Digital well-being begins with inclusion: A systematic review of videoconferencing guidelines for equitable learning

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As higher education institutions increasingly adopt videoconferencing technologies to broaden access to learning, the need for evidence-based, inclusive practices to support digital well-being becomes paramount. Integrating these technologies into the curriculum necessitates careful design considerations to prevent unintended consequences and uphold learners' privacy, safety, equity and humanity. Our systematic review, based on eight dimensions of digital wellness, has identified key inclusive design decisions for videoconference-enabled formal learning experiences. Drawing from data analysed from 36 empirical studies, we organised six inclusive design considerations for digital wellness in videoconferencing learning environments. These considerations – accessibility, active learning strategies, multimodal communication, readiness, social presence and sociocultural sensitivity – offer course designers a practical framework to create evidence-based practices that foster digital wellness and inclusion in videoconferencing learning spaces.

Implications for practice or policy:

- Academic institutions should recognise digital wellness as a shared responsibility among institutional stakeholders, including faculty, learners, and administrative professionals.
- Institutional policies should prioritise learner choice and equitable access for co-creating knowledge and fostering safe communication.
- Stakeholders should be empowered to make informed choices about digital habits to mitigate unintended consequences and encourage mindful technology use.
- Accessibility barriers must be addressed through intentional learning design, ensuring meaningful participation and interaction for all.

Keywords: digital wellness, inclusive design, videoconferencing, higher education, systematic review

Introduction

The reported scoping study explored the effective design of videoconferencing-based learning in higher education and, more specifically, design considerations to create inclusive environments and practices that foster the digital wellness of the participants' learning experience. The findings contribute to design guidelines for inclusion in videoconferencing-based learning in higher education as well as guiding questions that support learning designs to foster digital wellness.

Videoconferencing is widely used as a learning tool that promotes multimedia communication, resource exchange, collaboration, and co-creation of learning artifacts (Correia et al., 2020). Advances in videoconferencing technology have been leveraged to provide synchronous learning opportunities and extend digital face-to-face interaction across geographical distances (Lawson et al., 2010). Notably, videoconferencing technology was often the only or preferred method to facilitate learning and readily transition from in-person to distance learning as a reaction to COVID-19 (Crawford et al., 2020). The global pandemic exposed the inequalities in education and technology solutions. Videoconferencing-enabled learning was not immune to deficient conditions and factors. Although digital multimedia technologies have opened new opportunities for advancing online pedagogy, "synchronous videoconferencing systems may not necessarily deliver the required set of learning outcomes and an enhanced pedagogy to users" (Al-Samarraie, 2019, p. 123). Apart from the potential pedagogical challenges of videoconferencing-

enabled learning, the technological dimensions and how the two interplay needs consideration. Videoconferencing is a complex digital communication medium influenced by its technological capabilities, functionality and accessibility. Its effectiveness in learning depends on how well these aspects are integrated into pedagogically sound instructional design and applied within the specific educational context. In the videoconferencing setting, similarly to other digital contexts, the balanced interplay of digital pedagogy and technology connects learners and instructors to promote knowledge co-creation through collective inquiry and meaning-making. In today's culture, where education is increasingly viewed as an economic transaction and digital technologies are "adopted by institutions for efficiency, progress tracking, and automation" (Köseoğlu et al., 2023, p. 3), many educators still want:

> to learn more about how to teach better in online and blended contexts. They wanted to know more about how to protect their students' wellbeing, privacy, and dignity; how to build meaningful connections and communities; and how to create inclusive and accessible educational materials and spaces. (Köseoğlu et al., 2023, p. 3)

Despite its capabilities and functionality, digital technology is not neutral as it seeks to attract attention and alter our behaviour (Small et al., 2020); protecting learners' privacy, safety, equity and humanity requires special consideration.

As more educational communities continue to leverage videoconferencing technology's affordances to facilitate learning, the digital wellness of learners should be addressed through design considerations that support equitable access, usability and inclusive learning experiences for all participants as part of their holistic well-being. Based on preliminary findings from a multiple-phased systematic review study and building upon the work of Palalas (2019) and Palalas et al. (2020), we have summarised six design considerations to facilitate inclusive videoconferencing learning experiences.

Digital wellness in online spaces

In exploring videoconferencing guidelines for inclusion, we applied the principles of digital wellness with characteristics of human-centred digital learning design in higher education as an instructional design that fosters the digital wellness of its participants.Digital wellness is described as "the optimum state of health and well-being that each individual using technology is capable of achieving" (Blankson & Hersher, 2021, p. 4). As a concept, digital wellness acknowledges individuals' diverse circumstances and choices as they engage with others, access resources and employ technology for learning in videoconferencing environments. In pursuit of this goal, we examined practices and tools designed to maximise the benefits of educational technology while mitigating its potential risks.The holistic lens we employed considered these eight dimensions of learner experience and their interdependence: cognitive, social, emotional, spiritual, physical, digital identity, environmental and productivity.

The accelerated advancements in digital technology and the relationship between technology and humans directly impact online learning (Churchill et al., 2013). The current technology landscape has outpaced our ability to adapt to the new digital algorithms. More generally, technology users are affected by the not-so-neutral agendas of some digital tools and platforms. Wilson (2017, p. 90) warned that modern humanity is distinguished by "paleolithic emotions, medieval institutions, and god-like technology". Digital technology automates and perhaps assists with human efficiencies, with artificial intelligence solving mathematics problems and producing poetry and music (e.g., Köbis & Mossink, 2021), but it also exploits human vulnerabilities. It often uses our human nature against us to influence our choices, starting by incentivising what content we select, how we interact with it and for how long. In this era of the attention economy, driven by capitalist structures of competition and profit (Bhargava & Velasquez, 2021), persuasive technologies are designed to interact with our brain to influence our thoughts and behaviours; they co-opt our human tendencies to attract (and train) our attention, emotions, mindsets, opinions and even values. These same processes and tendencies that we use daily also carry over and affect technology-enabled teaching and learning.

New digital and mental habits that alter our behaviour as digital learners are reinforced. Other potential challenges in the digital space are also related to the vast amount of information available on online platforms, its problematic quality and validity, and the deliberate misinformation, disinformation, sensationalism and fake news, all contributing to digital disorder (Weinberger, 2007). Pegrum and Palalas (2021) also warned about the effects of digital distraction and distractibility that negatively impact learners' attentional capacity and mental health. The resulting digital disarray may be further exacerbated by digital disconnection "with digital users being superficially present online but in actuality disconnected from the self … and, relatedly, from others" (Pegrum & Palalas, 2021, p. 3). In the videoconferencing setting, learners are vulnerable to the risks of the often undependable information ecosystem and the digital platforms that house it. These unprecedented physical, mental and social challenges are exacerbated by fast-changing technology. They are often combined with more "traditional" challenges such as technical difficulties, limited digital literacy skills, low learner capability and confidence levels, temporal challenges, motivational and emotional impediments, lack of support and barriers, which reduce access and the ability to participate (Irawan et al., 2020).

On the other hand, the same technologies offer various benefits, often supporting social and emotional connectedness (Palalas et al., 2022). With this vast spectrum of affordances and implications, we questioned how we could design online learning practices and create learning spaces that minimise the harmful consequences of digital technologies and maximise their benefits of access and connection to others and resources for all learners. As we aim to create inclusive learning environments conducive to learners' growth and minimise digital disarray in this volatile sociotechnical space, we should consider what learning design decisions, practices and choices are within our control, which are individual choices of learners and which are environmental factors – institutional or systemic barriers external to the course design yet impacting learners individually and collectively. To what degree is digital wellness the responsibility of the learning designer or, rather, a shared responsibility?

Methodology

To interpret meaning and extract evidence-based videoconferencing guidelines for online distance learning facilitators and designers in higher education contexts, this study builds on a qualitative, three-phased systematic review (Palalas et al., 2022). Drawing from the primary research examined in the previous two phases of analysis, this third phase of exploration aimed to address the following question: What are the inclusive design considerations that promote digital wellness in videoconferencing learning environments?

Systematic review

Our phased research design integrated eight dimensions of digital wellness – cognitive, social, emotional, spiritual, physical, digital identity, environmental and productivity – in order to understand inclusive design decisions in videoconference-enabled formal learning experiences. With this holistic framing focused on digital well-being and inclusion, we employed a systematic review to "examine secondary data by retrieving, synthesizing, and assessing existing knowledge on a subject in a logical, transparent, and analytical manner" (Martin et al., 2020, p. 1613). Furthermore, to reduce bias and draw reliable conclusions, we incorporated the preferred reporting items for systematic reviews and meta-analyses (PRISMA) to explore empirical research findings and address our research question (Page et al., 2021).

Based on the previous two phases of this exploratory study, which explored temporal themes and digital wellness in videoconferencing learning spaces from articles published between 2011 and 2021 (Palalas et al., 2022), we found that evidence-based practices on inclusive learning were missing from our findings. Therefore, while maintaining the rigour of the systematic protocol, we expanded our analysis to include secondary data generated in response to the global pandemic (Tucker et al., 2021) from peer-reviewed articles published between 2020 and 2022, with specific attention given to inclusive, evidence-based practices. This addition evolved from our previous examination of articles analysed from five databases – Discover, Google Scholar, Science Direct, Springer and Taylor and Francis – of peer-reviewed

videoconferencing studies conducted in formal higher education contexts and published in English. Collectively, we concluded our searches with 412 outputs, as demonstrated in Figure 1. From these outputs, we removed duplicate articles based on the description of their titles before we assessed 126 abstracts that met our criteria. After the abstract assessment, we removed another 54 articles and distilled 72 research outputs. From these outputs, we employed Rayyan (Ouzzani et al., 2016) to evaluate and negotiate meaning for 100% interrater reliability among the three of us. Based on this process, we examined 36 articles comprehensively to inform the findings of this review.

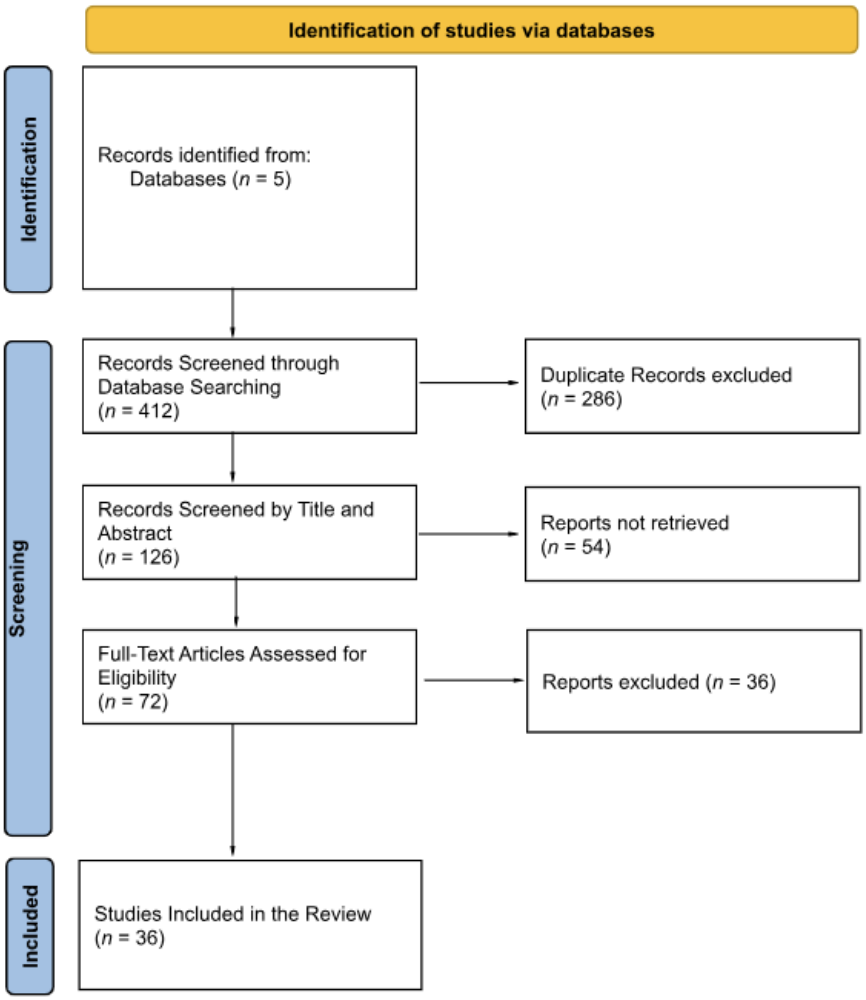

Figure 1. Summary of PRISMA protocol

Thematic analysis

We conducted an additional level of analysis using an inductive, thematic coding scheme to organise inclusive considerations for digital wellness in videoconferencing learning environments. Thematic analysis is a flexible, rigorous and iterative approach to categorising similar ideas into themes for analysis (Braun & Clarke, 2006). We followed a systematic, six-phase process, beginning with familiarising the data, then coding, theme development and refinement. Throughout this process, we ensured credibility and reliability by engaging in collaborative coding discussions and refining the themes iteratively to ensure they accurately represented the data (Nowell et al., 2017). We negotiated and interpreted six themes (Table 1) within the data corpus from the thematic analysis before re-reading each article to identify the inclusive design considerations presented in our findings.

Table 1
Themes of inclusive design considerations for digital wellness in videoconferencing

Theme	Description (References to …)
Accessibility	the practice of providing access to equitable learning experiences for all
Active learning strategies	learner-centered instructional designs that employ action and reflection to stimulate critical thinking to address relevant and meaningful ill-structured problems
Multimodal communication	inclusive modes to present information effectively
Readiness	thoughtful implementation and training to improve learner awareness, acceptance, and attitudes toward interacting in the virtual learning environment
Social presence	the feeling of connectedness
Sociocultural sensitivity	consideration and respect given to learners' unique cultural, emotional, political, economic, and social diversity

Findings and discussion

We interpreted six themes within the literature – accessibility, active learning strategies, multimodal communication, readiness, social presence and sociocultural sensitivity (Table 1) – to support inclusive design considerations in videoconferencing spaces. The following sections provide an overview of the themes, operational definitions and examples of effective evidence-based practices.

Table 2
Findings of reviewed articles

Authors (date)	Key findings	Themes of inclusive design
Alasfor (2021)	Gender considerations	Sociocultural sensitivity
Alfadda & Mahdi (2021)	Positive correlation of computer self-efficacy with technology acceptance model variables	Readiness
Amponsah et al. (2022)	Zoom fatigue affects well-being	Social presence
Arellano-Soto & Parks (2021)	Multimodal resources support meaning and build rapport	Multimodal communication, Social presence
Bedenlier et al. (2021)	Webcam behaviour is related to personal preferences and course and population characteristics	Active learning, multimodal communication, social presence
Boardman et al. (2021)	Learners may feel less connected to each other but more connected with their instructors	Social presence
Bower et al. (2015)	Learners report increased active learning with appropriate videoconferencing tools and learning design	Active learning, multimodal communication, social presence
Castelli & Sarvary (2021)	Webcam behaviour is related to personal preferences and Internet connectivity	Active learning, multimodal communication, social presence
Cesare Schotzko (2020)	Videoconference tools demonstrate distance between participants	Sociocultural sensitivity, social presence
Darr et al. (2021)	Fully videoconference learning results in a significant decline in student performance	Active learning, multimodal communication
Dhala & Johnson (2021)	Feminist pedagogies can support online graduate learning	Active learning, social presence
Dolamore (2021)	Zoom functionalities may enhance accessibility for all students	Accessibility, multimodal communication
Espinet et al. (2020)	Recommend evidence-based strategies and practices in online settings for improving professional learning	Readiness
Falloon (2012)	Students perceive quality associated with tasks, tools, media and technical factors	Accessibility
Franz et al. (2021)	International students identify meaningful use of technology, clear course objectives, group and community development and instructor expectations as valuable characteristics	Readiness, social presence
Joia & Lorenzo (2021)	Instructors' digital competency and metacognitive support are significant factors	Multimodal communication, readiness, sociocultural sensitivity
Katz & Kedem-Yemini (2021)	Identified six communication strategies to develop understanding and support positive emotions	Multimodal communication, social presence, sociocultural sensitivity

Leiba & Gafni (2021)	Faculty view synchronous online teaching as best suited for small-group interactions, though they struggle with limitations in pedagogy, resources, ethical issues and student engagement	Accessibility, readiness, social presence
Lieser et al. (2018)	Incorporating a modularised, blended learning approach supports synchronous and asynchronous learning; limited internet access and technological resources remain challenges	Accessibility, active learning
Maimaiti et al. (2021)	Highlights effective engagement strategies, such as aligning goals between students and teachers, utilising breakout rooms and webcams, enhancing non-verbal cues and fostering clear online role expectations	Multimodal communication, social presence
Mpungose (2021)	Lecturers found Zoom effective for fostering synchronous online learning, and suggest strategies to minimise digital fatigue, encourage learner autonom, and strengthen emotional connections	Active learning strategies, readiness, sociocultural sensitivity
Pal & Patra (2021)	Results show that student perception and use of video-based learning are strongly positive, with individual traits influencing usage more than technology characteristics, and the model explaining 64.6% of usage variance, moderated significantly by gender but not by digital inequality	Accessibility, readiness
Peper et al. (2021)	Strategies to support learning include maintaining visibility on camera, using expressive gestures, creating a dedicated environment and posture for focus, minimising multitasking and managing arousal and eye strain	Multimodal communication, social presence
Saldanha et al. (2021)	Building community, setting norms, and managing videoconferencing features like screen sharing, chat and breakout rooms in online courses require careful planning and institutional support to enhance engagement and minimise fatigue	Active learning strategies, social presence
Sharma & Saini (2022)	Perceived ease of use and facilitating conditions significantly impact instructor intentions, which may affect actual usage, with self-efficacy also playing a moderating role	Readiness
Sobaih et al. (2021)	Results indicate that videoconferencing tools improved students' access to resources and positively impacted knowledge-building, though limited support, participation and feedback were noted	Access, active learning strategies, readiness
Souhila (2021)	Key recommendations include onboarding students in videoconferencing use and expectations to enhance Zoom-based learning experiences	Active learning strategies, readiness
Sufirmansyah et al. (2021)	Students preferred Google Meet because it offers greater accessibility by requiring less random access memory, consuming less data and allowing access directly through a browser without needing to download an app	Accessibility
Tonsmann (2014)	Students were able to engage effectively in synchronous education through multiple means and functions within the videoconferencing platform	Accessibility, multimodal communication

Vandenberg & Magnuson (2021)	Student attitudes toward online synchronous learning are negative compared to in-person experiences in nursing education	Readiness, social presence
Vu & Fadde (2013)	Students prefer text interaction such as chat or backchannels during synchronous online learning events	Accessibility, multimodal communication, social presence
van Vuuren & Freisleben (2020)	Developing safe learning environments for students enables feelings of social presence and increases opportunities to engage online	Active learning, multimodal communication, social presence, sociocultural sensitivity
Wagner et al. (2016)	Videoconferencing enhances academic integrity through three key benefits: fostering faculty presence and personal connections, enabling work authentication and facilitating regular assessment of student progress	Social presence
Wang & Chen (2010)	Collaborative learning can be effectively implemented	Multimodal communication, social presence
Zulherman et al. (2021)	Self-efficacy affects the facilitation of learning in videoconferencing events	Readiness

Accessibility

The term *digital divide* is a multidimensional construct that has evolved beyond mere access to technology and encompasses disparities in digital literacy, Internet quality and socio-economic factors (van Dijk, 2020).

In this study, we define accessibility as enabling equal learning opportunities. We recognise that technology-dependent learning, including tools such as videoconferencing, disproportionally impacts populations facing multidimensional barriers, such as individuals with limited digital proficiencies or those who reside in rural or lower-income households (Lythreatis et al., 2022). For example, not all participants can access robust Internet connection speeds, creating unique design considerations for videoconferencing-enabled learning. As presented by Sufirmansyah et al. (2021), limitations in network access, data plans and storage devices prevent students from engaging in high-quality learning experiences through videoconferencing platforms. In addition, participation may be limited to asynchronous activities due to the lack of available bandwidth, limiting learners' engagement with the course content, their peers and their instructors. For example, in a partner-pair learning activity, one partner may experience network issues that disrupt their learning and their partner's learning, thus diminishing the activity's learning objectives. Therefore, learning designs should incorporate flexible learning activities that can operate on a spectrum of fidelities, including mobile technologies that utilise other forms of access to accommodate all learners. The length of synchronous videoconferencing sessions, which, according to Falloon (2012), could range from 30 minutes to 180 minutes, often hinders continued access to the learning environment for those experiencing reduced access. Pal and Patra (2021) have suggested that video sessions should be conducted in short durations to reduce fatigue and be accessible on mobile and desktop devices to provide optimal resolution for those with limited data plans and Internet access.

In addition to the digital divide, Leiba and Gafni (2021) recommended that course designers evaluate learners' diverse needs and abilities, including attention and concentration disorders, physical impairments and second language learners. Dolamore (2021, p. 377) claimed that "most technology platforms for hosting classes assume the attendees' hearing status and visual preference". Therefore, assistive technologies are required to support equitable learning experiences in the learning process. Other tools and videoconferencing functions such as spotlight, speaker view, share screen and backchanneling techniques allow learners of all abilities to engage with the material equitably. In addition, course designers should embed accessibility functions and third-party technologies into videoconferencing platforms before all learning experiences to ensure equitable access for all learners. Finally, Bower et al. (2015) suggested that videoconferencing interfaces should be adaptable to meet the educational and interactional needs of an evolving and diverse population.

Active learning strategies

An essential dimension to effective online learning, including videoconferencing modalities, is the inclusion of active learning instructional strategies. According to Heiser and Ralston-Berg (2018), active learning strategies are instructional designs that incorporate action and reflection to stimulate critical thinking and offer solutions to ill-structured problems. Dhala and Johnson (2021) recommended learning activities that enable reflection and then engage learners to articulate their expressions in relevant, meaningful and creative forms, such as poetry, to demonstrate their learning. Lister et al. (2018) have argued that active learning strategies are inherently embedded in the learning process through videoconferencing technologies. For example, instructors should model effective facilitation in videoconferencing learning environments and create opportunities for learners to practice online facilitation in group work for all participants to improve their communication skills (Souhila, 2021) and witness instructional strategies by their peers and instructors (Bedenlier et al., 2021; Saldanha et al., 2021). Active learning strategies may also incorporate integrated videoconferencing functions such as polling tools, discussion boards, shared resources and cooperative annotations to support student preferences and abilities while enabling more equitable learning opportunities (Castelli & Sarvary, 2021).

Our analysis identified themes suggesting that course designers embed multimodal interactions in the videoconferencing learning environment to support action and reflection in their learning designs.

Multimodal communication

Learning technologies applied in online distance education can enable learners and facilitators to communicate information across multiple modes or with a combination of modes to deliver meaning. Specifically, videoconferencing learning environments offer advantages to incorporating multimodal media enrichment (Bates, 2008), and course designers make equitable decisions to apply appropriate technologies to optimise learning (Heiser & Ralston-Berg, 2018). Further, Bower et al. (2015) claimed that the diverse representation afforded by different modalities can address each learning opportunity's cognitive and collaborative requirements as well as equity and access. Incorporating multiple modalities in course design and development supports the needs of diverse learners, including their preferences and abilities, thus creating a more inclusive learning experience. According to Dolamore (2021, p. 377), incorporating multimodal communication in videoconferencing learning environments "allows walls of exclusion to become bridges of opportunity".

Videoconferencing is an example of a multimodal communication digital tool that hosts audiovisual stimuli in real time to engage learners to interact with content, their peers and the instructor (Maimaiti et al., 2021). By combining multimodal tools, including video cameras, whiteboards, chat functions, visual images, audio communication, translation technologies and text-based learning materials in videoconferencing settings, Arellano-Soto and Parks (2021) suggested that multimodal communication enhanced learners' ability to negotiate meaning, improve socio-affective degrees to build rapport and support language learning. However, multimodal communication is predicated upon learners being aware of and comfortable using these diverse resources and modes to enhance their learning opportunities (Dolamore, 2021). Further, Maimaiti et al. (2021) cautioned that too much multimodal stimulation can cause fatigue and cognitive overload, ultimately disengaging learners if not thoughtfully or purposefully designed. Building upon Maimaiti et al., Döring et al. (2022) suggested that the over-extension of modality management skills could potentially lead to greater instances of exhaustion and fatigue with videoconferencing sessions, which may result in a significant decline in student performance (Darr et al., 2021). Katz and Kedem-Yemini (2021) also found negative consequences to multiple dimensions of interpersonal communication. Specifically, learners and instructors perceived fewer cues to communicate, less availability to provide or receive feedback and a feeling of reduced personalised interaction. Conversely, learners and instructors found value in documenting videoconferencing sessions for later reference to support access and learner preferences (Joia & Lorenzo, 2021; Tonsmann, 2014). Finally, as an interdisciplinary research team, we believe videoconferencing learning designs require intentional pedagogical and technological decisions in which essential content and learning activities are prioritised for meaningful learning processes and outcomes.

Readiness

Informed by the literature, we define *readiness* for videoconferencing-enabled learning in higher education as thoughtful implementation, orientation and training to improve learner awareness, acceptance and attitudes towards interacting in the virtual learning environment (Nguyen et al., 2021; Sobaih et al., 2021). According to Pal and Patra (2021) and Souhila (2021), learners perceive their characteristics and the user interface of the digital platform as significant indicators of the effectiveness of the videoconferencing-enabled learning experience. Similarly, Sharma and Saini (2021) found that the same readiness indicators apply to instructors and course developers in evaluating videoconferencing solutions for implementation.

Faculty development, onboarding and training are essential for preparing learners and instructors for videoconferencing, helping reduce cognitive overload, easing emotional strain and maintaining motivation. To support readiness, scholars suggest that training and onboarding activities are effective practices for learners to increase their understanding, self-efficacy and motivation in video-based learning (Alfadda & Mahdi, 2021; Zulherman et al., 2021). For example, task-oriented activities are perceived as

more valuable than highly technical and static training resources (Espinet et al., 2020; Franz et al., 2021). Also, instructors should explain the purpose of the videoconferencing tool in meeting intended learning outcomes. Furthermore, from a systems perspective, professional and administrative staff must navigate these challenges and solutions. For learners and instructors to achieve the intended outcomes, professional and administrative staff must be able to create the conditions and holistically support the learning process through institutional culture, readiness and resources (Pal & Patra, 2021; Sharma & Saini, 2021; Vandenberg & Magnuson, 2021).

Our findings in this theme suggest that institutional stakeholders should integrate readiness and implementation frameworks to support comfort levels and fully leverage the affordances of videoconferencing technologies. Mpungose (2021) presented a framework for instructors to incorporate critical, technical and practice reflection, which can offset digital fatigue and regain feelings of autonomy and emotional connectedness. He categorised technical reflection as subject-level needs, such as course content and learning activities; critical reflection as personal needs, including self-identification and self-direction; and practical reflection as macro-level needs of society, including access to technologies and socio-economic factors used to provide practical interventions to the implications of distance digital learning. Expanding on this framework, we believe reflective practices should include all critical stakeholders in higher education, not only instructors.

Social presence

This theme is illustrated by Boardman et al. (2021, p. 25), who stated that "humans want to have a feeling of connectedness with each other". Genuine interactions may be fostered using video cameras and microphones, making students feel more motivated and confident to participate in online instruction and interaction (Boardman et al., 2021). In addition, Vu and Fadde (2013) suggested incorporating chat features and break-out rooms to foster collaboration and conversation among learners. Encouraging student exchanges within these modalities allows learners to discuss and backchannel questions on the course content and enables lectures to progress without interruptions.

Activities to facilitate the development of social presence may include icebreakers and active learning strategies such as role-play or group learning experiences (Saldanha et al., 2021) designed to support collaboration, interaction and learner autonomy. Even though videoconferencing can enhance social presence, not all studies support this claim. For example, Vandenberg and Magnuson (2021) found that a significant population in their study reported a perceived lack of social presence in videoconferencing learning environments. Amponsah et al. (2022) indicated that videoconferencing fatigue is emotionally and mentally draining, impacting both the body and the mind. We can deduce from these findings that more intentional learning designs are necessary for effective learning and instruction in videoconferencing learning environments. Our analysis demonstrates that videoconferencing learning design strategies include shorter session durations, frequent breaks, dialogic exchange, informal and authentic interactions and active learning strategies that promote a more inclusive and collaborative learning environment. Developing social presence through these methods allows learners to feel a sense of connectedness and purpose within their learning environment and fosters open emotional and cognitive communication (Boardman et al., 2021; Dhala & Johnson, 2021; Katz & Kedem-Yemini, 2021). Palalas et al. (2022) also found that digital wellness is more apparent in learners who continually engage with others in social conversations, leading to collaborative, safe and respectful online environments.

Sociocultural sensitivity

Creating an inclusive videoconferencing environment requires course designers to recognise and appreciate learners' diverse cultural, emotional, political, economic and social backgrounds. We refer to this process as *sociocultural sensitivity*, which involves showing consideration and respect for the unique characteristics of each learner. By acknowledging and accepting these differences, course designers can develop an environment that is supportive and adaptable to various contexts. The literature analysed in this theme suggests that each student's unique social and cultural characteristics should be considered

during videoconference-enabled learning settings (Alasfor, 2021; Cesare Schotzko, 2020; Joia & Lorenzo, 2021; Katz & Kadem-Yemini, 2021).To foster an inclusive learning community, Dhala and Johnson (2021, p. 171) recommended developing an interactive space where all participants feel valued and respected while "ensuring there are no essentialist claims to the classroom and that it 'belongs' equally to all participants". Engaging diversity through student facilitation highlights differences in tradition, culture, background and personality while encouraging participants to develop a respectful and collaborative environment.

Alasfor (2021) has drawn attention to the social barriers within gender-segregated institutions and advises instructors to allow the optional use of the video camera when instructing learners of the opposite gender. To facilitate female students' social presence, satisfaction and comprehension, they explored the choice of sharing the video camera of the opposite gender, thus encouraging sociocultural sensitivity. According to Joia and Lorenzo (2021), course designers should assess the climate and context of the learning environment in order to tailor an inclusive learning experience. Furthermore, video cameras in online learning can reveal personal information and situations that learners may be hesitant to share, such as living arrangements, family obligations and societal restrictions. As a result, instructors must be aware of their learners' environments to avoid creating social barriers that expose their financial insecurity or social status. Van Vuuren and Freisleben (2020) argued that videoconferencing enables a curious intimacy between participants, often resulting in vulnerability as learners see themselves and their surroundings on a live feed. Disclosing these hidden intimacies leads to feelings of embarrassment and discomfort for learners and hinders their full engagement in the course content (Cesare Schotzko, 2020, p. 274). In light of this design challenge, Katz and Kadem-Yemini (2021) stressed the importance of showing empathy towards diverse and confidential learning situations, as well as being flexible when it comes to active participation during synchronous sessions. They argued that different perspectives can enhance communication and impact students' emotional and cognitive comprehension. Our analysis of this theme aligns with the recommendations identified in the multimodal communication theme. Accordingly, learners should be provided multiple interaction channels in synchronous learning while keeping their unique learning context private.

Recommendations

The insights from this systematic review have informed a set of guiding questions for course designers aimed at promoting inclusive learning in videoconferencing settings. Ideal inclusive learning design builds upon foundational principles of effective pedagogical design, which involves understanding the audience, providing opportunities for choice and voice and adhering to the less is more philosophy. The ability of videoconferencing technologies to connect participants across time zones and geographical boundaries should lead to design considerations which respect potential accessibility constraints and encourage learners' meaningful participation. Course designers should seek ways to utilise needs assessments, data-informed personas and low-stakes formative assessments to make informed design decisions that cater to the needs and expectations of learners. We have distilled insights from the review into guiding questions designed to facilitate digital wellness and inclusivity. Does your learning design:

(1) offer choice to learning activities that support universal design for learning (CAST, 2024) considerations?
(2) moderate technology and digital barriers and promote ease of access for a simple and satisfying user experience? (Alfadda & Mahdi, 2021; Sharma & Saini, 2022)
(3) encourage balanced engagement that holistically respects learners' preparedness and circumstances, including cognitive, social, emotional, spiritual, physical, digital identity, environmental, and productivity aspects? (Amponsah et al., 2022; Franz et al., 2021)
(4) support functional shared spaces with the feeling of safety within the learning community based on interdependence and reciprocity? (van Vuuren & Freisleben, 2020)
(5) promote and stimulate connections and communications in formal and informal conversations (i.e., dialogue and feedback) to diminish isolation and disengagement? (Boardman et al., 2021; Katz & Kedem-Yemini, 2021)

(6) provide support, training and guidance that foster confidence to aid anxiety and low self-efficacy? (Mpungose, 2021; Zulherman et al., 2021)
(7) incorporate technological features (i.e., video chat function) in a purposeful way that benefits learners holistically? (Bower et al., 2015; Maimaiti et al., 2021)
(8) communicate roles and responsibilities within the community of learners so that all responsibilities and expectations are transparent? (Espinet et al., 2020)
(9) build in negotiated flexibility within the structure that allows for adjustment to meet the needs and expectations of all? (Pal & Patra, 2021)
(10) reduce complexity and infuse simplicity with a clear sense of purpose and scaffolded instruction? (Falloon, 2012)
(11) include pedagogy of care and empathy? (Burke & Larmar, 2021)
(12) lessen stress by planning and communicating contingency plans? (Saldanha et al., 2021)

These guiding questions are crafted to support all stakeholders in developing learning experiences that are inclusive, accessible and equitable, aligning with current research in online distance education. Given the identified need for choice and flexibility in activities, formats, media and access requirements, we recognise that learners require varying degrees of technological adaptations and training, particularly in digital literacy. To support diverse learners, it is essential to maintain a healthy balance of interdependence and independence. Therefore, we believe that individual learners are best equipped to regulate their own choices and activities in pursuit of digital wellness. Ensuring learners' digital wellness involves their ability to reflect on the cognitive and social-emotional aspects important to both them and their learning community and make thoughtful choices about these aspects. By developing their autonomy and supported decision-making skills, learners can enhance their well-being on a global scale, not just within a videoconferencing environment. Digital wellness is a shared responsibility: we create an environment and practice that do not supersede learners' autonomous choices but guides them to understand and be aware of their practices and whether they are good for their learning. However, as previously mentioned, these instructional efforts necessitate conditions and holistic support at the organisational level – possibly a cultural shift at institutional and governmental levels. Although challenges remain, purposeful learning design considerations can mitigate issues and support digital well-being for all learners.

Conclusion

Building on previous findings (Tennyson & Park, 1980) that emphasised the need for appropriate pedagogical strategies in effective learning design, this research examined and synthesised evidence-based practices specific to videoconference-enabled learning in higher education to promote digital well-being. This article reports on our third phase of a systematic review and identifies six themes to guide inclusive learning design and wellness considerations in videoconferencing learning environments. Using a thematic analysis, our findings suggest that course designers should consider accessibility, active learning strategies, multimodal communication, readiness, social presence and sociocultural sensitivity dimensions to support the well-being of all learners. Balancing the interplay of digital technology and pedagogy, we offer evidence-based guiding questions for course designers and instructors to integrate into their learning designs to create the conditions for effective learning practices and to address the facets of digital well-being. Ideal inclusive learning designs provide learner agency and equity of access to support the co-creation of knowledge and promote safe communications which cater to the holistic needs of all.

Furthermore, our findings suggest that digital well-being is a shared responsibility. Across an institution, learners, faculty, professional staff and institutional leaders should feel empowered to make informed choices about their digital habits. Videoconferencing offers numerous affordances that promote inclusive experiences for learners while providing opportunities that cater to the holistic aspects of digital well-being. Innovative measures that encourage collaboration, conversation and the co-creation of effective practices are beginning to shift digital technologies towards a more human-centred focus (Baran &

AlZoubi, 2020). If leveraged appropriately, these practices have the potential to move open, digital and distance education to the forefront of innovative and inclusive educational practices.

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