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Identifying New Challenges and Emerging Issues in the Virtual Space during the COVID-19 Pandemic: A Systematic Review Based on Wright's Model

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A B S T R A C T

The present study aimed to identify the new challenges and emerging issues in the virtual space during the COVID-19 pandemic in order to provide a comprehensive picture and perspective of this area. This qualitative research utilized a systematic review method. The research population consisted of all articles (179 articles) presented in the last five years on the challenges of virtual space and related fields in specialized and scientific databases. The sample for the study included 20 articles, selected purposefully based on thematic monitoring and theoretical saturation of the data. The research data were gathered through qualitative analysis of the documents under study. Through data analysis, the new challenges and emerging issues of the virtual space during the COVID-19 pandemic were categorized into 4 dimensions, 11 factors, and 56 categories. These included the dimension of socio-cultural challenges (identity disorder, value conflicts, social isolation); environmental challenges (changes in school work culture, transformation of organizational and product competitive advantages, emergence of educational inequities); ethical challenges (violation of privacy, cyber harassment, distortion of informational content); and educational challenges (incomplete teaching of laboratory courses, weakened sense of educational presence, educational frustration).

Keywords: *virtual space, socio-cultural challenges, environmental challenges, ethical challenges, educational challenges, COVID-19*

1. Introduction

The global spread of the coronavirus led to significant changes in social and organizational interactions (Bacq et al., 2020). Undoubtedly, the virtual space played a crucial role as an effective tool in the social life and health of citizens during this pandemic. With the increased use of technology and communications during this crisis, the virtual space emerged as a communication and interaction platform in modern societies, playing a significant role in the health of citizens throughout the global COVID-19 crisis, also known as the coronavirus pandemic (Ganji et al., 2024). With the emergence and spread of the coronavirus, the virtual space became a primary source of information, communication, and even entertainment for people worldwide (Navabi Nejad, 2020).

The impacts of COVID-19 are nearly incalculable. This disease caused profound social, economic, and educational problems (Kissler et al., 2020). For those working in an educational context, the immediate impact of COVID-19 was the forced closure of schools and universities in the early days. In many countries (over 150 countries), educational centers and schools were closed, and with growing concerns, a large number of educational institutions and universities

worldwide suspended or canceled their educational activities (Sahu, 2020). According to a UNESCO (2020) report, more than 1.5 billion learners in 165 countries around the world turned to online education due to the closure of universities and educational centers caused by COVID-19 (Hsu et al., 2021).

The recent developments in information technology have led to widespread internet penetration among the general population worldwide, particularly in developed countries. Access to the internet has expanded to such an extent that it is now used to meet daily life needs. The rapid growth of information technology worldwide has made the internet accessible to many people, and this progress is also well felt in developing countries, including Iran (Bagherianpour, 2019). The lifestyle of global citizens today has been significantly influenced by modern information and communication technologies. This influence is so profound that many people now rely on such technologies for even the simplest and most mundane tasks. The widespread use of these technologies has made their absence problematic and confusing for individuals, as modern information and communication technologies have become deeply integrated into human life. The emergence and spread of information and communication technologies (ICT) have accelerated global transformations centered on information and knowledge (Mardani et al., 2018). In the development of contemporary societies, the role of ICT is highly significant and noteworthy, affecting various social, cultural, and economic dimensions (Mehraban & Mazaheri, 2016). Terms such as e-commerce, e-government, e-learning, and e-society emphasize the necessity of using and adopting ICT in various fields, suggesting that information technology, particularly after the COVID-19 pandemic, is one of the tools that, with proper, precise, and rapid adoption, can lead to success in today's competitive landscape. Today, information networks, resulting from the development of technology, play a crucial role in globalizing industries and services. ICT and the virtual space, as network technologies, have created new services that have led to increased interaction between people compared to before the pandemic (Arianpour & Mehrabi, 2016).

Regarding the etymology of the term "virtual space," it is important to note that "virtual space" is often synonymous with "cyberspace," as the translation of the word "cyber" is not entirely accurate. Although the term "virtual" is sometimes used as its equivalent, "cyber" refers to real and observable but intangible subjects, which cannot be equated with "virtual," which refers to mental and conceptual subjects. Cyberspace is the same virtual and infinite space that exists through the interconnection of computer networks. An online system is an example of cyberspace, where users can communicate with each other via computers. Unlike the physical world, in cyberspace, physical movement is not necessary, and all actions and reactions occur through keyboard presses or mouse movements. Based on various definitions of cyberspace, it can be said that cyberspace is an environment composed of interconnected communication systems and networks capable of exchanging data, storing, and disseminating information. Therefore, it is important to understand that the term "virtual space" refers to cyberspace and its associated concepts, not to the mental and conceptual subjects evoked by the term "virtual" (Karimi Nia et al., 2021).

The virtual space is a new generation of social relationships that, despite its relatively short history, has managed to firmly establish itself in people's lives. Many people of various ages and social groups come together in the virtual space, communicating with each other across great physical distances in the real world (Navabi Nejad, 2020). Today, methods of communication with others through the internet have increased. Email, short messages, chat rooms, websites, and online games have become ways to expand and maintain social relationships. Nearly 400 million people worldwide use the internet daily, and one of the primary uses of the internet is to establish social communication with others. The main disadvantage of internet communication is that it is primarily text-based and thus lacks the visual and auditory cues present in face-to-face interactions (Abotalebi, 2023).

In today's world, and especially after the COVID-19 pandemic, the internet and virtual space have influenced the identity of adolescents and young people in various intellectual and moral dimensions, creating a strong link between social harms and information technology and globalization. Excessive use of the internet leads to psychological and intellectual dependency, causing some users to retreat into an unrealistic world where they spend most of their time (Kissler et al., 2020). Research shows that a high percentage of adolescents and young people use the internet for activities such as making friends, playing games, and communicating with others. The attractive and seemingly intimate environment of internet sites causes users to engage in them without noticing the passage of time, and they may find these activities more enjoyable than interacting with their parents, resulting in disruptions in their social interactions, behavior, and life (Huang et al., 2020).

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Given that the global community has been facing the phenomenon of the coronavirus for several years, and this virus has affected all aspects of human life, examining its dimensions and challenges in various fields is a necessary research endeavor. To this end, various studies have explored the dimensions of COVID-19, with its challenges receiving particular attention. Therefore, this study seeks to investigate the new challenges and emerging issues in the virtual space during the COVID-19 pandemic through a systematic review. Reviewing the literature and synthesizing the findings in this area can provide a comprehensive perspective, aiding theorists and researchers in this field and fostering a deeper, more meaningful understanding of the subject.

2. Methods and Materials

2.1. Study Design and Participants

The present study is qualitative and employs a systematic review to analyze studies related to identifying the emerging challenges and issues of virtual space during the COVID-19 pandemic. The studies evaluated in this method must be published online and based on fieldwork and research. Therefore, the research domain includes all reputable scientific articles on the emerging challenges and issues of virtual space during the COVID-19 pandemic. Given the nature of the research, all selected articles were chosen from studies conducted after the onset of the coronavirus pandemic. To gather the necessary information, a researcher-designed worksheet was used to report and record information from the primary research studies. In this study, the seven-step model by Lee, Wright, Rukavina, and Pickering (2008) was used for analyzing the findings.

To ensure proper coding, four evaluators were employed to recode the findings, using Scott's (2012) method for validation. In this study, the inter-rater agreement was calculated at 75, indicating a 75% agreement among the evaluators in coding.

The following section summarizes the first five steps of the model, tailored to the research subject:

Step 1: Formulating the Research Question

The first step for researchers is to focus on the research questions. The study questions and their parameters are outlined in Table 1.

Table 1

Research Questions and Parameters

Parameter	Formulation of Question
What (Study Question)	What are the dimensions and components of the emerging challenges of virtual space during COVID-19 in the literature?
Who (Study Population)	Several databases were reviewed in this study (Scopus, Emerald, Sage, Scientific Information Database, Science Direct, ProQuest, SpringerLink, WorldScientific, Taylor & Francis, Google Scholar, and ERIC).
Findings & Results	The studies analyzed were those whose findings were related to identifying the emerging challenges and issues of virtual space during COVID-19.
When (Timeframe)	The studies reviewed in this research were from 2019 onwards.
How (Data Collection Method)	A systematic review method was used. Studies were selected based on criteria, and inappropriate studies were excluded from the process.

Step 2: Defining the Protocol or Agreement for Conducting the Review

At this stage, the researcher seeks to minimize bias by defining the review methods before retrieving the relevant literature. The researcher initially identifies the level of studies. This stage involves judging the relevance of the studies to the knowledge needs, which requires the development of criteria for selecting and categorizing the studies.

a) Inclusion Criteria:

1. Articles published on identifying the emerging challenges and issues of virtual space during the COVID-19 pandemic.
2. Research studies must report sufficient data and information related to the research objectives, ensuring the adequacy of the study for analysis in this article, including relevant codes for the emerging challenges and issues of virtual space during COVID-19.
3. Research studies must undergo peer review by expert evaluators and be fully published online or in print.
4. **b) Exclusion Criteria:**
5. Studies that did not report sufficient information on the research objectives, or that only quantitatively examined virtual space challenges during COVID-19 with other variables.

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6. Studies lacking the necessary scientific quality and published in non-reputable journals or conferences.

Step 3: Literature Search

This stage focuses on searching for sources relevant to the primary research need. Therefore, all reputable scientific articles were identified through keyword searches in domestic databases, including Google, SID, Normagas, Magiran, the Comprehensive Humanities Portal, and the Iranian Research Institute for Information Science and Technology (IRANDOC), as well as in foreign databases such as Scopus, Emerald, Sage, Scientific Information Database, Science Direct, ProQuest, SpringerLink, WorldScientific, Taylor & Francis, Google Scholar, ERIC, and Wiley. Relevant sources were retained while irrelevant ones were discarded. To improve the quality of the search, two individuals with full familiarity with search methods and information resources conducted independent searches. Additionally, three experts in virtual space challenges oversaw the entire process. This research relied on both domestic and foreign sources, specifically published scientific research articles, as these have undergone expert review processes, reflecting the credibility of their findings.

Step 4: Extracting Research and Data Sources

In this step, a standardized form was used, which included sections such as the source (journal name, article title, and author), the purpose (objective of the study), methodology, and overall results. To select appropriate sources, the relevant keywords were searched in each database. It should be noted that the total number of studies identified was 189 (both Persian and English), of which, after reviewing all and considering the exclusion criteria regarding content and credibility, the results of 20 studies were finally selected for analysis. Table 2 provides an example of how various databases and articles were reviewed.

Table 2

Search Strategy and Inclusion/Exclusion Criteria of Studies

Final Findings	Exclusion Criteria for Studies	Initial Findings	Second Filter	First Filter	Search Strategy	Database
17	Content Irrelevance	182	Invalid article, Book chapter & Thesis	Article title, Abstract, Keywords /2019 to present	Components related to new challenges of virtual cyberspace in the era of Corona	Foreign databases (Scopus, Emerald, Sage, Scientific Information Database, Science Direct, ProQuest, SpringerLink)
3	Content Irrelevance	7	Invalid article, Book chapter & Thesis	Article title, Abstract, Keywords /2016 to present	Components related to new challenges of virtual cyberspace in the era of Corona	Domestic databases (Comprehensive Humanities Portal, Normags, Magiran, etc.)

Step 5: Quality Evaluation

Every study must have acceptable validity and objectivity, including qualitative studies and systematic reviews. A comprehensive search will lead to the discovery of many relevant studies; however, since not all of these studies possess sufficient quality, each source must be evaluated based on the inclusion and exclusion criteria established in the research, using appropriate tools. Only studies with the required quality are analyzed. In this study, a checklist with various criteria was used to evaluate the quality of each primary study as high, medium, or low. The goal of this evaluation was to enhance the validity of the study by using an appropriate checklist and excluding low-quality studies from the research process. Table 3 provides an example of the checklist used to evaluate 5 studies based on the model of Carlson et al. (2007).

Table 3

Sample Checklist for Evaluating 5 Studies Based on Carlson et al. (2007)

Row	Criteria	Study 1	Study 2	Study 3	Study 4	Study 5
1	Sampling strategy	✓	✓	✓	✓	✓
2	Data collection method	✓	-	✓	✓	✓
3	Data analysis method	✓	-	✓	✓	✓
4	Alignment of research design	✓	✓	✓	✓	✓
5	Clarity of findings	✓	✓	✓	✓	✓
6	Appropriateness of research outcome	-	-	✓	-	✓
7	Consistency between paradigms and methods	✓	-	✓	✓	✓

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8	Quality level (high, medium, low)	High	Low	High	Medium	High
9	Notes		Needs third researcher evaluation			

At this stage, the extracted sources were reviewed by at least two independent researchers based on the criteria outlined above. If a study was rejected, the reason for its rejection was stated. In cases of disagreement between the two researchers, a third evaluator was considered as an adjudicator.

3. Findings and Results

In this section, steps six and seven of the Lee Wright et al. (2008) model, relevant to the present study, are addressed.

Step 6: Processing, Synthesizing, and Interpreting in the Form of Tangible Outputs

Based on the findings of the study and in alignment with the aforementioned criteria, all components and indicators were initially extracted through an open coding process. Table 4, derived from the research findings, compiles related studies across three sections: researchers, year of publication, and mentioned indicators and components. These studies are numbered according to their year of publication, as detailed below.

Table 4

Emerging Challenges of Virtual Space for Learners during the COVID-19 Era

Row	Researcher(s)	Indicators and Components of Emerging Virtual Space Challenges during COVID-19
1	(Rossetti & Daziano, 2024)	Social disconnection, psychological challenges, increasing importance of individual over society, low interaction between educational management and staff, weakening of emotional connections in virtual education.
2	(Ganji et al., 2024)	The role of the family as a teacher, importance of direct and indirect supervision in family upbringing, high health maintenance costs, jeopardizing peace of mind, combination of physical, psychological, and social issues, reduction in physical jobs and endangering job identity, change in customer persona in organizational products.
3	(Szabzon et al., 2024)	Social deprivation for specific groups, threat to public welfare, particularly for low-income groups, household stress and loss of income, limited device access, connection issues, lack of remote support specialists, dissemination of false and alarming information regarding the pandemic.
4	(Jooss et al., 2022)	Challenges in managing spatial, temporal, cultural, and linguistic distances, reduction in social empathy, identity theft in virtual space, misuse of user data concerning COVID-19 restrictions, spread of viruses and malware, one-dimensional education.
5	(Bacq et al., 2020)	Harm to traditional businesses, increased emphasis on the individual over society, merging organizational jobs into remote work activities, uniformity in organizational activity assessment tools, cessation of workshop projects, change in customer persona in organizational products.
6	(Perri et al., 2022)	Less choice, more control, weakened empowerment, increased consideration of power relations, violence, childcare responsibilities, diversification of organizational activity tools, insufficient support for social service delivery platforms, varying staff capabilities in fulfilling assigned tasks in virtual environments.
7	(Treter et al., 2021)	Economic turmoil, severe changes in daily life, reduced conflict management within families, less personal space and time alone, individual anxiety and stress due to the pandemic, increased conflict, mass phishing scams in social media, emotional and intellectual disconnection between parents and students.
8	(Shafran et al., 2021)	Anxiety disorders, creation of cognitive biases, intolerance of ambiguity, easing of social distancing via virtual communication, weakened corporate social responsibility, budget allocation discrimination, spread of viruses and malware, user data misuse concerning COVID-19 restrictions.
9	(Hsu et al., 2021)	Increased anxiety, depression, and stress, merging organizational jobs into remote work activities, variation in product market types, cessation of workshop projects, inequalities in available virtual infrastructure, varying staff abilities in fulfilling virtual tasks, stigmatization related to the pandemic, reduced social empathy in virtual education.
10	(Bogucki et al., 2021)	Uncertainty about the future, disruption of daily life and coping strategies, increased or lack of contact with others, voluntary quarantine from family as essential worker or due to vulnerability, difficulty in accessing food, shelter, and medical supplies, economic and employment concerns, childcare challenges.
11	(Yu et al., 2023)	Changes in social relations in virtual environments, undermining family values due to the blurring boundary between work and home, increasing conflicting social demands, diversification of organizational tools, change in competitive characteristics of organizations, low interaction between educational management and staff.
12	(Singh & Meena, 2022)	Poor internet connection, lack of proper electronic devices, absence of a conducive educational environment at home, low ICT knowledge among students and teachers, children's access to inappropriate content, cyber harassment, inability to use educational field trips, lack of standardized electronic content.
13	(Nakanishi et al., 2021)	Long-term physical disorders, cognitive disorders, and mental health issues, limited family visits, changes in social relations in virtual environments, easing of social distancing via virtual communication, reduced social empathy, budget allocation discrimination, identity theft in virtual space.
14	(Hajizadeh et al., 2021)	Declining mental health, promotion of unethical values, emergence of social harm, increase in physical harm, decrease in the quality of education, family conflicts, increase in non-productive student behavior, academic decline, teacher burnout, educational inequality, ineffective assessment, technical failures in networks, unsuitable home environments for education,

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		lack of strategic virtual education programs, economic family problems, limitations in human interaction, lack of technology knowledge and acceptance, insufficient virtual content, technological determinism.
15	(Rashedi et al., 2022)	Reduction in physical jobs and endangering job identity, challenges to religious identity, uniformity in organizational activity assessment tools, weakened corporate social responsibility, use of multiple identities during COVID-19.
16	(Chen et al., 2020)	Intra-family conflicts, generational differences in virtual space acceptance, increasing distrust and collective skepticism, change in organizational competitive traits, variation in product market types, inability to use educational field trips.
17	(Moon, 2020)	Challenges in agile adaptive approaches, transparency policy in risk transfer, voluntary citizen collaboration, intra-family conflicts, increasing conflicting social demands, misuse of anonymity in virtual meetings, biased information about vaccination, polarization, lack of standardized electronic content.
18	(Mirhosseini, 2021)	Disrupted life, health and hygiene-based challenges, increased control and supervision of women's daily lives, occupational and domestic challenges, suspension of normal life, persistent fear and stress, frustration, absence of educational and service organizations, additional caregiving responsibilities, lack of autonomy over one's body and health, intervention in women's affairs, loss of female space, return to traditional domestic tasks, transfer of professional responsibilities to the home.
19	(Nabipour & Baratali, 2021)	High costs and lack of equipment, inability to address all student issues, lack of family control, lack of communication among students, lack of seriousness in class, challenges in teaching methods.
20	(Fathi et al., 2020)	Psychological turmoil and negative emotions, work pressure, lack of mental health professionals and psychological skills, lack of adequate preparedness to deal with the disease, lack of specialized knowledge, job conflicts, reduced interpersonal relationships, coronavirus stigma, family conflicts, frustration due to the nature of the disease.

Step 7: Presentation of Synthesis Results

In this stage, researchers must present the outcomes that emerge from the synthesis process. To effectively present the findings, it is essential to consider different audiences. At this stage, researchers use visual aids (charts, images, and tables) to present their findings. Initially, in the synthesis process, the features, elements, and components of the emerging challenges of virtual space during the COVID-19 pandemic are extracted. This begins with identifying descriptions of all components through an open coding process. In the next step, the goal is to integrate all scientific findings into a specific topic and reach a unified coherence. The presentation of synthesis results involves placing the open qualitative codes together, followed by recoding, combining overlapping items and semantically related concepts, and extracting components (axial codes). Subsequently, all indicators of the emerging challenges of virtual space during the COVID-19 pandemic are categorized based on a common concept through axial coding. This process led to the identification of four dimensions (selected codes), with the results of axial and selected coding presented in Table 5.

Table 5

Dimensions of Emerging Challenges in Virtual Space during the COVID-19 Pandemic

Selected Code	Axial Code	Open Code	Coded Articles
Socio-cultural Challenges	Identity disruptions	Reduction in physical jobs and the endangerment of job identity	[15], [2]
		Intra-family conflicts	[16], [17]
		Changing social relations in the virtual environment	[11], [13]
		Increasing importance of the individual over society	[5], [1]
		Development of technological determinism	[8], [14]
		Cultural homogenization and totalitarianism	[11], [17], [18]
	Value conflicts	Challenges to religious identity	[15], [18]
		Generational differences in acceptance and rejection of virtual space	[7], [16], [19]
		Undermining family values by weakening the boundary between work and family	[7], [11]
		Increasing conflicting social demands	[17], [11], [1]
		Decline in socialization	[16], [11], [1]
	Social isolation	Easing of physical social distancing via virtual communication	[8], [13]
		Reduction in social visits	[7], [16], [19]
		Decline in social participation in collective processes	[1], [9], [13]
		Decline in social empathy	[4], [13]
		Growth of distrust and collective skepticism	[16], [19]
		Weakening of teamwork and collaboration	[3], [6], [19]
Environmental Challenges	Changes in school work culture	Reduction in collective activities among teachers and students	[3], [13], [15]
		Weak social responsibility in educational activities	[8], [1], [15]
		Merging education-related jobs into remote work	[5], [9], [15]
		Uniformity of assessment tools in schools	[5], [15]

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Emerging educational inequities		Inequality in access to basic virtual infrastructure	[4], [5], [8], [13]
		Discrimination in allocation of virtual education budgets	[8], [10], [13]
		Weak supervision of teachers' activities	[5], [8], [15]
		Weak support for student social service platforms	[1], [3], [12], [14], [30]
Ethical Challenges	Privacy violations	Identity theft in virtual space	[13], [4]
		Use of multiple identities during the pandemic	[4], [15]
		Misuse of user data concerning COVID-19 restrictions	[7], [4]
		Promotion of surveillance of private lives	[10], [12]
		Children's access to inappropriate content	[17], [14], [12]
Cyber harassment		Mass phishing scams in social media	[7], [12], [15]
		Use of public spaces for deceptive relationships	[11], [12]
		Spread of viruses and malware	[4], [8], [18]
		Threatening messages for virtual extortion	[18], [12], [20]
	Distortion of informational content	Spread of false and alarming information regarding the pandemic	[17], [10], [3]
		Stigmatization of individuals related to the pandemic	[3], [9], [11]
		Changing attitudes through rumors	[12], [18]
		Promotion of corruption through minors' access to informational environments	[1], [3], [4], [15]
		Misuse of anonymity in virtual meetings	[3], [17], [20]
		Biased information about vaccination and polarization	[12], [17]
Educational Challenges	Incomplete teaching of laboratory courses	Inability to use field trips	[16], [12], [1]
		Cessation of workshop projects	[5], [9], [12]
		Inability to conduct laboratory projects	[5], [14], [16]
		Lack of standardized electronic content	[4], [1], [12], [17]
		Weakening of student collaboration in the virtual environment	[12], [18]
	Weak sense of educational presence	Weak learner responsibility in virtual education	[19], [17]
		Inability to establish proper classroom communication	[16], [20]
		Reduced focus in virtual classes	[16]
		Low interaction between educational management and staff	[1], [11]
		One-dimensional education	[4], [21]
	Educational frustration	Intellectual and emotional disconnection between parents and students	[7], [17], [19]
		Increased educational anxiety	[3], [16], [17]
		Educational isolation	[17], [2], [20]
		Weakening of emotional connections in virtual education	[1], [17]
		Decline in social empathy in virtual education	[3], [1], [9]

4. Discussion and Conclusion

The internet and virtual space, particularly after the COVID-19 pandemic, have brought about numerous challenges and issues in various dimensions. Excessive and improper use of the internet can lead to psychological and mental dependence, with some users seeking refuge in an unrealistic virtual world. Additionally, in educational, organizational, and ethical aspects, the pandemic has introduced new challenges and harms, which have been addressed in various studies. The present research aimed to synthesize and provide a comprehensive overview of these elements by reviewing related studies. Based on the process and outcomes of the systematic review, four main categories of challenges were identified: educational challenges, ethical challenges, socio-cultural challenges, and organizational-management challenges. These are explained in detail below.

The educational dimension of emerging challenges in the virtual space during the COVID-19 era primarily addresses the shift to online schooling and its impact on education systems. The educational aspect includes understanding the platform of instruction (educational analysis), learner needs (audience analysis), and learning objectives (goal analysis). This dimension also encompasses the design and strategy of blended learning. The shift from in-person to online education during the pandemic led to several challenges. The challenge of incomplete teaching of laboratory courses highlighted the difficulties in delivering laboratory and project-based courses, as well as the inability to conduct educational field trips and workshop projects. The challenge of a weakened sense of educational presence refers to the

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diminished sense of presence in the virtual environment, resulting in reduced concentration and lower educational interaction. The challenge of educational frustration stems from educational isolation and the inability to adapt to virtual education, which is largely driven by decreased social empathy and increased educational anxiety in virtual settings. These findings align with prior research (Hsu et al., 2021; Perri et al., 2022; Szabzon et al., 2024), who focused on the educational challenges of virtual space during the pandemic.

Socio-cultural challenges refer to the emerging harms and issues in the virtual space during the COVID-19 pandemic, primarily targeting aspects such as identity, values, and social adaptation. Identity disruption in the virtual space during the pandemic is linked to reduced physical jobs, endangering job identity, intra-family conflicts, changing social relations in virtual environments, increasing emphasis on the individual over society, and the development of technological determinism. The challenge of value conflicts refers to the emergence of conflicting values in virtual space, stemming from conflicting familial and social demands and the shrinking boundary between professional and personal life. The challenge of social isolation addresses the shift from in-person social interactions to online communication, highlighting the reduction in social visits, social participation, empathy, trust, and collaboration. These findings are consistent with previous findings (Fathi et al., 2020; Nakanishi et al., 2021; Shafran et al., 2021), who also examined the socio-cultural impacts of the virtual space during the pandemic.

Environmental challenges in the virtual space during the COVID-19 pandemic focus on the surrounding context of educational changes. These challenges include the shift in school work culture from collaborative to individual and remote work and the emergence of educational inequities. This dimension emphasizes the challenges related to changes in educational characteristics in students' environments, such as merging remote jobs, blurring the boundary between work and personal life, unequal access to basic virtual resources, discrimination in the allocation of organizational budgets for virtual education, and weak supervision of teachers' activities. Educational inequity, due to the unequal distribution of government budgets and lack of basic virtual resources, was also identified as a major issue. These findings are consistent with previous research (Perri et al., 2022; Rashedi et al., 2022; Singh & Meena, 2022).

Ethical challenges in the virtual space during the pandemic refer to the issues that affect individuals' ethical perspectives and behaviors. The main ethical challenges identified include privacy violations, cyber harassment, and the distortion of informational content. These challenges manifest in various forms, such as identity theft, emotional extortion, and threatening messages. The distortion of informational content focuses on the spread of false and alarming news regarding the pandemic, defamation related to the pandemic, and changes in individuals' attitudes through misinformation. Privacy violations include identity theft in virtual space, the use of multiple identities during the pandemic, misuse of user data related to COVID-19 restrictions, and the promotion of a surveillance mentality in personal matters. The findings in this section are largely drawn from prior research (Bogucki et al., 2021; Fathi et al., 2020; Ganji et al., 2024), which also highlight privacy violations and virtual threats as key ethical challenges during the pandemic.

Despite all the challenges COVID-19 posed to various aspects of educational systems, it also offered several positive opportunities. If utilized correctly, these opportunities could far outweigh the challenges. The pandemic taught a lesson in empathy and reminded education authorities that with the advancements in modern technology, new tools for promoting educational equity must be embraced. Teachers learned to step beyond the traditional approaches they were accustomed to and consider new methods and models of teaching as complementary to their existing practices. Finally, it would be fitting to reference the perspective of Watermeyer et al. (2020), who stated: "The shift to online education during the COVID-19 pandemic should be seen as a step toward the professionalization of schools." This shift in educational approach can be viewed as a pathway toward increasing educational equity and a crucial step in preparing the groundwork for the internationalization of public education.

The following are several recommendations for improving education during this period:

- Focus on new virtual education platforms in schools to protect privacy.
- Provide the necessary infrastructure for virtual education in the education system.
- Promote the culture of distance learning and accept it as a standard educational practice.
- Redesign certain procedures and structures in the education system to align with virtual education.

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Authors' Contributions

Z. S. conceptualized the study, conducted the systematic review, and led the qualitative data analysis. B. E. contributed to the study design, data extraction, and thematic categorization of challenges. M. S. O. assisted with data interpretation, manuscript preparation, and revision. All authors collaborated on the finalization of the manuscript and approved its submission.

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

Not applicable.

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