




PAPER

Understanding Virtual Learning Challenges: Insights from Jordanian Teachers during COVID-19

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ABSTRACT

The study investigated the challenges faced by teachers in virtual learning environments in a developing country from their own perspectives. To achieve its objectives, a descriptive survey method was employed. A questionnaire was developed and distributed—after checking its validity and reliability—to a sample of 452 teachers selected through stratified random sampling. The findings indicated that teachers faced a moderate level of challenges overall in virtual learning environments. The results also revealed statistically significant differences in the challenges faced by teachers across all domains based on school type, with public school teachers reporting more challenges than those in private schools. However, no significant differences were found in most challenge domains based on gender, except in two specific domains: “challenges related to learners” and “challenges related to school administration,” where female teachers reported greater challenges. Additionally, no significant differences were identified across any domains of challenges based on teaching experience. The researchers recommend that the Ministry of Education create centers to evaluate virtual learning apps, expand teacher training, and enhance parental involvement in distance learning.

KEYWORDS

virtual learning environments, challenges, elementary stage, teachers, Jordan

1 INTRODUCTION AND THEORETICAL BACKGROUND

The world has undergone a rapid transformation due to technological and information revolutions, giving rise to an “electronic society” where data flows seamlessly and drives innovation. This shift, fueled by the internet and satellite communication, has profoundly impacted education, leading to new models designed to address contemporary challenges [22]. A major challenge for education worldwide has been school disruption, particularly due to COVID-19. As the virus spread, students remained at home for safety, prompting the urgent adoption of alternative learning methods. In response, Jordan’s Ministry of Education implemented distance

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learning, notably launching the “Darsak” platform, which included an educational TV channel and online learning networks [8].

Distance learning in virtual environments is an educational approach managed by institutions, where instruction is structured rather than continuous [1] [26]. Mahdi [19] highlighted its use of multimedia to enable flexible learning without social, geographical, or economic barriers. With proper preparation, learners can participate without specific prerequisites [26]. Its openness allows students to customize their learning paths without restrictions related to location, time, age, or rigid schedules [7].

Estetia and Al-Sarhan [12] emphasized the value of distance learning in terms of time efficiency and its role in transforming traditional paper-based knowledge into electronic formats. Its importance also lies in bridging geographical gaps and alleviating challenges such as overcrowded schools, particularly in public institutions with limited infrastructure [16]. Mahdi [19] further noted that a key benefit of distance learning is its capacity to enhance communication through computers, smartphones, tablets, and other smart devices. Additionally, it accommodates individual learning preferences by offering recorded lessons that can be replayed as needed, while also diversifying instructional methods through multimedia technologies, including audio and animation. Recent studies further emphasize that the integration of emerging technologies, such as computer simulations, cloud-based smart solutions, and augmented reality, can significantly expand the effectiveness of distance education by supporting interactive, flexible, and open learning environments [34] [35].

While distance learning offers valuable opportunities to enhance education [28], it also presents several challenges. Lever-Duffy and McDonald [17] identified key obstacles, such as insufficient infrastructure and unreliable internet services, both in terms of quality and speed. These discrepancies result in varying network strengths across regions, with many educational platforms requiring strong connections to function effectively. Additional challenges include limited availability of smart devices and related applications, restricted access to technical support, unsuitable learning environments, and a lack of technology skills among both teachers and students. Lever-Duffy and McDonald [17] further emphasized the issue of cyberbullying, which can have detrimental psychological effects on all participants in the educational process, including students, teachers, and administrative staff. Furthermore, parents may be burdened with the responsibility of supervising and teaching their children during online lessons, regardless of their qualifications or availability.

Scarpellini et al. [25] found that COVID-19 school closures deprived students of social interactions, negatively affecting their personalities and decision-making. Parental preoccupation further weakened communication with teachers, hindering learning. Notably, 1.5% of participants lacked access to technology or support for distance learning. Al-Hamd and Al-Samarrai [6] identified additional challenges, including difficulties in monitoring students, technical issues caused by weak Internet connections, and large class sizes. Faculty faced coordination and logistical problems, while students struggled with prolonged learning durations and insufficient technical skills. A shortage of qualified technical staff added further pressure on teaching assistants. Similarly, Ibrahim and Abu Rawi [15] categorized distance learning obstacles into scientific, technical, financial, and administrative barriers. Abdul Qader [2] highlighted challenges such as teacher skepticism, lack of experience, and insufficient use of diverse teaching strategies. Harsasi and Sutawijaya [29] pointed to difficulties in developing educational software and supporting online learning

environments, while Obaya and Sheikh Saleh [21] noted that limited access to smart devices and unreliable internet continue to hinder effective distance learning.

To understand the nature of the challenges teachers face in virtual learning environments, this study draws on the theoretical perspectives presented by Holmberg [31] [32] [33] within the framework of the theory of interaction and communication in virtual learning. This theory reflects a philosophical dimension that emphasizes that effective learning and teaching are not achieved merely through the transfer of information, but rather through the building of human communicative relationships between the parties involved in the educational process—even in asynchronous virtual environments.

Holmberg [31] argued effective learning in virtual environments is grounded in a sense of interaction and belonging, achieved through opportunities for discussion and the exchange of questions and answers between teacher and learner via various communication tools. This type of communication is an essential element in enhancing learners' motivation and sense of integration, which is reflected in the quality of their learning and understanding of knowledge acquisition. Holmberg also emphasized the importance of allowing learners to express themselves during the learning process, develop independence, and practice critical thinking within the context of directed and purposeful instruction. His theory assumed that education should facilitate the integration of new knowledge into the learner's cognitive structure, rather than mere memorization. Accordingly, the design of a virtual learning environment should take into account the learner's personal dimension and promote active participation in learning decisions, including planning, organizing, and self-assessment.

Holmberg [31] [32] presented a set of principles that form the philosophical foundation of interaction and communication theory. He emphasized that the essence of the educational process lies in the reciprocal interaction between teachers and learners, and that the effectiveness of this interaction increases when accompanied by feelings and emotions, which enhance the enjoyment of learning and foster greater engagement. He also identified motivation as a pivotal element in successful learning, noting that motivation grows as learners derive more enjoyment from the experience. In addition, he highlighted the importance of learner participation in decisions related to their learning, given its role in stimulating intrinsic motivation. He further suggested that designing learning in a way that aligns with the nature of the cognitive content contributes to enhancing the learner's desire to interact with it. Ultimately, he concluded that the achievement of learning objectives by the learner is the key indicator of the effectiveness and quality of teaching.

From this perspective, the challenges facing teachers in virtual environments are not limited to technical or administrative aspects but extend to the educational system's ability to provide a humane, interactive environment that fosters communication and motivation. This theory enables researchers to interpret the difficulties associated with low interaction, limited participation, and weak emotional and cognitive engagement of learners as educational challenges that require solutions based on deep communication and pedagogical foundations.

Studies have highlighted the challenges of distance learning worldwide. In Europe, Šalavėjienė [23] found that distance learning in Lithuania increased teachers' workloads and was ineffective for students with special needs. Teachers struggled with certain platforms, and some parents lacked IT skills to support their children's learning. Motivation declined in some students, who also faced challenges like taking on jobs due to irregular schooling. In South America, De Souza et al. [11] studied students' expectations for vocational and higher education courses and distance learning during the COVID-19 pandemic in Brazil. They found strong student

interest in distance learning, especially among those familiar with information and communication technologies (ICT). However, students with lower technical skills or needing psychological support faced more challenges and showed less interest. The study highlighted that barriers such as limited ICT access and social, economic, and home environment factors hindered distance education success. Addressing psychological, social, and economic issues is key to improving educational outcomes and minimizing losses.

Mahlab's [20] study in Africa explored distance education during the COVID-19 pandemic, finding it less effective due to issues such as unstable internet, lack of experience, limited interaction, stress, and poor infrastructure. Suggestions for improvement included reliable internet access, recording live lectures, enabling video communication, increasing teacher awareness, fostering self-confidence, and scheduling live sessions at convenient times. Al-Salman and Bawaneh [10] studied students' attitudes towards distance learning in Asia during the COVID-19 pandemic. They identified challenges such as limited Internet access, the need for suitable online content, and lack of consideration for individual learning differences. Their recommendations included providing better internet access, offering training on distance learning platforms, redesigning content for digital environments, and equipping schools with necessary resources.

The COVID-19 pandemic forced Jordan to suspend in-person education and shift to distance learning using available technology. Over a year, this transition raised questions about virtual education's effectiveness compared to traditional classrooms. Teachers, as key facilitators, are responsible for communication, task assignments, guiding research, assessments, and providing feedback. Understanding their perspectives on these challenges is crucial for achieving learning objectives. This study aimed to identify the obstacles faced by upper primary school teachers in Amman's public and private schools, gathering their suggestions for overcoming these challenges. Notably, this is the first study of its kind in the region, including feedback from both male and female teachers.

1.1 Study problem and questions

When Jordan's Ministry of Education announced the shift from in-person to distance learning due to COVID-19, opinions were divided. Some called for a return to classrooms, while others emphasized the importance of health measures and supported continuing with distance learning. This debate raised concerns about the legitimacy of decisions regarding the nearly three-term duration of remote education.

A study by Lucky et al. [18] found that in certain subjects, such as science, physical labs produced better results than virtual ones. They also reported that academic integrity was more frequently compromised in distance learning, with students being 12 times more likely to cheat. Many parents expressed concerns about students' declining performance during the shift to distance learning, with 30% of students disengaged due to lack of proper devices or internet access. Additionally, distance learning often followed the rote-learning model of traditional in-person education, with shorter with shorter class times and fewer hands-on experiences [5].

Due to conflicting circumstances, there was an increased emphasis on gathering insights from educational, psychological, and health experts to better understand the issues and identify effective learning approaches during the COVID-19 pandemic. Against this backdrop, the present study explores the challenges faced

by upper primary stage teachers in Jordan regarding distance learning in virtual environments. It aims to examine these challenges from the teachers' perspective, recognizing them as key figures in the educational process. The study seeks to answer the following questions:

1. What challenges do upper primary stage teachers in Jordan face in distance learning within virtual learning environments, from their perspective?
2. Are there statistically significant differences at the level of ($\alpha = 0.05$) in the average responses of upper primary stage teachers in Jordan regarding the challenges they face in distance learning within virtual learning environments, attributed to the variables: type of school, gender of the teacher, and teaching experience?

1.2 Study objectives and importance

This study explores the challenges faced by upper basic stage teachers in distance learning within virtual environments in Jordan, focusing on their perspective. It also examines if significant differences exist in teachers' assessments based on school type, gender, and experience. The study's significance lies in addressing the challenges of sustaining distance learning during the COVID-19 pandemic. It aims to identify obstacles faced by teachers in Amman's educational directorates, motivate best practices for overcoming these challenges, and provide insights to decision-makers in the Ministry of Education. Additionally, the study may inspire future research on distance learning challenges at various educational levels.

1.3 Procedural definitions of study terms

The present study contains several terms that must be defined procedurally as follows:

Distance Learning within Virtual Learning Environments: Defined as a multimedia-based form of learning that facilitates communication between teachers and students in a digital space, occurring either synchronously or asynchronously, overcoming time and location limitations. It follows two main approaches: the first, implemented by the Ministry of Education, utilizes the "Darsak" platform and local educational TV channels for public schools; the second, used in private schools, relies on global platforms such as Zoom, Microsoft Teams, and Learning Management Systems like Moodle for interactive learning experiences.

Challenges Facing Upper Basic Stage Teachers in Distance Learning within Virtual Learning Environments: Defined as the difficulties, obstacles, and challenges, as well as the negative experiences, encountered by upper basic stage teachers in Amman Governorate while delivering instruction through distance learning during the COVID-19 pandemic. The extent of these challenges is measured by the responses to the study's instrument.

1.4 Study limits and determinants

This study is subject to several limitations. It focused specifically on the challenges encountered by upper basic stage teachers (grades 6–10) engaged in distance learning within virtual environments in Amman, Jordan. The participant pool was

limited to teachers working in both public and private schools within the Amman Governorate, and data were collected during the second semester of the 2020–2021 academic year. Consequently, the findings should be interpreted within the context of these temporal, geographical, and participant boundaries. Moreover, the results are influenced by the psychometric properties of the research instrument and the degree of objectivity in participants' responses.

2 METHODOLOGY AND PROCEDURES

This study employed the descriptive survey method to explore the challenges faced by upper basic stage teachers in distance learning within virtual environments in Jordan, based on their perspectives. This approach was chosen as it aligns with the study's objectives.

2.1 Study population and sample

The study population included all male and female teachers in public and private schools within the Amman Governorate of Jordan, specifically those teaching grades six through ten. The total number of teachers was 25,335, as reported in the Ministry of Education's statistical report for the 2020–2021 academic year. From this population, a sample of 452 teachers (male and female) was selected through stratified random sampling, with the sample size determined using the Richard Geiger equation.

2.2 Study instrument

The researchers reviewed several studies [4] [6] [13] [14] [22] [24] [27] [31] [32]. Further, they gathered insights from the educational community, either electronically through emails or through field interviews with teachers, educational administrators, and parents, to collect information and identify some of the challenges facing the application of distance learning in schools. This informed the development of the study instrument (the questionnaire), which was structured in two parts: The first part included demographic information about the teacher, including the study variables: gender, school type, and teaching experience. The second part consisted of 77 items distributed across seven domains, each of which was designed to operationalize aspects of Holmberg's [31] [32] theoretical principles in the context of challenges faced in distance learning.

The domain addressing challenges related to learners' parents captured the extent to which parental support—or its absence—affects the communicative and motivational climate that Holmberg identifies as essential for effective learning. Challenges related to the learning and educational environment reflected the principle that the design of the learning context should enable meaningful interaction, emotional engagement, and a sense of belonging. The domain concerning learners focused on barriers to fostering the independence, self-expression, and critical thinking that Holmberg considered vital for effective virtual learning.

Similarly, the domain addressing educational platform characteristics was closely tied to Holmberg's argument that communication tools are fundamental for dialogue, the exchange of ideas, and sustaining learner motivation. Challenges related

to educational content (curriculum) reflected the assumption that knowledge should be integrated into the learner's cognitive structure, requiring content that supports interaction and meaningful understanding rather than rote memorization. The teacher-related domain examined the extent to which teachers were able to establish communicative relationships, provide purposeful guidance, and motivate learners, which Holmberg viewed as central to effective distance education. Finally, the domain addressing school administration was linked to Holmberg's recognition that institutional support and organization shape the degree to which teachers and learners can engage in reciprocal interaction and learner-centered decision-making.

By aligning each domain with specific principles of Holmberg's theory, the questionnaire operationalized the theoretical framework into measurable categories. This ensured that the challenges under investigation were not only practical in nature but also conceptually grounded in a well-established theory of interaction and communication in distance learning.

The teachers' responses were measured on a five-point Likert scale: (Strongly Disagree = 1, Disagree = 2, Neutral = 3, Agree = 4, Strongly Agree = 5). And to establish the statistical criteria for interpreting the mean scores of responses on the items of the study instrument, the following was determined: Items with mean scores between (1 to 2.33) were categorized as indicating a low level of challenges, items with mean scores greater than 2.33 to 3.66 indicated a moderate level of challenges; while items with mean scores (greater than 3.66 to 5) indicated a high level of challenges.

2.3 Validity and reliability of the study instrument

To ensure content validity of the initial questionnaire, the researchers presented the instrument to 13 experts with doctoral and master's degrees across various educational fields in universities and schools to assess the appropriateness of the items for measuring the intended content, their relevance to the domains, clarity, and linguistic accuracy. Based on the feedback from 85% of the experts, revisions were made, including rephrasing certain items, removing some, and adding others. The final version of the questionnaire included 80 items across seven domains: First Domain: Challenges related to the teacher, containing 13 items. Second Domain: Challenges related to learners, containing 14 items. Third Domain: Challenges related to the educational content (curriculum), containing six items. Fourth Domain: Challenges related to the learning and educational environment, containing 16 items. Fifth Domain: Challenges related to educational platform features, containing 17 items. Sixth Domain: Challenges related to school administration, containing nine items. Seventh Domain: Challenges related to learners' parents, containing five items.

The reliability of the study instrument was confirmed using Cronbach's alpha (for internal consistency). The study instrument was applied to a pilot sample of 30 male and female teachers from the study population but outside the study sample. The results showed that Cronbach's alpha values for the instrument's domains ranged from 0.805 to 0.943, with an overall reliability coefficient of 0.921, indicating high reliability, suitable for the study's purposes.

The reliability of the instrument's items was assessed by administering it to a pilot sample of 30 male and female teachers drawn from the same population but excluded from the main study sample. To examine item consistency within each domain, Pearson correlation coefficients were calculated between the score of each item and the total score of its respective domain. The results of these correlations are presented in Table 3.

Table 1. Pearson correlation coefficients between individual item scores and their corresponding domain total scores

#	Cor. Coe.	#	Cor. Coe.	#	Cor. Coe.	#	Cor. Coe.	#	Cor. Coe.
1	.571**	17	.320*	33	.776**	49	.639**	65	.761**
2	.628**	18	.757**	34	.640**	50	.536**	66	.745**
3	.308*	19	.727**	35	.716**	51	.671**	67	.817**
4	.554**	20	.678**	36	.717**	52	.406*	68	.797**
5	.646**	21	.411*	37	.835**	53	.437*	69	.839**
6	.589**	22	.650**	38	.637**	54	.539**	70	.906**
7	.705**	23	.658**	39	.795**	55	.525**	71	.666**
8	.716**	24	.605**	40	.824**	56	.700**	72	.806**
9	.208*	25	.763**	41	.739**	57	.497**	73	.716**
10	.458*	26	.767**	42	.815**	58	.751**	74	.831**
11	.486**	27	.672**	43	.767**	59	.629**	75	.787**
12	.422*	28	.614**	44	.495**	60	.497**	76	.828**
13	.528**	29	.679**	45	.626**	61	.370*	77	.806**
14	.701**	30	.802**	46	.739**	62	.399*	78	.705**
15	.811**	31	.750**	47	.672**	63	.827**	79	.800**
16	.580**	32	.694**	48	.810**	64	.816**	80	.797**

Notes: **Statistically significant at ($\alpha = 0.01$); *Statistically significant at ($\alpha = 0.05$).

Table 1 presents the correlation coefficients between individual questionnaire items and the total scores of their respective domains. The results revealed relatively high and statistically significant correlations at both the 0.01 and 0.05 significance levels, indicating strong internal consistency within each domain. These correlation values demonstrate the appropriateness of the items in measuring their intended constructs and support the suitability of the instrument for achieving the study's objectives.

2.4 Ethical concerns

Given the sensitive nature of the research, which addressed the challenges faced by teachers in virtual learning environments in a developing country, the researchers ensured strict adherence to ethical standards for educational research. Informed consent was ensured for all participants by clearly explaining the study's objectives, scope, and potential implications, as well as the data usage and their right to withdraw at any time without repercussions. The voluntary nature of participation was emphasized, and participants were assured that refraining from participating would not result in any harm or negative impact. To protect data privacy, the researchers took strict anonymity measures to ensure that none of the information provided could be traced back to specific individuals when presenting or discussing the results. Participants were also informed of data storage

procedures, access mechanisms, and retention periods. To mitigate potential bias in responses, the questionnaire was designed to minimize the influence of social desirability by ensuring confidentiality and anonymity and using non-evaluative questions. The researchers also ensured that the sample represented the true distribution of the teaching community in terms of demographic and professional characteristics and work contexts. The questionnaire tool was reviewed by a group of experts to ensure its validity and reliability and to enhance the reliability of the results obtained.

2.5 Study variables and statistical treatments

The study examined two types of variables: classification variables and dependent variables. The classification variables included gender (male and female), school type (public and private), and teacher experience (less than ten years and ten years or more). To achieve the study’s objectives, data were collected and analyzed using appropriate statistical methods through the Statistical Package for Social Sciences (SPSS). Means and standard deviations were calculated to address the first research question, while Multivariate Analysis of Variance (MANOVA) was employed to answer the second question.

3 RESULTS AND DISCUSSION

3.1 First question

The first question is: “What challenges do upper primary stage teachers in Jordan face in distance learning within virtual learning environments, from their perspective?”. To address this question, the mean and standard deviation were calculated based on the responses of the study participants across its seven domains. Table 2 provides a visual representation of these results.

Table 2. Mean and standard deviations of the challenges facing teachers in distance learning within virtual learning environments

Instrument Domains	Mean	Standard Deviation	Rank	Degree
Challenges related to learners’ parents	3.38	1.011	1	Medium
Challenges related to the learning and educational environment	3.35	0.868	2	Medium
Challenges related to learners	3.33	0.841	3	Medium
Challenges related to educational platform characteristics	3.11	0.810	4	Medium
Challenges related to educational content (curriculum)	2.87	0.940	5	Medium
Challenges related to the teacher	2.86	0.810	6	Medium
Challenges related to school administration	2.41	1.042	7	Medium
Overall	3.08	0.691	–	Medium

Table 2 clearly shows that the overall mean for the challenges faced by upper basic stage teachers in distance learning, from their perspective, was 3.08 with a standard deviation of 0.691, indicating a moderate level of difficulty. This outcome can be explained by the fact that distance learning was only recently introduced in Jordanian schools. The shift required specialized expertise that was not yet fully available among the main stakeholders—teachers, students, parents, school leaders, and technical support staff. Furthermore, the necessary infrastructure to support distance learning was lacking, which affected its effectiveness and success. The limited availability of essential educational tools and support channels for virtual learning added to the difficulties teachers encountered in implementing this modern method of instruction. These challenges were particularly significant for teachers, who are central to the educational process. As is the case with any new educational approach, obstacles are to be expected, and it is reasonable to observe that these challenges are moderate in nature. This finding is consistent with the study by Al-Qiq and Al-Hedmi [9], which also reported a moderate level of challenges faced by teachers during the implementation of distance education during the COVID-19 pandemic.

Table 2 reveals that the challenges related to learners' parents had a mean score of 3.38 and a standard deviation of 1.011, reflecting a moderate level of difficulty. This result reflects the difficulties many parents faced during the recent shift to distance learning, particularly in providing suitable home environments to support their children's learning. Before the transition to distance learning, face-to-face teaching did not rely heavily on parental involvement, especially for older students, who typically managed their studies independently. However, the new demands of distance learning—such as the need for smart devices, high-speed internet, and a dedicated workspace—caught many parents off guard, as they were unprepared to meet these needs. This likely explains the struggles parents faced in adapting to distance learning, which in turn affected their children's performance. As a result, teachers felt that parents were not sufficiently supportive in improving the educational process. This finding is consistent with Abuhammad's study [3], which highlighted parental dissatisfaction with distance learning, citing financial burdens related to providing devices and internet access, which hindered students' engagement. However, these findings differ from those of Šalavėjienė's study [23], which found that parents in Lithuania actively supported their children during the transition to distance learning amid the COVID-19 pandemic, contributing to their academic success.

Table 2 reveals that the domain of the educational learning environment ranked second, with a mean score of 3.35 and a standard deviation of 0.868, indicating a moderate level. This is likely due to the fact that distance learning takes place in a virtual environment, which was recently introduced in the school setting. This marks a significant shift from the traditional, face-to-face classroom, where teachers and students share a physical space with elements like a chalkboard, desks, and chairs. In contrast, the virtual environment separates teachers and students physically and sometimes even temporally. Such a setting demands consistent access to computers, reliable internet, and digital learning platforms. This finding aligns with the results of De Souza et al. [11], who found that teachers encounter several challenges in virtual learning environments, including: 1) difficulty providing psychological support to students, as some feel disengaged and unsupported in this non-traditional mode of learning; 2) limited access to the necessary technical resources for an effective distance learning experience; and 3) the negative impact of the home environment

on learning, which reduces opportunities for students to form real friendships. Similarly, this study's findings align with those of Mahlab [20], which pointed out that students face various obstacles in virtual learning environments, such as feeling unable to ask questions or receive answers during lessons and experiencing boredom due to a lack of engagement in online classes.

Table 2 also reveals that challenges related to learners ranked third, with a mean score of 3.33 and a standard deviation of 0.841, indicating a moderate level of difficulty. This can be explained by the fact that learners had little experience with distance learning and were not provided with training or proper guidance on how to participate effectively. Additionally, upper-basic students have particular needs, such as the desire to be physically present with friends and teachers in familiar environments like classrooms and schoolyards. As a result, many students felt socially isolated, bored, and unmotivated to engage with electronic screens for extended periods during lessons. The situation was further worsened by unreliable and low-quality internet access for many students, leading to reduced motivation and, according to teachers' observations, late arrivals to online classes. Furthermore, cultural factors played a role, with conservative families, particularly those of female students, often restricting the use of cameras, which hindered visual communication between teachers and students during virtual classes. This created disruptions in the learning process, especially during exams, presentations, and student-teacher discussions. Another significant barrier was the limited or lack of access to suitable devices, such as laptops, desktops, tablets, or even smartphones. The small screens on smartphones in particular made learning more difficult. Many families needed these devices for their own online interactions, leaving students without access to adequate technology. These findings are consistent with previous studies that highlight the need for suitable devices and reliable, high-speed internet access. For instance, Khebarah [30] found that students in Algeria faced challenges with poor internet quality, inconsistent connections, frequent outages, limited coverage, and slow speeds, all of which hindered the effectiveness of distance learning. Similarly, Mahlab [20] emphasized that issues with device availability and connectivity, whether partial or total, significantly complicated the implementation of distance learning.

Table 2 shows that the challenges related to the features of educational platforms ranked fourth, with a mean score of 3.11 and a standard deviation of 0.810, indicating a moderate level of difficulty. This finding may be explained by the close interdependence between educational platforms and the learning environment, as these platforms function as the primary virtual medium for teacher-learner interaction. Many platforms offer essential features for distance learning, which is why they are widely adopted by private schools. However, users must have a solid understanding of the platforms' features and specifications and receive training on their effective use. Additionally, some limitations in the platform features occasionally hinder their ability to function as effective learning tools. These platforms were primarily designed as general communication tools for various online social groups, not specifically for educational purposes in schools. This finding is consistent with the study by Al-Salman and Bawaneh [10], which highlighted the challenges learners face in understanding and utilizing the features of distance learning platforms, as well as the need for proper training in their use.

Table 2 also reveals that the challenges related to educational content (school curriculum) ranked fifth, with a mean score of 2.87 and a standard deviation of 0.940, indicating a moderate level. This outcome may be attributed to the role of

teachers in achieving the objectives of the school curriculum during distance learning, which was not significantly different from their role in traditional (face-to-face) education. However, the delivery of the curriculum often relied on sending lesson images, videos, or worksheets prepared by the teacher, which they deemed sufficient for implementing the curriculum, with the main drawback being the lack of face-to-face interaction. As a result, this domain was rated at a moderate level. The implementation of the curriculum lacked many of the interactive and electronic tools necessary for clear and accessible content delivery in a distance learning context. This finding is consistent with Al-Salman and Bawaneh's [10] study, which highlighted the importance of designing educational content for virtual learning environments and platforms, taking into account the varying needs of students and presentation methods. It also aligns with Mahlab's [20] study, which found that students struggled to fully understand the lesson structures during distance learning in the lockdown period, as evidenced by their scattered responses. Although students moderately agreed that the lesson structure served its intended purpose, this was still viewed as a challenge.

Table 2 shows that the domain of challenges related to teachers was ranked sixth, with a mean score of 2.86 and a standard deviation of 0.810, indicating a moderate level of difficulty. This outcome suggests that teachers perceived their performance during the COVID-19 pandemic as generally acceptable. The obstacles they encountered were mainly related to health, social, and psychological issues, along with infrastructure challenges. In contrast, the difficulties related to teaching quality and technological issues in virtual environments were rated lower than those associated with health, social, psychological, or infrastructural concerns. This perception may reflect a potential bias, as the teachers themselves were the respondents to this study. These findings are consistent with Abdul Qader's [2] study, which identified challenges hindering distance learning, including some teachers' lack of belief in the concept of distance learning, reluctance to use it, insufficient experience with virtual e-learning, and a lack of online teaching skills.

Table 2 also shows that the challenges related to school administration received the lowest rank, with a mean score of 2.41 and a standard deviation of 1.042, indicating a moderate level of impact. This result suggests that teachers generally view the role of school administration as somewhat positive. During field visits conducted by one of the researchers, either for surveying teacher challenges or distributing questionnaires in various public and private schools, it was observed that school administrations were actively involved. Private school administrations stood out by closely monitoring the implementation of distance learning, using electronic screens in their offices to oversee virtual classrooms. They ensured that teachers permitted to attend school for remote lessons or those teaching virtually were monitored, observing the interactions between teachers and students to ensure effective learning. Additionally, many modern devices were utilized to offer technical support when necessary. In contrast, public schools showed less efficiency, with school administrations playing a minimal role in distance learning. Online classes via the "Darsak" platform and educational television channels were not interactive, which limited the impact of administrative challenges on distance learning. Administrations primarily focused on ensuring teachers complied with school attendance regulations set by the ministry and overseeing the submission of student grades, along with other administrative tasks. The results of this study align with those of Saleh [24], which indicated that the quality of technical support

services, security, and privacy for students and faculty members was average. However, this study's findings differ from those of Abdul Qader [2], which highlighted significant issues in the system and management of e-learning across all education sectors, noting a lack of organization in the educational process suitable for distance learning.

From the perspective of Holmberg's interaction and communication theory [31] [32] the moderate level of challenges reported by teachers can be understood as stemming from insufficient human and pedagogical interaction in newly implemented virtual learning environments in Jordanian schools. Holmberg emphasizes that effective learning depends not only on information transfer but also on meaningful communicative relationships between teachers and learners, which enhance motivation, engagement, and cognitive integration. The rapid introduction of distance learning meant that teachers, students, parents, administrators, and technical staff lacked the experience and resources needed to establish these interactive relationships fully, which is reflected in the moderate challenges observed.

Specific challenge domains further illustrate these theoretical principles [31] [32]. Parental involvement was a significant issue, as many parents were unprepared to provide devices, stable Internet, and supportive home learning environments, limiting learner engagement and motivation. Similarly, the virtual learning environment itself, learners' readiness, and educational platforms posed obstacles due to physical separation, limited access to resources, social isolation, cultural restrictions, and insufficient interactivity. Holmberg's framework underscores that such limitations hinder the development of effective teacher-learner interactions, reducing learners' sense of belonging and their capacity to actively participate and integrate knowledge.

Challenges related to curriculum delivery, teacher performance, and school administration also aligned with Holmberg's [31] [32] theory. While teachers generally perceived their performance as acceptable, infrastructural, social, and psychological issues persisted, and limited administrative support, particularly in public schools, affected interactive quality. Applying Holmberg's theoretical lens enabled the study to interpret these moderate challenges as reflecting gaps in relational and pedagogical dynamics, guiding both the development of questionnaire items—focused on interaction, communication, motivation, and learner engagement—and the interpretation of results within a conceptual framework emphasizing the centrality of humanized, participatory learning in virtual environments.

3.2 Second question

The second question is: "Are there statistically significant differences at the level of ($\alpha = 0.05$) in the average responses of upper primary stage teachers in Jordan regarding the challenges they face in distance learning within virtual learning environments, attributed to the variables: type of school, gender of the teacher, and teaching experience?" To address this question, the means and standard deviations for the domains of challenges faced by upper-basic stage teachers in distance learning within virtual learning environments were calculated based on the study variables, as presented in Table 3.

Table 3. Means and standard deviations for the domains of challenges facing teachers in distance learning within virtual learning environments according to study variables

Variable	Variable Levels	Domain	Mean	St. De.	
School Type	Governmental	Teacher-related challenges	3.18	0.734	
		Challenges related to the learners	3.58	0.792	
		Challenges related to academic content (curriculum)	3.09	0.874	
		Challenges related to the educational learning environment	3.61	0.828	
		Challenges related to the characteristics of the educational platform	3.38	0.729	
		Challenges related to the school administration	2.77	1.009	
		Challenges related to the parents of learners	3.54	0.903	
	Total			3.35	0.600
	Private	Teacher-related challenges	2.47	0.718	
		Challenges related to the learners	3.02	0.795	
		Challenges related to academic content (curriculum)	2.59	0.948	
		Challenges related to the educational learning environment	3.03	0.807	
		Challenges related to the characteristics of the educational platform	2.77	0.780	
		Challenges related to the school administration	1.97	0.906	
Challenges related to the parents of learners		3.18	1.102		
Total			2.74	0.648	
Experience	Less than ten years	Teacher-related challenges	2.86	0.906	
		Challenges related to the learners	3.34	0.911	
		Challenges related to academic content (curriculum)	2.92	0.957	
		Challenges related to the educational learning environment	3.38	0.908	
		Challenges related to the characteristics of the educational platform	3.12	0.841	
		Challenges related to the school administration	2.42	1.071	
		Challenges related to the parents of learners	3.45	1.057	
	Total			3.10	0.751
	Ten years or more	Teacher-related challenges	2.86	0.740	
		Challenges related to the learners	3.32	0.794	
		Challenges related to academic content (curriculum)	2.83	0.927	
		Challenges related to the educational learning environment	3.33	0.841	
		Challenges related to the characteristics of the educational platform	3.10	0.790	
		Challenges related to the school administration	2.41	1.024	
Challenges related to the parents of learners		3.34	0.979		
Total			3.06	0.651	

(Continued)

Table 3. Means and standard deviations for the domains of challenges facing teachers in distance learning within virtual learning environments according to study variables (*Continued*)

Variable	Variable Levels	Domain	Mean	St. De.	
Gender	Male Teacher	Teacher-related challenges	2.93	0.847	
		Challenges related to the learners	3.31	0.899	
		Challenges related to academic content (curriculum)	2.99	0.979	
		Challenges related to the educational learning environment	3.37	0.925	
		Challenges related to the characteristics of the educational platform	3.19	0.870	
		Challenges related to the school administration	2.41	1.033	
		Challenges related to the parents of learners	3.44	0.988	
	Total			3.12	0.731
	Female Teacher	Teacher-related challenges	2.83	0.787	
		Challenges related to the learners	3.34	0.810	
		Challenges related to academic content (curriculum)	2.81	0.914	
		Challenges related to the educational learning environment	3.34	0.837	
		Challenges related to the characteristics of the educational platform	3.07	0.774	
		Challenges related to the school administration	2.42	1.048	
Challenges related to the parents of learners		3.35	1.024		
Total			3.05	0.670	
Total			3.08	0.690	

Table 3 indicates that there are apparent differences between the means of the variables related to the domains of challenges facing upper elementary teachers in distance learning from their perspective, according to the levels of the study variables: teacher gender, teacher experience, and type of school. To determine the direction of these apparent differences, a MANOVA was conducted, as shown in Table 4.

Table 4. Results of MANOVA according to the levels of study variables

Variable	Variable Level	Sum of Squares	df	Mean Squares	P Value	Sig.
Gender	Teacher-related challenges	1.141	1	1.141	2.168	0.142
	Challenges related to the learners	3.920	1	3.920	6.310	0.012
	Challenges related to academic content (curriculum)	0.149	1	0.149	0.181	0.671
	Challenges related to the educational learning environment	1.924	1	1.924	2.896	0.090
	Challenges related to the characteristics of the educational platform	0.383	1	0.383	0.678	0.411
	Challenges related to the school administration	6.206	1	6.206	6.769	0.010
	Challenges related to the parents of learners	0.046	1	0.046	0.047	0.829

(Continued)

Table 4. Results of MANOVA according to the levels of study variables (*Continued*)

Variable	Variable Level	Sum of Squares	df	Mean Squares	P Value	Sig.
Experience	Teacher-related challenges	0.996	1	0.996	1.894	0.169
	Challenges related to the learners	1.122	1	1.122	1.807	0.180
	Challenges related to academic content (curriculum)	2.479	1	2.479	3.018	0.083
	Challenges related to the educational learning environment	1.812	1	1.812	2.727	0.099
	Challenges related to the characteristics of the educational platform	1.053	1	1.053	1.864	0.173
	Challenges related to the school administration	1.698	1	1.698	1.852	0.174
	Challenges related to the parents of learners	2.827	1	2.827	2.852	0.092
School Type (Governmental/ Private)	Teacher-related challenges	58.295	1	58.295	110.818	0.000
	Challenges related to the learners	40.805	1	40.805	65.682	0.000
	Challenges related to academic content (curriculum)	26.145	1	26.145	31.820	0.000
	Challenges related to the educational learning environment	41.372	1	41.372	62.253	0.000
	Challenges related to the characteristics of the educational platform	41.096	1	41.096	72.761	0.000
	Challenges related to the school administration	78.642	1	78.642	85.787	0.000
	Challenges related to the parents of learners	14.936	1	14.936	15.066	0.000
The Error	Teacher-related challenges	235.139	447	0.526		
	Challenges related to the learners	277.696	447	0.621		
	Challenges related to academic content (curriculum)	367.274	447	0.882		
	Challenges related to the educational learning environment	297.062	447	0.665		
	Challenges related to the characteristics of the educational platform	252.468	447	0.565		
	Challenges related to the school administration	409.767	447	0.917		
	Challenges related to the parents of learners	443.153	447	0.991		
All	Teacher-related challenges	294.554	450			
	Challenges related to the learners	318.606	450			
	Challenges related to academic content (curriculum)	397.742	450			
	Challenges related to the educational learning environment	338.842	450			
	Challenges related to the characteristics of the educational platform	294.992	450			
	Challenges related to the school administration	488.432	450			
	Challenges related to the parents of learners	460.291	450			

Table 4 shows no statistically significant differences at the significance level ($\alpha = 0.05$) between the means in the domains of challenges facing teachers in

distance learning attributed to the teacher's experience variable. This finding may be explained by the fact that teachers in both public and private schools had previously relied on a face-to-face instructional system. Therefore, regardless of the teacher's experience in teaching, it was based on a method that relied on different tools and methods used in face-to-face education. In contrast, the style required for distance learning demands a different type of expertise, which very few teachers had, as only a small number had prior personal experience with distance learning or had taken courses on it. Hence, the number of these experienced teachers is negligible compared to those teaching in various schools in Amman Governorate. It can be said that almost all teachers began with similar levels of experience in distance learning when the lockdown was enforced and distance learning was introduced in schools across the country. This result is consistent with the study by Al-Qiq and Al-Hedmi [9], which showed no statistically significant differences attributed to the teacher experience variable.

Table 4 indicates no statistically significant differences at the 0.05 level between male and female teachers regarding the challenges they faced in distance learning across the five domains: teacher-related, curriculum-related, learning environment, platform-related, and challenges related to learners' parents. This absence of gender-based variance may reflect the overarching impact of the COVID-19 pandemic, which imposed uniform structural conditions on all educators, irrespective of gender. The nationwide shift to distance learning, mandated by the Ministry of Education and Civil Defense, left teachers across the board with limited preparation and little institutional support. Consequently, both male and female teachers were thrust into a pedagogical shift under similar constraints, leading to comparable experiences. While this explanation offers a plausible rationale, it is essential to interrogate this uniformity further. The finding could also suggest that systemic responses to the pandemic were gender-neutral in their implementation or that gendered nuances in digital pedagogical engagement remain under-researched or under-reported in such contexts. These results parallel those reported in Saleh's [24] study, reinforcing the need for future research to explore the subtle, perhaps latent, ways in which gender may interact with professional and institutional structures in online teaching environments.

In contrast, Table 4 reveals statistically significant differences in two domains—challenges related to students and challenges related to school administration—favoring male teachers, with female teachers reporting higher levels of challenge. This finding invites deeper interpretation beyond surface-level cultural explanations. While it is plausible that female teachers, particularly those working with female students, may navigate more complex cultural expectations and face greater difficulties engaging students through virtual platforms in conservative contexts, this must be situated within broader socio-cultural and institutional frameworks. Gendered norms around communication, visibility, and expectations of professionalism for women in education may intersect with the affordances and limitations of distance learning technologies, thereby intensifying perceived challenges. Additionally, the notion that female-led school administrations impose stricter adherence to procedural compliance warrants empirical exploration, as it may reflect broader organizational cultures or leadership styles rather than gender per se. Such interpretations highlight the importance of addressing how gender dynamics operate within both instructional and administrative dimensions of distance learning.

Furthermore, Table 4 presents statistically significant differences across all domains of distance learning challenges attributed to school type, with public school teachers reporting greater difficulties than their counterparts in private schools.

This disparity reflects structural inequities in how distance education was implemented across sectors. Public schools were bound to centralized directives, such as the mandatory use of the “Darsak” platform and reliance on televised lessons, which severely limited teacher agency and student-teacher interaction. The role of the teacher was often reduced to that of an evaluator rather than an active facilitator of learning, undermining the pedagogical potential of distance education. In contrast, private schools exhibited greater flexibility, adopting diverse technological platforms that allowed synchronous interaction, curated asynchronous content, and continuous engagement via social media. These institutional affordances empowered teachers with tools and support mechanisms to navigate distance teaching more effectively. The difference in challenges, therefore, is not simply a matter of platform choice but reflects deeper systemic inequalities in policy implementation, infrastructure availability, and administrative autonomy. These findings are consistent with those of Al-Qiq and Al-Hedmi [9], who also noted greater challenges among public school teachers during the pandemic. The results underscore the critical need to examine how policy frameworks and resource allocation shape educational equity in virtual learning environments.

4 CONCLUSION AND RECOMMENDATIONS

This study explored the challenges faced by upper elementary teachers in Jordan when implementing distance learning in virtual environments. The results showed a moderate level of overall challenges, with public school teachers facing more difficulties than their private school counterparts. No significant gender-based differences were found, except in the “student-related” and “school administration-related” challenge domains, where female teachers reported more issues. Teacher experience did not significantly affect the challenges.

Based on these findings, several actionable and context-specific recommendations can be made. First, targeted support should be prioritized for public schools, as teachers in these settings reported greater difficulties. Educational authorities should design professional development programs that specifically address classroom management, student engagement, and administrative coordination in online contexts. These programs should include practical, low-cost strategies—such as leveraging mobile-friendly platforms and simple digital tools that require minimal bandwidth—to ensure accessibility and sustainability across schools with varying resources. Second, gender-specific challenges require focused attention. Since female teachers reported more issues in student-related and administrative areas, tailored initiatives such as mentoring circles, peer-support networks, and flexible training formats can be developed. These approaches not only help address immediate challenges but also build long-term professional resilience.

Infrastructure and connectivity improvements remain essential. Partnerships with telecommunications providers should focus on affordable internet bundles and subsidized mobile data packages that directly support teachers and students, particularly in public schools where connectivity challenges are most pronounced. Furthermore, collaboration between public and private schools can be strengthened through structured platforms for sharing best practices, cost-effective teaching strategies, and digital learning resources. In addition, active parent engagement should be institutionalized as part of the distance learning model. Establishing clear communication channels—such as mobile messaging groups, virtual parent meetings,

and parent training modules—can enhance student participation and accountability in the learning process.

For future research, studies should investigate practical strategies to reduce the specific challenges of public schools, assess the effectiveness of professional development and low-cost technological support initiatives, and explore models of parent–school partnerships in sustaining student engagement. Further investigation of gender-related differences in challenges is warranted, and comparative studies across different regions could help identify transferable, context-sensitive best practices for overcoming obstacles in distance learning.

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