cuts, weak and high cost of Internet service, lack of necessary equipment and insufficient devices for users. Figure 2 indicated that it was possible to overcome the problem of power outages by using private generators and solar energy systems, but these solutions are temporary and expensive. As for the Internet, it was possible to use the Internet via the cellular network, but it is very expensive. These problems can be largely overcome by the government's support for projects to repair the electricity systems in Yemen as well as improve the internet service in the country in general. The state, as well as civil society organizations, can support the provision of appropriate devices for e-learning for students.

According to the results, two main categories were identified based on the 13 metaphors mentioned by the participants. These two categories showed that the participants had a clear vision and a positive perception of e-learning in terms of its performance and how it works, as well as in terms of its benefits and impact. On the other hand, 3 of the participants have a negative view of e-learning imposed by reality in terms of the weak electricity and internet infrastructure in Yemen in general.

The recommendations that were extracted from this study can be summarized as follows:

- Holding awareness seminars and workshops on the importance and impact of e-learning.
- Conducting training courses for teachers and students on how to use and deal with e-learning systems.
- Designing modern, interactive, flexible, and upgradable electronic educational curriculum.
- Designing interactive applications for practical lessons and activities with accurate assessment methods.
- Awareness of decision-makers about the importance of e-learning and its scientific impact on the student, and financially on the school.
- The government has taken concrete steps to reform the country's electricity systems, as well as improve internet service and reduce its cost.
- Supporting the government and civil society organizations to provide electronic devices for e-learning for free or at reduced prices.

This study has some limitations, represented in the researcher's inability to conduct face-to-face interviews with the participants in this study, due to the researcher's inability to travel to Yemen due to the specificity of Yemen's current unstable situation and the high cost of travel. On the other hand, the researcher faced difficulty in conducting all the face-to-face interviews simultaneously over the Internet, due to poor internet service in Yemen and frequent power cuts. In addition to that the participants were unable to do so because of the cost of video calling via the Internet via the mobile phone network. The focus of the research sample was on private secondary schools only. For this purpose, the researchers propose three recommendations for future researchers. firstly, studies can conduct on e-learning that includes all Yemeni public and private schools of all categories. Secondly, studies can focus on establishing and building e-learning systems that fit the local environment with its current components in Yemen. Thirdly and lastly, studies can be planned on the transparent management of e-learning management systems and modern education.

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