

# Communication Challenges in Virtual Learning Environments and Their Impact on Students' Learning

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## Abstract

The expanding role of information and communication technologies has fundamentally altered educational practice, a shift that became especially pronounced during the accelerated digital transition prompted by the COVID-19 pandemic. Virtual Learning Environments (VLEs) now serve as central platforms that enable instructors and students to exchange resources, interact, collaborate, and complete assessments remotely. Their principal advantages—flexibility and accessibility—have made them particularly valuable for learners operating across varied locations and schedules. Yet the pedagogical potential of VLEs is frequently undermined by persistent communication difficulties that shape the quality of the learning experience.

This conceptual paper reviews the principal communication challenges associated with VLEs and examines their consequences for student learning. Drawing on the existing literature, the analysis identifies a set of recurring obstacles: unreliable internet connectivity, diminished social presence, restricted interaction opportunities, delayed or insufficient feedback, uneven digital competencies, and reduced learner engagement. These issues extend beyond mere technical inconvenience; they influence students' motivation, self-confidence, satisfaction, and academic outcomes. In many instances they also generate stress, feelings of isolation, and disparities in learning opportunity.

If higher-education institutions wish VLEs to support genuine educational value, they must attend simultaneously to the technological infrastructure and the human dimensions of communication. The paper concludes that deliberate efforts to strengthen communication within VLEs are indispensable for enhancing student engagement, fostering deeper learning, and ensuring the long-term viability of digital education.

**Keywords:** Virtual Learning Environment, Communication Challenges, Student Learning, Online Education, Student Engagement, Digital Learning.

## 1. Introduction

The rapid expansion of information and communication technologies in the twenty-first century has reshaped educational practice at every level. Schools, colleges, and universities increasingly depend on digital platforms to extend teaching and learning beyond the physical classroom. Among the most widely

adopted of these tools are Virtual Learning Environments (VLEs), which support the delivery of content, facilitate interaction, and promote more learner-centred approaches to instruction.

A Virtual Learning Environment is a web-based system that enables teachers and students to exchange resources, engage in discussion, submit and receive feedback on assessments, and maintain ongoing communication within a shared online space. Platforms such as Moodle, Google Classroom, Blackboard, and Microsoft Teams have widened access to education and offered greater flexibility for many learners (4). The value of these systems became especially evident during the COVID-19 pandemic, when institutions worldwide shifted abruptly to online delivery in order to sustain educational continuity (8,16,17).

Despite these advantages, the integration of VLEs has not been without challenges. Communication remains one of the most persistent difficulties. Effective learning relies not only on the availability of materials but also on timely interaction, clarification of concepts, constructive feedback, and a sense of social and academic connection between teachers and students. In conventional classrooms these processes often occur spontaneously through face-to-face exchange. In virtual settings, however, communication is mediated by technology. This mediation can introduce delays, reduce the visibility of non-verbal cues, and create a sense of psychological or transactional distance (14; 5). As a result, students may experience diminished motivation, lower levels of participation, reduced satisfaction, and weaker academic outcomes.

Additional factors compound these communication difficulties. Asynchronous discussion forums can leave messages unanswered for extended periods, while synchronous sessions may be hampered by technical instability or uneven digital access. The absence of immediate social presence can foster feelings of isolation, particularly among learners who lack strong peer networks or reliable internet connectivity. These issues affect not only individual engagement but also the overall quality of the learning community that a VLE is intended to support.

This paper examines the principal communication challenges that arise within Virtual Learning Environments and considers their influence on students' learning experiences and academic outcomes. By analysing both the technological and pedagogical dimensions of these challenges, the study aims to identify practical strategies that may help educators and institutions strengthen interaction and support more effective online learning.

## **2. Literature Review**

Research on Virtual Learning Environments has grown substantially over the past two decades, reflecting both the pedagogical promise of these platforms and the practical difficulties that accompany their widespread use. Early theoretical work laid the foundation for understanding why communication often proves problematic in online settings. Moore's (1993) theory of transactional distance remains particularly influential. Moore argued that distance education is characterised not merely by physical separation but by a psychological and communicative gap between instructor and learner. This gap widens when dialogue is limited, course structure is rigid, and learner autonomy is high. In a VLE, the absence of spontaneous face-to-face exchange can increase transactional distance, making clarification slower and mutual understanding more fragile.

A complementary perspective is offered by the Community of Inquiry (CoI) framework developed by Garrison, Anderson and Archer (2000). The model identifies three interdependent presences—social, cognitive and teaching—that together support meaningful online learning. Social presence, the ability of

participants to project themselves as “real” people and establish interpersonal relationships, is especially vulnerable in text-based or asynchronous environments. When social presence is weak, cognitive presence (the construction of meaning through sustained discourse) and teaching presence (design, facilitation and direction) are also compromised. Subsequent studies have repeatedly confirmed that low social presence correlates with reduced engagement and lower satisfaction (6; 13).

Empirical investigations conducted before and during the COVID-19 pandemic have documented a consistent set of communication-related obstacles. Students frequently report delayed feedback, limited opportunities for informal interaction, and difficulty interpreting tone or intent in written messages (1; 9). Asynchronous discussion forums, while flexible, often produce fragmented conversations in which contributions arrive days apart and threads lose coherence. Synchronous tools such as video conferencing restore some immediacy, yet they introduce new problems: unstable internet connections, “Zoom fatigue,” and the loss of peripheral classroom cues that help instructors gauge understanding (5). Technical barriers—uneven device access, bandwidth limitations and varying levels of digital literacy—further restrict participation, particularly among students from lower-income or rural backgrounds (1).

These communication difficulties carry measurable consequences for motivation and achievement. When learners feel isolated or unable to obtain timely clarification, intrinsic motivation declines and surface approaches to learning become more common (20). Studies of Moodle and Blackboard implementations have shown that poorly moderated forums can leave large numbers of students as “lurkers” who read but rarely post, thereby diminishing the collaborative potential of the platform (13). In contrast, courses that deliberately cultivate teaching presence through regular instructor announcements, prompt feedback and structured peer interaction tend to report higher completion rates and greater student satisfaction (4).

Recent scholarship has also drawn attention to the emotional dimension of online communication. Feelings of loneliness and reduced belonging have been linked to lower academic persistence, especially among first-year and non-traditional students (18). The rapid shift to emergency remote teaching during the pandemic intensified these issues, revealing that many instructors lacked prior training in facilitating online dialogue and that institutional support for digital pedagogy remained uneven (8).

Taken together, the literature indicates that the effectiveness of a Virtual Learning Environment depends less on the sophistication of the technology itself than on the quality of the communicative practices it supports. While VLEs have expanded access and flexibility, persistent gaps in dialogue, social presence and timely feedback continue to undermine learner engagement and outcomes. The present study builds on this body of work by examining how these communication challenges manifest in contemporary VLE use and by identifying pedagogical strategies that may help reduce transactional distance and strengthen the sense of community within online learning spaces.

### **3. Virtual Learning Environments: An Overview**

Virtual Learning Environments (VLEs) are web-based platforms designed to support teaching and learning beyond the constraints of time and physical location. They integrate instructional resources with a range of communication tools, enabling educators to upload course materials, organise structured discussions, set assignments, monitor progress, and deliver feedback through both synchronous and asynchronous channels. In this way, VLEs function as comprehensive digital spaces in which teaching and learning can continue outside the traditional classroom.

Dayag and Famarzi (2024) observe that VLEs have become an integral part of the contemporary academic landscape. They facilitate collaborative activity, promote greater learner independence, and

expand access to educational opportunities for students who might otherwise be excluded by geography, work commitments, or personal circumstances. Complementary findings indicate that these platforms also support continuous assessment and flexible pacing, allowing both teachers and students to adapt the timing and mode of engagement to their individual needs (2). Beyond content delivery, many modern VLEs incorporate learning analytics, multimedia resources, and tools for peer collaboration, features that further enhance their instructional potential when used purposefully.

Nevertheless, the educational value of a VLE is not determined solely by the range of technical functions it offers. The quality of communication that the platform enables remains central. Even a well-designed system loses effectiveness if interaction between teachers and students is limited, delayed, or superficial. In practice, therefore, the strength of a VLE rests as much on the pedagogical practices it supports—clear guidance, timely feedback, and opportunities for meaningful dialogue—as on its technological capabilities. When these communicative elements are carefully designed and actively maintained, VLEs can serve as robust environments for sustained and inclusive learning.

#### **4. Communication Challenges in Virtual Learning Environments**

##### **4.1 Technological and Connectivity Barriers**

A frequent and practical obstacle in virtual learning is the reliability of the technological infrastructure that underpins it. Unstable internet connections, intermittent server problems, software glitches, and disrupted audio or video streams routinely interrupt exchanges between students and instructors. Shazali and Hashim (2018) identified weak internet connectivity as a significant barrier to the effective use of virtual platforms, while Mahajan (2016) observed that technical failures and networking difficulties frequently break the flow of communication and reduce the overall effectiveness of learning. These problems become especially pronounced when students must download large files, stream recorded lectures, or take part in live sessions that demand consistent bandwidth.

The issue is particularly acute in developing contexts, where access to dependable digital infrastructure remains uneven. In such settings, repeated communication breakdowns can result in missed lessons, incomplete participation, and a fragmented learning experience. Beyond individual inconvenience, these technical barriers also raise questions of equity, as students with limited access to devices or reliable connectivity are systematically disadvantaged (1).

##### **4.2 Lack of Social Presence and Human Interaction**

In a conventional classroom, communication extends well beyond spoken words. Facial expressions, gestures, tone of voice, eye contact, and immediate reactions all help build shared understanding and mutual trust. These social cues are frequently absent or diminished in virtual environments, which can leave online learning feeling distant or impersonal. Mahajan (2016) noted that mediated communication often produces relationships that feel less personal and less immediate. When students struggle to establish a sense of social presence, they may experience isolation, uncertainty, or a weakening of their connection to the course community. Over time, this reduced sense of belonging can erode emotional investment in learning.

For many learners, particularly those new to online study, the scarcity of human interaction makes sustained motivation and engagement more difficult. The absence of informal hallway conversations or spontaneous classroom exchanges removes an important layer of social support that traditional settings often provide almost unnoticed.

#### **4.3 Inadequate Interaction and Collaboration**

Learning is rarely a purely passive activity. It typically relies on discussion, questioning, collaboration, and the exchange of ideas. Yet many Virtual Learning Environments still function primarily as repositories for files and announcements rather than as spaces that actively foster dialogue. (3) found that students frequently regard digital learning materials as static and insufficiently engaging. While slides and recorded lectures remain useful resources, they do not automatically prompt active participation. When learners are expected mainly to read or watch without adequate opportunities to respond or work with peers, interest can decline rapidly.

Li (2022) similarly observed that a number of VLE initiatives prioritise administrative functions over the cultivation of meaningful communication practices. Consequently, sustained group work, peer discussion, and collaborative problem-solving become harder to maintain. Without regular and purposeful interaction, virtual learning risks becoming isolated and largely one-directional.

#### **4.4 Delayed Feedback and Communication Gaps**

Timely feedback forms a central part of effective teaching and learning. In face-to-face settings, students can often raise questions and receive clarification almost immediately. In virtual environments, however, communication frequently occurs asynchronously through email or discussion boards, introducing inevitable delays. Instructors themselves may face heavy workloads associated with preparing online materials, monitoring multiple discussion threads, and responding to individual messages (19). This pressure can make rapid replies difficult.

When feedback is slow to arrive, students may become uncertain about their progress or unsure whether they have understood key concepts correctly. Prolonged uncertainty can undermine confidence and discourage further participation. Some learners begin to perceive support as unavailable, even when instructors are working under considerable constraints.

#### **4.5 Insufficient Digital Competencies**

Effective use of a VLE requires more than access to a device and an internet connection. It also depends on digital confidence and the ability to navigate online tools with relative ease. Not all teachers and students possess these skills to the same degree. Shazali and Hashim (2018) reported that limited teacher competence and inadequate training can impede the successful adoption of VLEs. Safitri and Aziz (2023) likewise observed that many students lack the confidence and technical fluency needed for effective online learning.

When digital competencies are weak, everyday communication tasks become more burdensome. Students may struggle to submit assignments, join discussions, or locate materials, while instructors may find it harder to organise activities or respond efficiently. The resulting frustration can further reduce participation and reinforce existing inequalities in access and opportunity.

#### **4.6 Reduced Motivation and Engagement**

Maintaining student motivation remains one of the most persistent communication-related challenges in virtual settings. When interaction is limited or impersonal, learning can easily become passive, with students receiving information rather than actively constructing understanding. (3) found that motivation often declines when materials lack interactivity, a difficulty especially evident in subjects that require frequent clarification and guided practice, such as computer programming. Mahajan (2016) similarly suggested that virtual learning can encourage passive habits if students receive insufficient attention and encouragement.

Because online study places greater demands on self-discipline, learners who experience weak communication or limited social support may lose interest more quickly. Over time, reduced engagement can affect both academic performance and the overall quality of the learning experience.

Collectively, these challenges illustrate that the success of a Virtual Learning Environment depends not only on technological capacity but also on the deliberate design of communicative practices that foster presence, dialogue, timely support, and sustained motivation.

## **5. Impact of Communication Challenges on Students' Learning**

### **5.1 Decline in Academic Performance**

Communication difficulties can have a direct and cumulative effect on students' grasp of course content. When explanations remain unclear, feedback arrives late, or questions go unanswered for extended periods, learners often struggle to construct accurate conceptual understanding. Over time, these gaps contribute to weaker academic performance and shallower long-term retention. Students may complete required tasks while still harbouring misconceptions, which undermines both immediate results and the deeper learning that formal education aims to foster (1). In subjects that build progressively on prior knowledge, unresolved communication shortfalls can compound across modules and create lasting deficits.

### **5.2 Reduced Student Engagement**

Engagement is closely tied to the quality and frequency of interaction. When opportunities for meaningful exchange are limited, students become less inclined to join discussions, contribute to group work, or participate actively in other learning activities. Many begin to position themselves as passive observers rather than active participants. (3) found that learning resources perceived as insufficiently interactive tend to reduce participation within Virtual Learning Environments. This matters because engagement is strongly associated with persistence, achievement, and overall satisfaction. Without regular dialogue, the motivational momentum that sustains study can erode relatively quickly.

### **5.3 Increased Psychological Stress and Isolation**

The absence of meaningful interaction also carries emotional consequences. Numerous learners report feelings of loneliness, frustration, boredom, or anxiety when they sense disconnection from instructors and peers. Mahajan (2016) observed that the lack of immediacy characteristic of many virtual environments can generate emotional discomfort and diminish interest in learning. These affective responses frequently interfere with concentration and make sustained commitment more difficult. In prolonged online programmes, the cumulative sense of isolation may further heighten stress and reduce students' willingness to seek help when they need it (18).

### **5.4 Learning Inequalities and the Digital Divide**

Communication challenges do not affect all students to the same degree. Learners from lower-income backgrounds or regions with inadequate digital infrastructure typically encounter more substantial barriers. Without reliable internet access or suitable devices, students may be unable to join live sessions, submit work punctually, or maintain effective contact with teachers. Li (2022) and related studies have shown that social and economic differences continue to shape access to digital learning opportunities. As a result, Virtual Learning Environments can, under certain conditions, widen rather than narrow existing educational inequalities (1). Institutional efforts that overlook these disparities risk reinforcing structural disadvantages.



### **5.5 Reduced Satisfaction and Overall Learning Experience**

Although VLEs offer clear advantages in flexibility and convenience, student satisfaction declines when communication remains weak. Delayed responses, restricted interaction, and recurring technical problems frequently leave the learning experience feeling frustrating rather than supportive. Research consistently indicates that both students and instructors recognise the potential value of these platforms, yet they also emphasise the necessity of stronger communicative practices and more reliable technological support (2). Satisfaction, therefore, depends not merely on access to the system but on the extent to which the environment sustains genuine human interaction and timely guidance.

### **5.6 Increased Risk of Disengagement and Dropout**

When communication problems persist over an extended period, some students gradually withdraw from active learning. Repeated technical difficulties, inadequate feedback, and a perceived lack of support can steadily undermine motivation and commitment. This risk is particularly pronounced in demanding subjects that require regular clarification and guided practice. Learners who feel unsupported for too long may reduce their participation or, in more severe cases, consider withdrawing from the course altogether. Early detection of disengagement signals and responsive communication strategies therefore become critical for retention.

Taken together, these impacts demonstrate that communication challenges in Virtual Learning Environments extend well beyond inconvenience. They influence academic outcomes, emotional well-being, equity of opportunity, and students' longer-term relationship with formal learning. Addressing them requires deliberate pedagogical design as well as institutional attention to infrastructure and support systems.

## **6. Strategies for Addressing Communication Challenges in VLEs**

Addressing communication difficulties in Virtual Learning Environments requires coordinated action at institutional, pedagogical, and individual levels. Improvements in technology alone are insufficient; attention must also be given to teaching practices, course design, and the support provided to both educators and learners.

First, educational institutions need to invest in reliable digital infrastructure and actively work to reduce inequalities in access to devices and internet connectivity. Without a stable technological foundation, communication breakdowns will continue to disrupt learning, particularly for students in under-resourced settings (1). Equitable access remains a prerequisite for meaningful participation.

Second, teachers and facilitators should receive sustained professional development that strengthens both their technical competence and their capacity to teach effectively in online environments. Digital tools yield the greatest benefit when educators understand how to design interaction, manage asynchronous discussions, and maintain teaching presence (13). Ongoing training, rather than one-off workshops, is more likely to produce lasting changes in practice.

Third, learning materials and activities should be deliberately designed to promote active participation rather than passive consumption. Discussion forums with clear expectations, collaborative tasks, simulations, peer-review activities, and carefully structured gamified elements can increase involvement and make learning more interactive (3). When students are invited to respond, create, and collaborate, social and cognitive presence are strengthened.

Fourth, institutions and instructors should establish clear and responsive feedback systems. Timely replies to queries, regular formative comments, and transparent communication channels reduce uncertainty and

help students build confidence in their progress. Predictable response times and structured opportunities for clarification are especially important in asynchronous environments where delays can otherwise accumulate.

Fifth, students themselves require support in developing digital literacy, self-regulated learning strategies, and collaborative skills. Orientation programmes and ongoing guidance can equip learners to navigate platforms confidently, manage their time, seek help appropriately, and contribute productively to online discussions. These competencies reduce frustration and enable more equitable participation.

Finally, a broader institutional culture that values communication quality is essential. Regular evaluation of student experience, peer support among teaching staff, and the integration of learning analytics to identify disengagement early can help institutions respond proactively rather than reactively. When these complementary strategies are pursued together—infrastructure, professional development, interactive design, timely feedback, student preparation, and continuous improvement—Virtual Learning Environments are more likely to support the meaningful interaction on which effective learning depends.

## Conclusion

Virtual Learning Environments have reshaped contemporary education by offering greater flexibility, wider accessibility, and increased adaptability in teaching and learning. Yet the effectiveness of these platforms continues to rest heavily on the quality of communication they support—an area that remains one of their most persistent limitations. Technical barriers such as unreliable connectivity, diminished social presence, restricted opportunities for interaction, delayed feedback, uneven digital competence, and declining engagement collectively undermine the learning experience for many students.

These difficulties extend well beyond matters of convenience. They influence academic performance, motivation, emotional well-being, overall satisfaction, and equity of access. In more severe cases, sustained communication shortfalls can contribute to disengagement or withdrawal from study (1; 3). Communication should therefore be regarded as a foundational element of virtual learning rather than a secondary or optional feature.

If institutions wish Virtual Learning Environments to deliver meaningful educational outcomes, they must invest simultaneously in robust technical infrastructure and in the human capacities that sustain dialogue, presence, and timely support. Professional development for educators, thoughtfully designed interactive activities, responsive feedback systems, and targeted support for students' digital and self-regulatory skills all form part of this broader effort (13). The long-term value of digital education will depend less on the mere availability of platforms and more on the extent to which those platforms enable genuine connection, purposeful interaction, and collaborative learning. Strengthening communication within Virtual Learning Environments is consequently essential both for improving student learning in the present and for securing the enduring contribution of online education.

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