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Identifying Challenges and Opportunities of Virtual Education from the Perspective of Experts

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A B S T R A C T

Objective: The need for changing educational methods and increasing the use of technology in education is increasingly felt every day. The purpose of this study was to identify the challenges and opportunities of virtual education in the country.

Methodology: This research employed a qualitative method (thematic analysis) and was applied in terms of its objective. The participant community in the study was selected based on specific criteria such as expertise, relevant publications, academic and non-academic experiences, etc. Thus, by reviewing the works of the expert community, 12 experts in the field of e-learning were identified as the research sample through purposeful sampling. The research instrument was semi-structured interviews, and the findings were validated and tested for reliability. Data analysis was conducted using thematic analysis with coding.

Findings: The findings revealed 52 open codes, 16 axial codes, and 2 selective codes for the challenges and opportunities of virtual education identified by the experts. Challenges included (infrastructural limitations, disruption in education, low engagement, teaching content, superficial learning, and lack of social interactions), and opportunities included (simultaneous study and work, time management, spatial independence, learning flexibility, increased digital literacy, enjoyment of learning, family confidence, cost-effectiveness of learning, and reduction of environmental stress).

Conclusion: It can be concluded that virtual education is an educational method that, like in-person education, has its advantages and disadvantages. Therefore, educational authorities can maximize benefits by strengthening opportunities and reducing challenges, especially when in-person education is not feasible.

Keywords: *Education and Learning, Virtual Education, Education, Opportunities, Challenges*

1 Introduction

Throughout their lives, humans have continuously engaged in learning and acquiring knowledge. With the advancement of technology, education has also evolved, keeping pace with technological developments and becoming more integrated with them. Hence, obtaining education is one of the fundamental needs of humans. It is evident that to live in today's advanced society, where information is constantly changing and evolving, one must stay informed; otherwise, one becomes unstable and isolated from society (Apostu et al., 2022). On the other hand, with the increasing population, society cannot cater to the educational needs of all individuals. Therefore, a strategy must be found to provide education for everyone at the lowest cost (Chang et al., 2022).

Moreover, formal methods of education, i.e., in-person classes, cannot remain the sole method of education for an extended period. Learners, due to financial and spatial limitations, are not always able to attend physical classes. Thus, in-person education is no longer the only method as it was in the past (Mystakidis et al., 2022). Additionally, the COVID-19 pandemic demonstrated that relying solely on in-person education is not always feasible. Conducting classes under such conditions was either impossible or posed significant risks for the participants (Gómez et al., 2021). Traditional education has recently incorporated facilities that are results of technological advancements, knowledge, and individual skills. In the late 1990s, the world embraced a significant transformation in the educational system known as virtual education. This transformation, due to its extensive technological capabilities and freedom from time and place constraints, presents a good solution to many traditional educational problems. Conventional learning can be costly and time-consuming; therefore, any technological or methodological advancements that can reduce costs, both financially and time-wise, are of great importance to many individuals, organizations, and industries (Kaplan et al., 2021). Consequently, these methods reflect the maturity of such education systems. Meanwhile, online education is rapidly advancing in the world of information technology (Ebrahimi et al., 2022).

Virtual education generally refers to any educational method that is not confined to a specific time and place and facilitates learning. In other words, virtual education does not require a specific location for the teacher and learner and occurs with the help of hardware and software tools (Mantovani & Castelnuovo, 2003). Alternatively, virtual education refers to distance education via the internet (i.e., e-learning) through local networks where the teacher and learner are separated (Sadeghi, 2019). Virtual education usually takes place in a learning environment where the teacher and student are in different locations and/or times. The course content is delivered through IT applications, multimedia, resources, the internet, video conferencing, etc. (Dung, 2020). Virtual education can facilitate access to necessary and relevant information for the course and, more importantly, create an interactive learning environment (Gross et al., 2023). It enables adaptive and interactive learning and reduces education costs while providing access to education at any time of day (Sinclair et al., 2016).

Research has been conducted on the challenges and opportunities of virtual education. Banisi et al. (2022) concluded that the advantages of virtual education include continuous learning without the need for the physical presence of students, the integration of new technologies into education, and drawing inspiration from them to enhance future education. It also provides opportunities for teachers and professors to rethink and update their knowledge. The development of educational tools and methods in this direction allows each individual to learn with their own resources at their convenience (Banisi et al., 2022). Hajizadeh et al. (2021) concluded that virtual education, due to its lack of time and space constraints and the potential for increased supervision, offers opportunities while also presenting challenges such as reduced mental health, the emergence and promotion of unethical education, disorder, and disruption in this type of education, and infrastructural weaknesses (Hajizadeh et al., 2021). Alborzi et al. (2021) found that non-constructive challenges included themes of teaching skills and education in the virtual space, virtual space equipment and infrastructure, teachers' interactions with families, and attitudes toward using virtual space. Constructive challenges included themes of educational opportunities and psychological opportunities as key aspects of virtual teaching challenges (Alborzi et al., 2021). Morina et al. (2024) found that five main themes include study characteristics, technological resources most used in university teaching, benefits of technology for learning, problems in using technology, and the valuation of virtual educational environments as challenges of virtual education (Moriña et al., 2024). Sadati et al. (2021) concluded that two main categories, "individual barriers to effective virtual learning," including personal characteristics and family factors, and "organizational management," including infrastructure provision, management and leadership,

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training and supervision, ethics and law, and evaluation, are the main themes and challenges of virtual education (Sadati et al., 2021). Masalimova et al. (2022) claimed that online learning has the potential to compensate for any limitations caused by pandemics. Distance learning is beneficial as it allows learning at any time and from any place, making it both successful and beneficial for learning. Staying at home is safer and less stressful for students during a pandemic. Distance learning addresses various physical and mental health concerns, including fear, anxiety, stress, and attention problems. Many schools lack sufficient infrastructure due to the rapid transition to online education during the pandemic (Masalimova et al., 2022). Thaheem et al. (2021) found no significant statistical difference in the individual and educational challenges faced by Pakistani and Indonesian teachers, whereas there was a significant difference in technological challenges faced by teachers (Thaheem et al., 2022).

Experts have highlighted that virtual education also has advantages and disadvantages. Virtual education requires certain prerequisites such as appropriate online infrastructure and digital classrooms, along with hardware and software tools (Sadeghi, 2019). Therefore, if the infrastructural measures for virtual education are not in place, its efficiency will be limited. The necessity of this research is evident as virtual education and its various dimensions must be addressed. In the future, due to unforeseen events such as the COVID-19 pandemic and the importance of this type of education, its significance will be more pronounced. Therefore, virtual education will be more discussed and different educational methods will likely move in this direction. The aim of this research is to identify the opportunities and challenges of virtual education from the perspective of experts.

2 Methods and Materials

This research employed a qualitative method (thematic analysis) and was applied in terms of its objective. The participant community in the study was selected based on specific criteria such as expertise, relevant publications, academic and non-academic experiences, etc. Thus, by reviewing the works of the expert community, 12 experts in the field of e-learning were identified as the research sample through purposeful sampling. The sample size was determined using the principle of theoretical saturation, meaning interviews continued until no new concepts emerged. Data analysis was conducted using thematic analysis with manual coding.

The research instrument was semi-structured interviews. The findings were validated and tested for reliability. The validation of the research questions was conducted by several experts familiar with the topic of virtual education, and initial question analysis was performed. Some suggestions and adjustments were made to the arrangement of the questions. For reliability, the text of three interviews was randomly selected, and the researcher, along with another experienced coder, re-coded the interviews. The reliability coefficient based on inter-coder agreement was 0.82. Initially, the main questions were asked of the participants, and they were requested to mention any other important questions related to virtual education. The questions were provided to them before the interviews to ensure better preparedness.

Participants were first selected for the interviews, and then the interview times were coordinated with them. Considering all participants were distinguished university professors, the interviews took approximately three months to complete. Each interview took about 50 minutes, depending on the extent of responses. Additionally, for further clarification of participants' statements, follow-up communications were made to ensure their exact meaning and concepts were captured accurately.

3 Findings and Results

The study involved 12 participants with a diverse range of demographic characteristics. The age of participants varied from 28 to over 45 years. Specifically, there were 2 participants aged between 28-33 years, 2 participants aged between 34-39 years, 4 participants aged between 40-45 years, and 4 participants over 45 years old. In terms of academic rank, the participants included 3 assistant professors, 5 associate professors, and 4 full professors. The experience in e-learning among the participants ranged from 4 to 25 years, with 1 participant having 4 years of experience, 3 participants with 11 years, 4 participants with 19 years, and 4 participants with 25 years. Regarding gender, the sample consisted of 8 males and 4 females.

In Table 1, the stages of open, axial, and selective coding are presented.

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Table 1

Stages of Open, Axial, and Selective Coding

Open Coding	Axial Coding	Selective Coding
• Strong Internet	• Infrastructural limitations	• Challenges of Virtual Education
• Appropriate communication equipment		
• Modern communication tools		
• Online support		
• Inequitable access in different regions		
• Parental and others' interference	• Disruption in education	
• Frequent internet disconnections		
• Problems for the educator		
• Problems for the learner		
• Inattention to education	• Low engagement	
• Lack of proper virtual supervision		
• Nature of virtual education		
• Volume of study material	• Teaching content	
• Mismatch of content with method		
• Curriculum		
• Evaluation and assessment of textbooks		
• Lack of interaction in education	• Superficial learning	
• Learning culture		
• Obligation-driven education		
• Ignoring assignments		
• Nature of virtual education	• Lack of social interactions	
• Lack of face-to-face presence		
• Absence of real-world experiences		
• Opportunity to study while earning	• Simultaneous study and work	• Opportunities of Virtual Education
• Ease of continuing education		
• Ease of job creation		
• Scheduling classes at desired times	• Time management	
• Self-management of the learning schedule		
• Education at repetitive times		
• Learning in non-specific locations	• Spatial independence	
• Simultaneous learning at the workplace		
• Studying during leisure time		
• Repeating the educational program at any time	• Flexibility in learning	
• Multi-dimensional learning		
• Facilitating learning		
• Increased learning time		
• Familiarity with new communication tools	• Increased digital literacy	
• Enhanced digital skills		
• Better use of multimedia skills		
• Applying digital literacy in life		
• Ease of learning	• Enjoyment of learning	
• Variety in learning		
• Departure from formal classroom rules		
• Learning while lying down and eating		
• Learning outside school rules		
• Reduced parental stress	• Family confidence	
• Easy access to the learner		
• Safe learning environment		
• Reduced educational costs	• Cost-effectiveness of learning	
• Lower educational expenses		
• Reduced conflicts among learners	• Reduced environmental stress	
• Fewer accidents and unforeseen dangers		

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The findings in Table 1 show that 52 open codes, 16 axial codes, and 2 selective codes were identified for the challenges and opportunities of virtual education by experts. The challenges included (infrastructural limitations, disruption in education, low engagement, teaching content, superficial learning, and lack of social interactions), and the opportunities included (simultaneous study and work, time management, spatial independence, flexibility in learning, increased digital literacy, enjoyment of learning, family confidence, cost-effectiveness of learning, and reduced environmental stress). The following sections present some of the experts' statements regarding these challenges and opportunities.

3.1 Challenges

3.1.1 Infrastructural Limitations

One of the key issues in virtual education is related to infrastructure, which plays a significant role in the quality of this education. Some participants believed that having a robust internet infrastructure and avoiding frequent disconnections are crucial for effective virtual education.

For example, one participant stated, "I was in an online class, and during the 90-minute lecture, the internet disconnected six times. It was so frustrating for me, and the students kept messaging that the video was not loading. This kind of educational method questions its quality (Participant 4)." Another participant mentioned, "Having up-to-date connecting devices, like a modern laptop, enhances class quality. During my lecture, my outdated laptop kept freezing, and I had to restart it several times. Such educational methods discourage learners (Participant 9)."

3.1.2 Superficial Learning

Some believe that only in-person education leads to deep learning, while virtual education cannot achieve this. For instance:

"In my opinion, the learner is not engaged in the teaching process and is usually distracted. This kind of education is superficial and does not result in real learning (Participant 3)." "In my view, virtual education cannot provide adequate learning because the student cannot fully engage with the education, and any surrounding distractions can divert their attention (Participant 11)."

3.1.3 Lack of Social Interactions

Some experts believe that virtual education is flawed due to the absence of face-to-face interactions. For example, some participants stated:

"Education is fundamentally about learning, but from a broader perspective, face-to-face interaction itself is a form of learning. When you are in a physical classroom, observing the movements of the other person can teach you things that might be effective in learning, which is not present in virtual education (Participant 8)." Another expert mentioned, "In virtual education, we teach one-sidedly, and it's unclear what the learner is doing. There is no interaction between us (Participant 10)."

3.1.4 Teaching Content

The content and volume of textbooks have always been significant topics in teaching and learning. Each country's curriculum might vary depending on cultural conditions. Some participants stated that in virtual education, a lot of time is needed to cover all the materials. For instance:

"If your teaching content is, for example, philosophy, it cannot be easily taught through virtual education. Philosophy has complexities that are better understood in a classroom with discussion (Participant 12). I believe the volume of books should be relatively low for virtual education to cover the content effectively (Participant 7)."

3.2 Opportunities

3.2.1 Simultaneous Study and Work

Studying alongside working has always been a reality. Today, with the desire for independence and the need for income, employment has become more focused. Students have always sought to study while earning. Some experts believe that virtual education can meet the job market demands and that having a job while studying is no longer a concern. Some participants stated:

"I believe that in the future, virtual education will be a choice for many because the need for income and the lack of restrictions in education are good features of this method (Participant 4). I think being able to study and work simultaneously serves the job market and increases skills (Participant 1)."

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3.2.2 *Increased Digital Literacy*

Having digital skills is indispensable today as both the job market and other life domains depend on it. Schools and universities are suitable places for learning and becoming familiar with digital literacy. Learners can get acquainted with software and virtual education methods while learning. Participants believed:

"Virtual education allows learners to engage with electronic and virtual tools. Sometimes, during teaching, I faced problems executing the virtual program, and some students noticed and helped me fix it (Participant 8). Learners learn and teach simultaneously. Today, virtual education has shown this benefit well; you can be both a learner and a teacher (Participant 6)."

3.2.3 *Enjoyment of Learning*

Another advantage of virtual education is the enjoyment of learning. Enjoying learning helps you better understand the material and become more eager to learn. For example, some participants believed:

"My student said virtual education is a kind of enjoyment because he sees it as a friend and helper. It allows me to study and work simultaneously, which is enjoyable for me (Participant 10). Many students after the COVID-19 pandemic wished that virtual education would always be available because it reduces stress and fatigue in class, making learning more voluntary and enjoyable (Participant 1)."

4 Discussion and Conclusion

Along with the rapid changes in the world in all areas, education has also been at the forefront. Today, the necessity of virtual education has become more pronounced. The primary aim of this study was to identify the challenges and opportunities of virtual education in the country. The findings revealed 52 open codes, 16 axial codes, and 2 selective codes for the challenges and opportunities of virtual education identified by experts. The challenges included (infrastructural limitations, disruption in education, low engagement, teaching content, superficial learning, and lack of social interactions). These findings are consistent with studies such as Alborzi et al. (2021), which found that non-constructive challenges include themes related to teaching skills and education in virtual space, virtual space equipment and infrastructure, teachers' interactions with families, and attitudes towards using virtual space (Alborzi et al., 2021).

To explain the results, it should be noted that virtual and electronic education gained significant attention during the COVID-19 pandemic, although virtual education had been around before. Therefore, in recent years, virtual education has become the dominant method in schools, universities, and other educational organizations. During this short period, societies and institutions that lacked the necessary hardware and software infrastructure faced more challenges. Thus, it can be concluded that the higher the readiness and level of development in infrastructure, the fewer the challenges faced by educational systems.

On the other hand, it should be noted that challenges vary in different societies. Sometimes a challenge in one educational system might be considered an advantage in another, and vice versa. For example, in some educational systems, rigor and strictness are positive attributes, which may be reduced in virtual education for various reasons. Therefore, challenges in different societies and educational systems vary and are evaluated based on the norms and culture of the educational systems.

Another finding of this study was the opportunities of virtual education, which included (simultaneous study and work, time management, spatial independence, flexibility in learning, increased digital literacy, enjoyment of learning, family confidence, cost-effectiveness of learning, and reduced environmental stress). These findings align with studies such as Banisi et al. (2022), which concluded that the advantages of virtual education include continuous learning without the need for the physical presence of students, the introduction of new technologies into education, drawing inspiration from them to enhance future education, and providing opportunities for teachers and professors to rethink and update their knowledge (Banisi et al., 2022). Hajizadeh et al. (2021) concluded that virtual education has opportunities due to the lack of time and space constraints and the potential for increased supervision (Hajizadeh et al., 2021). Masalimova et al. (2022) claimed that online learning has the potential to compensate for any limitations caused by pandemic conditions. Distance learning is beneficial as it allows learning at any time and from any place, making it both successful and beneficial for learning (Masalimova et al., 2022).

In explaining the results, it should be noted that, like in-person education, which has its advantages and challenges, virtual education is similar. Many researchers predict that virtual education is suitable for the future because it provides

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the opportunity for everyone to study under any conditions and avoids most of the limitations of in-person education. Thus, in this method, limitations are minimized, and learners can receive education more easily and save time (Joseph et al., 2022).

The limitations of this study include the sample of experts who were knowledgeable in the field of virtual education, meaning many other individuals and experts were not involved in this research. Another limitation is that the study's results were confined to a specific community, so generalization should be approached with caution. Another limitation was related to the research methodology. Due to financial and time constraints, the researcher could not validate the results. Therefore, future researchers are advised to use mixed qualitative/quantitative methods and include diverse experts. It is recommended that the country's educational system use the challenges identified in this study to reduce the problems of virtual education. Training teachers and professors and conducting in-service training courses can be effective measures to reduce issues related to virtual education and improve time management and teaching. Additionally, the identified advantages can be strengthened to further highlight the benefits of virtual education.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

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Declaration of Interest

The authors report no conflict of interest.

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Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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