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Editorial / Éditorial Volume 49 Issue 3

***Martha Cleveland-Innes**, Editor-in-Chief*

Welcome to volume 49, issue 3 of *The Canadian Journal of Learning and Technology* (CJLT). CJLT is a decades-old peer-reviewed journal that invites English or French submissions on the research and practice of education, technology, and learning. This bilingual journal is free-of-charge to anyone with access to the Internet, is multi-indexed, and presented in accessible formats. There are no article submission/publication fees or access charges.

CJLT's history dates back to where distance education was an innovation characterized by portable print-based material and non-digital technologies. This issue's Notes section is presented by Dr. Olaf Zwacki-Richter. Here, he reviews the history of distance education with a view to current pressures on teaching and learning. *The Origins of the Term Distance Education and the Roots of Digital Teaching and Learning* is both articulate and accurate. It provides an inspiring view of new ways to define and use concepts of Open, Distance, and Digital Education (ODDE), based on historical education milestones. This prepares readers with a lens to the research articles which follow.

The human experience is the red thread the runs consistently through the research, results, and recommendations reported here. Practices of language teaching and learning additionally tie the first two articles together. Article one, *The Uses of X/Twitter by Members of the TESOL Community*, compares uses within and across groups and identifies the scope of this social media tool. Although specific to higher education and the teaching of English to speakers of other languages (TESOL), any purposeful community using X/Twitter can experience connection. Further research is required. Congratulations to Kent K. Lee, Marilyn L. Abbott, Shiran Wang, and Jacob Lang of the University of Alberta, Canada.

The experience of technology supported synchronous feedback for language learners is the topic of article two. *Learners' Perceptions of Synchronous Written Corrective Feedback in Videoconferenced Collaborative Writing* has a long but descriptive title. Authentic assessment and student direction and redirection is a current topic of significant research and discussion. This research looks specifically at synchronously written corrective feedback (SWCF) in online collaborative writing. This exercise uses an online text-editing platform mediated by synchronous videoconferencing. Results gathered through a mixed methods research process indicate that learners viewed the exercise as effective. This learner experience allows for a review of the

broader pedagogical implications for this blended formative assessment. Thank you, Kevin Papin of Université du Québec à Montréal and Gabriel Michaud, Université de Montréal, Canada, for this valuable work.

Beyond the context of distributed learning engagement in the first two articles, the next two articles report research about in-person learning and technology. Despite the increased "use of digital media and tools for online learning in the mainstream education" (Zwacki-Richter, 2024, p. 1) during COVID-19, in-person teaching and learning remains commonplace. Technology in the classroom is still in need of study.

Evaluating technology in the K-12 classroom is the theme in article 3, *A Collaborative Story Writing Project Using Google Docs and Face-to-Face Modality*. Unique is the blend of synchronous and asynchronous use of Google Docs where cloud-based writing collaboration is available. The setting is a high school English class. Students are instructed to work in groups – while together in-person and outside of class while apart. This qualitative study offers a review and recommendations for collaborative tools in high school and beyond. Thank you for this excellent contribution, Deirdre Wilson of Vancouver Island University, Canada.

Technology-enabled learning is available in higher education classrooms. However, the use of technology supported games for learning, well researched in the K-12 setting, will apply uniquely to higher education. Student development through games is the theme for article 4, *Exploring Students' Perception of Quizizz as a Learning Media in Higher Education.* Student perceptions of the game-based software Quizizz are identified through qualitative and quantitative data collected via mixed methods. Findings suggest an increase in engagement, independence, and self-control. As satisfaction is known to enhance learning, the enjoyment and a sense of self-confidence can be considered valuable. Thank you Harun Sitompul, Universitas Negeri Medan, Retno Sayekti, Universitas Islam Negeri Sumatera Utara, Sri Rahmah Dewi Saragih, Universitas Asahan, and Salminawati, Universitas Islam Negeri Sumatera Utara, all of Indonesia.

The human experience of digital forms, for learning and beyond, impacts our health and wellness. Research literature reports that online learners can experience burnout, stress, fatigue, sleep deprivation, cognitive overwhelm, and work-life imbalance. While not unique to online learners, these afflictions are of a particular kind and require remedies that address their uniqueness. Article 5 outlines a developing *Digital Wellness Framework for Online Learning.* Research about the whole person digital experience notes a positive and negative impact. This debate recognizes teaching and learning practices that contribute to the holistic wellbeing of learners, beyond content outcomes. These practices are drawn from secondary data analysis of an online design. DW-FOLD: Digital Wellness Framework for Online Learning suggests more intentional use of online technology and pedagogy in ways that ensure 1) active and meaningful learning 2) for the good of the whole learner, and 3) all learners. Congratulations on this publication to Aga Palalas and Mae Doran of Athabasca University, Canada.

And finally, this issue includes a thorough and detailed review of a special kind of book: *Self Talk: Musing on Distance Education, 2023.* The book mirrors the topic of the Notes submission

discussed earlier by presenting a collection of blog posts and reflective writings about distance, open, and online learning. The author is a familiar name to many of us and a seasoned, credible scholar in our field: Dr. Sanjaya Mishra. His writing spans the developments in distance education and the changing roles of teachers and students, based on lessons learned from engagements at the Commonwealth of Learning, where the author has worked for many years. Both the book review and the book are reommended reading for scholars and practitioners. Special thanks to the exceptional book reviewers, Dr. Sayantan Mandal and Sheriya Sareen of the Indian Institute of Technology Jammu, India.

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The Origins of the Term *Distance Education* and the Roots of Digital Teaching and Learning

Les origines du terme enseignement à distance et les racines de l'enseignement et de l'apprentissage numériques

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Introduction

By no means is the digitalization of learning and teaching a new phenomenon (cf. Inglis, et al., 1999). Since the 1960s and 70s, open and distance teaching universities have spearheaded new and emerging technologies to bridge the distance between students and teachers. Since the turn of the millennium, online learning has spread worldwide, particularly in countries with a long tradition of distance education (e.g., Canada, Australia, India, or South Africa, see Qayyum & Zawacki-Richter, 2018; Zawacki-Richter & Qayyum, 2018). Online study programs have also been increasingly established at campus-based universities. In 1999, Alan Tait observed that the boundaries between distance teaching and conventional campus-based universities were blurring: "The secret garden of open and distance learning has become public, and many institutions are moving from single conventional mode activity to dual mode activity" (Tait, 1999, p. 141).

Since Spring 2020, the COVID-19 pandemic has boosted the use of digital media and tools for online learning in the mainstream education. However, the transition to online learning has often been *ad hoc* to maintain study operations. Emergency remote teaching was coined for this practice, which differs significantly in quality from carefully designed online learning and teaching (Bozkurt & Sharma, 2020; Hodges et al., 2020). Concepts from face-to-face teaching were often transferred directly, which led to the excessive use of synchronous video conferencing systems, for example. Nichols (2023) criticizes that everything is now *online*: “It is unfortunate, though, that this shift became popularly known as a move to ‘online’ and even ‘distance’ education” (p. 142).

Due to these terminological confusions, this research note will first discuss the definition(s) of *distance education,* and then the term’s emergence will be reconstructed from a historical perspective, representing the roots of current forms of education in the context of the digital transformation.

Excursus

Definition of Distance Education and the Transition to New Forms of Digital Education

After the foundation of the first open and distance teaching universities in the 1960s and 70s, the field of distance education developed and matured as a scholarly discipline of its own (Delling, 1971), which led to the establishment of dedicated academic journals, such as *Distance Education* (1980, Australia), the *American Journal of Distance Education* (1986, USA), the *Journal of Distance Education* (1986, Canada), and *Open Learning* (1986, UK). In the inaugural issue of *Distance Education*, Desmond Keegan proposed a definition of distance education that he revised for his book "Foundations of Distance Education" (Keegan, 1980, 1986).

In the second half of the 1980s, there was a lively discussion about the definition of distance education until Rumble (1989) presented a five-part definition based on the debate:

1. "In any distance education process there must be: a teacher; one or more students; a course or curriculum that the teacher is capable of teaching and the student is trying to learn; and a contract, implicit or explicit, between the student and the teacher or the institution employing the teacher, which acknowledges their respective teaching-learning roles.
2. Distance education is a method of education in which the learner is physically separate from the teacher. It may be used on its own, or in conjunction with other forms of education, including face-to-face.
3. In distance education learners are physically separated from the institution that sponsors the instruction.
4. The teaching/learning contract requires that the student be taught, assessed, given guidance and, where appropriate, prepared for examinations that may or may not be conducted by the institution. This must be accomplished by two-way communication. Learning may be undertaken either individually or in groups; in either case it is accomplished in the physical absence of the teacher.
5. Where distance teaching materials are provided to learners, they are often structured in ways that facilitate learning at a distance." (p. 18)

This definition can be seen as the preliminary conclusion of the efforts to define distance education as a professional field of practice in higher education during its founding phase.

> Open and distance learning are often used synonymously, however, the concept of open learning is different from distance education since it embraces the idea of students being able to take courses or programs without prerequisites and being able to choose to study any subject they wish. Indeed, most of the 'Open Universities' were founded upon this basic premise. While some distance education programs may involve open learning, most do not. (Moore & Kearsley, 1996, p. 2)

With the emergence of new educational technologies and media, the proliferation of personal computers, and, most importantly, the Internet, new modes of delivery were developed that were also adopted by conventional educational institutions (see Tait, 1999). Since the turn of the millennium, new terms such as e-learning, online learning, blended learning, hybrid learning, technology-enhanced learning, and flexible learning have come to the fore. With the ever-evolving new media and technologies for teaching and learning, the field of practice and research is a moving target.

For a recent handbook, Zawacki-Richter and Jung (2023) chose the title "Open, Distance, and Digital Education" (ODDE), combining open and distance education to mark the historical origin of recent online education and digital education to capture newer manifestations of teaching and learning with digital media in the process of digital transformation of educational institutions:

> We conceptualize ODDE as an overarching term to refer to all kinds of learning and teaching processes in which knowledge and skill base of educational technology, digital media, and tools are used to present and deliver content, as well as facilitate and support communication, interaction, collaboration, assessment, and evaluation. Thus, ODDE is not monolithic in form. It includes various types, from technology-enhanced education to flipped learning and blended learning, and to fully online education. (p. 6)

It has been criticized that we have not succeeded in maintaining a coherent definition of ODDE throughout the handbook (Olivier, 2023). On the one hand, this was hardly possible with over 100 authors of the handbook, but on the other hand, it also illustrates very well the fuzziness of this multifaceted term.

Origin of the Term Distance Education

The origins of ODDE go back to correspondence education in the middle of the 19th century, in which teachers and students communicated via written text, and the course content was delivered via printed study letters (see Moore, 2023). The International Council of Correspondence Education (ICCE) was founded in 1938. The name of the ICCE was changed at the World Conference, which took place in Vancouver in 1982, to the International Council of Distance Education (ICDE). In the reminiscences on the origin of the term distance education, Shattuck (2023) provides an email correspondence between Otto Peters and Michael G. Moore. In the early 1970s, Otto Peters was already a professor of education focusing on distance learning research and became the founding rector of the FernUniversität in Hagen (Germany) in 1975. Michael G. Moore, around that time, joined Charles A. Wedemeyer as his research assistant at the University of Wisconsin-Madison (USA). Moore explains that Wedemeyer initially advocated the term *independent learning*, but then, as president of the ICCE, favored changing the name to ICDE (Shattuck, 2023).

In a recent interview (Zawacki-Richter, 2024), Otto Peters explains how and why he invented the term *distance education*. In 1969, Peters moved to the DIFF[1] in Tübingen, where he led the "Distance

[1] Deutsches Institut für Fernstudienforschung, German Institute of Distance Education Research

Education Abroad" department and finished his Ph.D. with Günther Dohmen. In this capacity, it was one of his duties to draft papers for European Union meetings preparing the establishment of open and distance teaching universities in the member states:

> While carrying out this work, it crossed my mind that English-speaking countries did not distinguish distance teaching (in the secondary area) and distance studies (in the tertiary area). The usual designation here for distance studies at universities was, therefore, the same for both school and commercial courses, namely "correspondence study." However, I did not want to use the term correspondence study in my conference papers because in several countries, above all in the USA, it was a reminder of severe commercial misuse and, for this reason, no longer had a positive image. It would be unfortunate if the new academic distance studies that we had in mind and wanted to promote were to suffer due to its negative connotation. However, there was no English word corresponding to the German *Fernstudium*, which was why I set about "inventing" an appropriate English term without further ado. I assumed this would be very simple because I needed to translate the German word *Fernstudium* freely for my use in English. My suggestion was to translate it as "distance education." (Zawacki-Richter, 2024, p. 84)

In the following decade, the term *distance education* became increasingly widespread at international conferences and in education policy papers of the European Union, which ultimately also led to the establishment of the term in North America and the name change of the ICCE to ICDE in 1982.

Conclusion

We can benefit from decades of research, theory, and practice in the field of distance education to inform new developments in digital teaching and learning. Xiao (2018) reminds us that "campus-based universities with the intention of jumping on the bandwagon of distance education should not ignore the history of distance education. Instead, they should learn from its successes and avoid the mistakes it has made" (p. 12).

Therefore, it would be desirable to see more research and reflections on the history and development of distance education. In this commentary, I have underscored the terminological origins. With the dynamic development of digital forms of learning and teaching, a further conceptual sharpening of the field, which I would describe as ODDE, is warranted and necessary.

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The Uses of X/Twitter by Members of the TESOL Community

Les utilisations de X/Twitter par les membres de la communauté TESOL

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Abstract

A lack of dialogue and collaboration between researchers and practitioners has been recognized in the field of second language education. Social media platforms such as X/Twitter have potential for connecting professionals in the teaching of English to speakers of other languages (TESOL) community and supporting professional learning and research; however, studies of TESOL professionals' uses of X/Twitter have only examined posts/tweets from a limited number of communities marked by hashtags/ keywords. This study identified 23 hashtags relevant to TESOL instruction for adults in the Canadian context and used them as search parameters to extract a data set of 4,833 posts/tweets. Eighty-two North American university professors who had published in the field of TESOL, were selected and searched for on X/Twitter. Upon locating 15 X/Twitter professor accounts, all 272 posts/tweets posted over the one-year period, were extracted. Two content analyses were conducted to infer the purpose of the posts/ tweets and identify the hashtags used by the professors. Results reveal considerable variation in the professors' and other TESOL community members' uses of X/Twitter and suggest that the two groups participate in rather separate X/Twitter communities. Recommendations for maximizing X/Twitter as a tool for professional learning and research and fostering the research-practice link are provided.

Keywords: affinity spaces, community of practice, researchers' and practitioners' uses of Twitter, social media, X

Résumé

Un manque de dialogue et de collaboration entre les chercheurs et les praticiens a été reconnu dans le domaine de l'enseignement des langues secondes. Les plateformes de médias sociaux comme

X/Twitter ont un potentiel pour connecter les professionnels de la communauté d'enseignement de l'anglais aux locuteurs d'autres langues (TESOL) et soutenir l'apprentissage professionnel et la recherche ; cependant, les études sur les usages de X/Twitter par les professionnels du TESOL n'ont examiné que les postes/tweets provenant d'un nombre limité de communautés marquées par des hashtags/mots-clés. Nous avons identifié 23 hashtags pertinents pour l'enseignement du TESOL aux adultes dans le contexte canadien et nous les avons utilisés comme paramètres de recherche pour extraire un ensemble de données de 4833 postes/tweets. Ensuite, nous avons sélectionné 82 professeurs d'université nord-américains qui avaient publié dans le domaine du TESOL, nous les avons recherchés sur X/Twitter, localisé 15 comptes X/Twitter, et extrait tous les 272 postes/tweets qu'ils avaient postés sur un an. Deux analyses de contenu ont été menées pour déduire le but des postes/tweets et identifier les hashtags utilisés par les professeurs. Les résultats ont révélé une variation considérable dans les usages de X/Twitter par les professeurs et les autres membres de la communauté TESOL et suggèrent que les deux groupes participent à des communautés X/Twitter plutôt séparées. Des recommandations pour maximiser X/Twitter comme outil d'apprentissage professionnel et de recherche et favoriser le lien entre la recherche et la pratique sont fournies.

Mots-clés: communauté de pratique, espaces d'affinité, les usages de Twitter par les chercheurs et les praticiens, médias sociaux, X

Introduction

Social media tools and platforms (e.g., Facebook, Instagram, X/Twitter) play an integral role in North Americans' lives. Approximately 89% of Canadians use at least one form of social media, spending an average of 113 minutes on these tools daily (Dixon, 2024), and as many as seven-in-ten social media users in the United States visit social media sites on a daily basis (Auxier & Anderson, 2021). Social media has been defined as "internet-based channels that allow users to opportunistically interact and selectively self-present, either in real-time or asynchronously, with both broad and narrow audiences who derive value from user-generated content and the perception of interaction with others" (Carr & Hayes, 2015, p. 50). Microblogging is one social media activity in which users can openly share their ideas as short text messages online accompanied by other multimedia content (e.g., images, videos) and hyperlinks. Users can post, comment on posts, and engage in interactive dialogues with other microbloggers. These dialogues can contribute to online professional development (Beach et al., 2021) and scholarly communication (e.g., Holmberg & Thelwall, 2014). If practitioners (e.g., teachers) and researchers have increased opportunities to participate in reciprocal dialogues about practice-related issues through microblogging, these dialogues may foster new collaborations between the two professional communities. This can result in new innovative practices that are informed by research as well as the production of additional research that contributes to meaningful practice. One of the most widely recognized microblogging platforms that has the potential to promote this type of dialogue is X, formerly known as Twitter. This social media platform is referred to as X/Twitter throughout this study as the data collection occurred before the rebranding and most of the prior research on the platform was also conducted before the rebranding.

Although researchers have examined the differential uses of X/Twitter in scholarly communication across a number of disciplines (e.g., Holmberg & Thelwall, 2014; Malik et al., 2019; Sugimoto et al., 2017; Veletsianos & Kimmons, 2016), applied linguistics was not identified as one of the disciplines. While the benefits of X/Twitter in promoting second language (L2) learning and the development of online L2 learning communities have been recognized (Lomicka, 2017), a comparison of X/Twitter use by applied linguists and other members of the TESOL community remains to be explored. An increased understanding of the current uses of X/Twitter in the field of TESOL may apprise practitioners and applied linguists/university professors of the affordances or the constraints of X/Twitter as a professional development and research tool. As such, maximizing the utility of X/Twitter might also provide direction for ways to connect these two professional communities.

Venues for "the bidirectional flow of knowledge" (Sato & Loewen, 2022, p. 512) between L2 researchers (e.g., applied linguistic professors) and practitioners are needed to generate "practice informed by theory and theory informed by practice" (la Velle, 2019, p. 369). X/Twitter can serve as a venue that facilitates this knowledge exchange. Therefore, the purpose of this study, which is part of a larger project addressing online professional learning and development in TESOL, is to identify (a) the professional uses of X/Twitter by university professors and other members of the TESOL community (e.g., practitioners), and (b) the extent of the dialogue between the two communities on X/Twitter. From this point forward, the terms researchers/professors and TESOL community members/practitioners are used to refer to these two groups. Researchers "are those who belong to universities and who are expected—to different degrees, implicitly or explicitly—to disseminate their research in the academic community" (Sato & Loewen, 2022, p. 511). Practitioners include teachers and those in related "professions and roles, such as policy makers, program directors, textbook writers, educational bloggers, and media content producers" (Sato & Loewen, 2022, p. 511). It is recognized that the categorization of TESOL community members as researchers or practitioners may present a false dichotomy, as some researchers/professors are L2 practitioners, and some classroom teachers are researchers. However, as Sato and Loewen (2022) implied, this dichotomy is useful for examining researcher-practitioner communication; therefore, it was used to examine the differences in X/Twitter use and the extent to which X/Twitter acts as a venue facilitating knowledge sharing across the two communities.

Literature Review

Dialogue Between TESOL Practitioners and Researchers

A gap between research and practice is well-recognized in the field of applied linguistics; a gap which is attributable to differences in researchers' and teachers' orientations–practical vs theoretical compounded by a lack of dialogue and collaboration between the two communities (Spada & Lightbown, 2022). Even though knowledge gleaned from research increases our understanding of the world and is crucial for constructing theories and solving real-world problems, the relevance and value of empirical research for language teachers has been questioned and the argument that teachers would be "better off" relying on intuition and professional experience and disregarding input from researchers (Medgyes, 2017) contributes to the research-practice gap. Although not all L2 studies have direct

relevance to real-world classroom issues faced by teachers, reliance on intuition and experience alone may result in the recycling of ineffective pedagogical practices (Paran, 2017). Teacher engagement with research has the potential to offset such a result. Research conducted with TESOL practitioners has demonstrated that teachers can combine knowledge gleaned from research articles with their practice-based knowledge to co-construct contextually appropriate innovative practices (Abbott & Lee, 2022; Lee & Abbott, 2021). If practitioners engage in discussions about research to address real-world issues in their practice, and researchers engage practitioners in collaborative research partnerships and reciprocal dialogues about practice-related issues, research-practice relationships may be fostered (Sato & Loewen, 2022). Social media platforms can serve as venues for dialogue between practitioners and researchers that may reduce the research-pedagogy divide in the applied linguistics community.

Theoretical Framework

Community of practice has been a common framework used to explore English language teaching educators' professional learning and development (PLD) (e.g., Abbott & Lee, 2022), including those with a focus on X/Twitter as a tool for PLD (e.g., Rosell-Aguilar, 2018; Slagoski, 2019). Communities of practice emerge when "groups of people who share a concern or a passion for something they do and learn how to do it better as they interact regularly" (Wenger-Trayner & Wenger-Trayner, 2015, p. 2). As summarized by Hanson-Smith (2016), online communities of practice are characterized by a shared domain (e.g., language education), collaborative praxis (e.g., building and sharing domain-related knowledge and practice), ongoing social support (e.g., peer mentoring), and tools for collaborating at a distance (e.g., Zoom, LinkedIn, Facebook, X/Twitter).

Social Media and Education

In the context of language education, "social media usually refers to any application or technology through which users participate in, create, and share media resources and practices with other users by means of digital networking" (Reinhardt, 2019, p. 3). Social media platforms (e.g., Facebook, Instagram, LinkedIn, Reddit, Snapchat, TikTok, X/Twitter, YouTube) are powerful tools for communicating current information and facilitating interactions among online users for different purposes, including maintaining personal relationships, professional networking, media sharing, and learning. Social media tools allow users to share information individually and co-construct ideas collaboratively, making them useful tools for learning through the sharing and creation of content that may combine images, text, audio, and/or video. Teachers interested in PLD might participate in and form communities on social media platforms such as Reddit (e.g., Bret Staudt Willet & Carpenter, 2020), Instagram (e.g., Richter et al., 2022), TikTok (e.g., Hartung et al., 2023), WeChat (e.g., Xue et al., 2021) and X/Twitter (e.g., Carpenter & Krupka, 2015).

X/Twitter and Hashtags

Social media platforms such as X/Twitter can build communities of practice (e.g., Davis, 2015; Lord & Lomicka, 2014) by attracting users to affinity spaces (e.g., Carpenter & Krutka, 2014, 2015; Rosenberg et al., 2016) "where people affiliate with others based primarily on shared activities, interests, and goals" (Gee, 2004, p. 67). Affinity spaces on X/Twitter and other social media platforms, like

Facebook, Instagram, LinkedIn, and TikTok, are demarcated by hashtags that are optional in the short messages posted on X/Twitter which are called posts/tweets. Hashtags begin with the # symbol and are followed by a keyword(s), short phrase, or acronym (without any spaces between the # and the words, phrase, or acronym). Some hashtags may be commonly used acronyms and understood by members of a professional community but may be somewhat cryptic for non-members (e.g., #ELT represents English language teaching when it is used by professionals in the English language teaching community). Since 2017, posts/tweets can contain up to 280 characters of text and other content including links, photos, and/or videos. Some posts/tweets may also contain the @ symbol followed by a username (@username) as a way to mention or communicate with a particular user. Posts/tweets are posted under a user's profile and users can control whether their posts/tweets are viewable publicly or only by their followers. The use of hashtags can connect X/Twitter users to communities of practice (Wesely, 2013) in which community members explore specific topics and develop collaborative knowledge and best practices surrounding those topics (Wenger et al., 2002). Because hashtags serve as a mechanism for categorizing content and forming and identifying communities across a variety of social media platforms (Potnis & Tahamtan, 2021), the same hashtags used by X/Twitter users can be used to connect with community members on other platforms (e.g., Facebook, Instagram, LinkedIn, Snapchat, TikTok, YouTube).

Although Elon Musk bought Twitter in April 2022 and rebranded the platform as X that July, the functions described above remain and are still accessible for free. Due to the controversial nature of Musk's policies regarding the need for freedom of expression on the platform (Valero, 2023), there was speculation that some academics would refrain from posting on X (e.g., Kupferschmidt, 2022) and that this would have a negative impact on Twitter's existing communities of practice. However, a survey of scientists' use of X revealed that only 6.7% of approximately 9,200 respondents had stopped using the platform (Valero, 2023). As of March 2024, the platform still had 250 million daily users (Syed, 2024), indicating that the impact was not as drastic as anticipated. Members of the academic community have emphasized the importance of continuing to engage on X "to prevent the rise of false narratives and misinformation" (Lordan & Devkota, 2023, p. 6) and those who continue to post on X do so to "post sensible scientific tweets" (Stokel-Walker, 2023, p. 21).

Affordances of X/Twitter for Scholarly Communication and Professional Learning

Evidence of formal and informal scholarly communication via X/Twitter exists across different academic disciplines (Holmberg & Thelwall, 2014). Studies of X/Twitter conducted in fields such as health sciences have reported some novel findings not found in X/Twitter-based research in TESOL. For example, X/Twitter has been used as a practical professional tool for recruiting participants for research studies and for delivering interventions (Sinnenberg et al., 2017). Hawkins et al. (2014) noted that X/Twitter was helpful for connecting specialists with the public and for increasing the readership of peer-reviewed articles discussed in the posts/tweets. Zheng et al. (2022) indicated that X/Twitter allowed health educators to engage in effective weekly online synchronous professional development using the hashtag #MedEdChat. X/Twitter has also been used by educational researchers to examine backchanneling by conference attendees (Greenhow et al., 2019; Lemay et al., 2019); to disseminate surveys (Visser et al., 2014); to build digital identities (Li & Greenhow, 2015); to share professionally-relevant ideas, information, resources, media, and professional events (Veletsianos, 2012; Veletsianos &

Kimmons, 2016); to publicize university activities and events (Knight & Kaye, 2016); to seek answers to education-related questions (Holmberg & Thelwall, 2014); and to engage in self-directed PLD (Carpenter et al., 2020).

In the field of applied linguistics, X/Twitter research has predominantly focused on language learners' use of X/Twitter (see review in Hattem & Lomicka, 2016; Lomicka, 2017). More recently, researchers have devoted greater attention to language teacher PLD via X/Twitter. Findings suggest that X/Twitter can promote virtual communities of practice in a university course (Lord & Lomicka, 2014) or among teachers of second and foreign languages (Bartosik, 2022; Lupasco, 2017; Nicholas et al., 2018; Rosell-Aguilar, 2018; Slagoski, 2019; Wesely, 2013).

In these online communities, the use of specific hashtags can connect language teachers and facilitate their communication on X/Twitter. Rosell-Aguilar's (2018) examination of #MFLtwitterati revealed that a majority of participants who used this hashtag identified themselves as primary or secondary school language teachers working in the United Kingdom. These teachers reported using teaching practices and ideas shared by other #MFLtwitterati members. In a study of hashtag chats on #langchat or #edchat, Wesely (2013) found that the use of these X/Twitter hashtags promoted self-directed professional learning by connecting K-12 foreign language teachers throughout the world. Other studies that focused specifically on the context of English language teaching (ELT) have shown similar results. Lupasco (2017) interviewed four Canadian ELT practitioners to explore their experiences of learning and networking through #LINCchat. Findings from this master's thesis showed that participation in the #LINCchat community fostered professional learning and networking. Four teachers, documented in Nicholas et al. (2018), provided anecdotal evidence of the value of X/Twitter to support TESOL professionals via both synchronous and asynchronous chats using #CdnELTchat (formerly #LINCchat). They viewed self-directed PLD on X/Twitter as an effective alternative to traditional forms of PLD such as attending conferences. Findings from Bartosik's (2022) doctoral dissertation provided additional evidence that hashtags such as #CdnELTchat are "channels for sharing information" (p. 118) among language teachers in virtual communities. Slagoski (2019) compared the advantages of an online ELT professional learning network with those of more traditional forms of professional learning. Key advantages of professional learning via social media such as X/Twitter included greater accessibility, lower cost, and succinctness of information shared. In a review of the use of technology in English language teaching, Hockly (2017) noted that X/Twitter can provide teachers "with the opportunity to interact with researchers and academics, and to keep up to date with their research interests and work" (p. 371).

Barriers to X/Twitter Use Among Academics

In addition to the affordances of X/Twitter for fostering scholarly communication and PLD, barriers to the use of X/Twitter by academics have been reported (Donelan, 2016). As part of a larger study of social media use by academics, Donelan conducted a thematic analysis of academics' comments about X/Twitter to identify the main reasons for their lack of use for work-related purposes. The main themes associated with barriers to academics' use of X/Twitter were reported as having no interest, negative perceptions, a lack of skills, a lack of time, and safety concerns.

Research Questions

Given the potential of X/Twitter for bridging the research-practice gap in L2 education (Sato & Loewen, 2022; Spada & Lightbown, 2022), the purpose of this study was to compare the professional uses of X/Twitter by TESOL researchers and practitioners (i.e., teachers and those in related "professions and roles, such as policy makers, program directors, textbook writers, educational bloggers, and media content producers" [Sato & Loewen, 2022, p. 511]) in order to better understand the role of X/Twitter in connecting and supporting TESOL PLD and research. The following research questions (RQ) were addressed:

RQ1: What hashtags are most directly related to TESOL for adult learners in Canada?

RQ2: What are the uses of X/Twitter by TESOL community members who use the directly related hashtags in their posts/tweets?

RQ3: What are the uses of X/Twitter by TESOL professors employed in North American universities?

RQ4: To what extent do TESOL professors use the TESOL-related hashtags in their posts/tweets?

This exploration allowed us to determine if X/Twitter was being used to connect these two groups and support the members' PLD.

Method

The study was conducted in three stages. In stage 1, hashtags most directly related to TESOL for adult learners in Canada were identified. Stage 2 focused on the uses of X/Twitter by TESOL community members who used the directly related hashtags. Researchers' use of X/Twitter was examined in Stage 3. This study followed research ethics policies established by the Government of Canada (2022) in their *Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans* and by the University of Alberta's research ethics board. Because this study "uses exclusively information in the public domain that may contain identifiable information, and for which there is no reasonable expectation of privacy" (Government of Canada, 2022, p. 17), it did not require ethics approval. Furthermore, according to the University of Alberta Research Ethics Office (2020), "non-intrusive research relying exclusively on publicly available information is exempted from REB review... . An example might involve information posted publicly online via Twitter" (Para 2). X/Twitter users agree to the platform's privacy policy: "Twitter is public and tweets are immediately viewable and searchable by anyone... . You can also use Twitter under a pseudonym if you prefer not to use your name" (Twitter, 2020, Para 1). To protect the anonymity of the X/Twitter users whose posts/tweets were included in our data set, all personal identifiers were excluded.

Data Collection and Analysis

Stage 1

To collect a sample of posts/tweets relevant to TESOL for adult learners, first hashtags from TESOL-related articles were identified and a search conducted for TESOL-related hashtags on Google. Then the hashtags were used as search parameters to gather an initial 500 posts/tweets from Twitter. Next, the 500 posts/tweets were examined to identify additional TESOL-related hashtags. The hashtags were categorized into two lists: 23 hashtags that all four members of the research team agreed were the most directly related to TESOL for adult learners in Canada and 46 that were indirectly related to TESOL for adults. Hashtags were deemed as directly related if the majority of the posts/tweets contained information that instructors of adult ESL learners in Canada would likely find relevant for their PLD; whereas the majority of the posts/tweets with indirectly related hashtags were not deemed relevant. For example, #pronunciation was classified as an indirectly related hashtag because posts/tweets with this hashtag were related to the pronunciation of many different languages. Directly related hashtags included #AUSELT; #BBClearnEnglish; #BCTEAL; #CATESOL; #CdnELTchat; #CLIL; #CoTESOL; #EAL; #EALchat; #ELL; #ELLchat; #ELLs; #ELT; #ELTChat; #ELTdiscussion; #ESL; #ESOL; #LINCchat; #TESOL; #TESL; #TESLCanada; #tleap; #PBLA. Professional acronyms included in these hashtags are as follows: Australian English language teaching (#AUSELT); British Broadcasting Corporation learn English (#BBClearnEnglish); British Columbia Teachers of English as an Additional Language (#BCTEAL); California Teachers of English to Speakers of Other Languages (#CATESOL); Canadian English language teachers chat (#CdnELTchat); content and language integrated learning (#CLIL); Colorado Teachers of English to Speakers of Other Languages (#CoTESOL); English as an additional language (#EAL); English as an additional language chat (#EALchat); English language learning (#ELL); English language learning chat (#ELLchat); English language learners (#ELLs); English language teaching (#ELT); English language teaching chat (#ELTChat); English language teaching discussion (#ELTdiscussion); English as a second language (#ESL); English for speakers of other languages (#ESOL); Language Instruction for Newcomers to Canada chat (#LINCchat); teaching English to speakers of other language (#TESOL); teaching English as a second language (#TESL); teaching English as a second language in Canada (#TESLCanada); Teaching and Learning in English for Academic Purposes (#tleap); portfolio-based language assessment (#PBLA).

Stage 2

The related hashtags were entered as search parameters into a free software program called Twitter Archiving Google Sheet (TAGS; Hawksey, 2020, V6.1.9.1) to create our TESOL-related hashtag tweet data set (n = 4,833) of posts/tweets posted between October 2020 and January 2021, which is when we collected the data. TAGS has been used by other researchers (e.g., Awan et al., 2023; Greenhalgh & Koehler, 2017; Park et al., 2018; Qian et al., 2020) to access Twitter's application programming interface (API) to retrieve posts/tweets and is then used to parse the data from the API into a spreadsheet format (i.e., a Google Sheet). Prior to February 2023, Twitter provided researchers with free access to Twitter's API; however, X now charges a minimum of $100 USD per month to access its

API. Although X/Twitter as a conference backchannel can enrich the dissemination of research because we were interested in PLD beyond the social networking and PLD that is fostered by conferences, we decided to exclude the 1,336 posts/tweets that emanated from conference attendance. A content analysis of the remaining 3,497 posts/tweets in the hashtag tweet data set was conducted to infer how and why TESOL community members used X/Twitter in the affinity spaces marked by the 23 directly related hashtags identified in Stage 1. According to Krippendorf (2019), content analysis can be used to make "valid inferences from texts (or other meaningful matter) to the contexts of their use" (p. 24). In the current study, individual posts/tweets (i.e., texts) served as the unit of analysis that our inferences regarding the uses of X/Twitter were based upon.

In the first stage of the analysis, two members of the research team independently open-coded one third of the posts/tweets to develop categories that captured the communicative purpose of the posts/tweets. The researchers met to discuss their coding and reach a consensus on the coding categories. At the end of this first stage of coding, three categories and eight subcategories were established (Table 1). In the second stage of coding, two members of the research team used the established coding categories to independently code the entire dataset. Interrater agreement was 94%. A team meeting was held to discuss the discrepancies and reach consensus.

All user accounts associated with the posts/tweets were examined in an attempt to isolate a subset of posts/tweets posted by North American TESOL professors; however, posts/tweets from this group of users in our dataset were not found. Therefore, to compare the TESOL community members' uses of X/Twitter identified in the hashtag data set with the uses of X/Twitter by North American TESOL professors, an additional data set of professors' posts/tweets were extracted (described in stage three).

Stage 3

We purposively sampled 82 tenure-track and tenured professors who held faculty positions at North American universities, had published in the field of TESOL, and had presented at the 2021 American Association for Applied Linguists Conference. To determine whether these researchers held public X/Twitter accounts, we searched for them on X/Twitter using their full names and searched their university profile webpages for links to their X/Twitter accounts in the event that they did not use their full name in their X/Twitter profile. We collected all their posts/tweets between April 2020 and April 2021 (n = 272) and then searched for these professors' usernames in the data collected in Stage 2 because they may have used a different X/Twitter name. This search ensured that the posts/tweets were not duplicated across the two data sets. A content analysis of the professors' posts/tweets was then conducted to infer their uses of X/Twitter. We also examined the professor dataset to identify the hashtags they used and to determine whether they used any of the same hashtags that appeared in our data set gathered in Stage 2. This analysis allowed us to infer whether any public dialogue occurred between the two groups.

Results

Uses of X/Twitter by TESOL Community Members Who Used One or More of the 23 Directly Related Hashtags

Table 1 shows the uses of TESOL community members' posts/tweets in data collected in Stage 2. Approximately half of the posts/tweets were posted to share or publicize materials that were developed for students to use independently or that teachers could incorporate into their lessons. Of the posts/tweets, 28% were used to promote or comment on professional development opportunities, including sharing information about conferences and webinars, promoting synchronous X/Twitter meetings, and sharing publications. The remaining 22% of the posts/tweets involved practitioners sharing their own or their learners' experiences, commenting on issues related to their employment such as wages, and acknowledging colleagues' achievements.

Table 1

TESOL Community Members' Uses of X/Twitter

Category and sub-categories	*f*	%	Total %
Sharing learning and teaching materials			50.50
Sharing self-explanatory materials learners could use (e.g., acronyms, word lists, quizzes, word definitions, videos)	1,641	46.93	
Sharing free materials that could be used by practitioners with adaptations (e.g., lesson plans, teaching tips, resources)	125	3.57	
Promoting professional learning and development			27.94
Promoting articles and books	316	9.04	
Advertising resources for sale	305	8.72	
Promoting webinars, panel discussions, conferences	276	7.89	
Promoting programs for ESL-related certificates/degrees	80	2.29	
Sharing experiences and networking			21.56
Sharing practitioners' professional experiences (not teaching materials)	572	16.36	
Commenting on employment-related issues (wages, contracts, discrimination)	102	2.92	

Category and sub-categories	*f*	%	Total %
Total	3,497	100.00	100.00

Professors' Uses of X/Twitter

Of the 82 North American TESOL researchers searched for on X/Twitter and in the Stage 2 data, 15 had public X/Twitter accounts, 11 were active on X/Twitter between April 2020 and April 2021, and none were represented in the Stage 2 data (i.e., the TESOL-related hashtag data set). Researchers were considered active if they made at least one post/tweet. Throughout the year, the 11 researchers posted a total of 272 posts/tweets. Approximately 65% of their posts/tweets were posted to promote research knowledge mobilization, 33% were used to share professional experiences and to network with others, and the remaining were used to share teaching and learning resources (Table 2).

Table 2

TESOL Professors' Uses of X/Twitter

Categories and sub-categories	*f*	%	Total %
Promoting research knowledge mobilization			64.71
Promoting webinars, panel discussions, conferences	94	34.56	
Promoting academic articles and books	73	26.83	
Promoting university programs	5	1.84	
Promoting research participation	4	1.47	
Sharing experiences and networking			32.72
Sharing researchers' professional experiences (not teaching materials)	68	25.00	
Acknowledging colleagues' achievements/awards	18	6.62	
Commenting on employment-related issues (wages, contracts, discrimination)	3	1.10	
Sharing learning and teaching materials			2.57
Sharing resources for learners	7	2.57	
Total	272	100.00	100.00

Hashtag Use

Professors in the sample used 47 different hashtags in 54 of the 272 posts/tweets in Stage 3 data; therefore, they only used hashtags in 20% of their posts/tweets. We also compared the hashtags used by the professors with those in the hashtag data set and found that none of the professors used any of the same hashtags. The hashtags used by the professors were related to research conferences (e.g., #AAAL2021), specific research topics (e.g., #corpuslinguistics), and teaching and advising students at university (e.g., #phdadvising).

Discussion

This study examined the professional uses of X/Twitter by members of the TESOL community to explore the potential of X/Twitter for sharing resources, research, PLD, networking, and building community. Although both researchers and practitioners are members of the broader TESOL community, the lack of overlap between the professor and TESOL community member data in our study supports our use of the researcher-practitioner dichotomy when examining their communication on X/Twitter, which has the potential to contribute to knowledge sharing across the two communities. In general, TESOL practitioners and the North American university professors captured in our data used X/Twitter for similar purposes, but the frequency to which they engaged in these uses was different across the two groups. There were some unique uses in each of the groups. Practitioners mainly used X/Twitter for sharing resources whereas researchers predominantly used it for research knowledge mobilization. Given that research knowledge mobilization is an expectation of tenure-track and tenured professors that is not typically expected of practitioners, this finding is not surprising, as career progression, which is connected to the extent of a researcher's knowledge mobilization, appears to influence the uptake of X/Twitter by academics (Donelan, 2016). Job responsibilities clearly contribute to the differential uses of X/Twitter between researchers and practitioners.

Finding that the majority of the practitioners' posts/tweets involved sharing of learning and teaching resources supports the results from studies of educators' self-reported uses of X/Twitter. For example, Carpenter and Krutka's (2014) survey results indicated that resource sharing was the most popular use reported by K-12 teachers and teacher educators. The participants in their study also indicated that access to resources and ideas on X/Twitter enhanced their abilities to network with others and this networking facilitated their professional development. Consistent with Nicholas and colleagues' (2018) reported use of X/Twitter as a platform to connect with TESOL professionals and promote self-directed professional learning, the professional uses of X/Twitter by practitioners in our data confirmed the value of X/Twitter for professional development and networking with others.

Respecting researchers' uses of X/Twitter, other studies conducted in the fields of K-12 education and health sciences have reported the effectiveness of X/Twitter as a research tool. For instance, X/Twitter has facilitated survey dissemination (Visser et al., 2014), research participant recruitment (Sinnenberg et al., 2017; Visser et al., 2014), and the delivery of health interventions (Sinnenberg et al., 2017). However, we only found one instance of research facilitation for the purpose of participant recruitment in our researcher data, which was retweeted three times. The purpose of

almost two-thirds of the researchers' posts/tweets was to promote research knowledge mobilization events such as research conferences and webinars, and to disseminate academic readings. In a similar study of 42 college and university professors' posts/tweets, Veletsianos (2012) reported that *sharing information, media and resources* was the most frequent purpose (39%). Veletsianos and Kimmons (2016) also suggested that "many scholars use Twitter to share their work with a broader audience" (p. 9).

Given the potential of X/Twitter for bridging the research-practice gap in TESOL, only 11 of the 82 professors in our study posted posts/tweets over a 12-month period. Because the professors posted less frequently (approximately 13 times) than the practitioners, the disparity in usage between the two groups is a factor that limits the interactions between the two groups rather than bridging the research-practice gap. It is speculated that the lack of professional uses of X/Twitter by the professors is related to the barriers identified by Donelan (2016), such as a lack of interest/time. Furthermore, given that none of the researchers in our study used the same hashtags as the broader TESOL practitioner community, the researchers' posts/tweets may not be reaching as broad an audience as they could. It is possible that influential researchers in TESOL may rely on their followers to distribute their posts/tweets on X/Twitter and beyond, but the addition of hashtags could optimize the reach of their research, particularly to newcomers to the field of TESOL who are unfamiliar with the researchers' work. Although education-related hashtags have the potential to support communities of practice by facilitating the creation of "affinity spaces for interactions" (Carpenter et al., 2020, p. 18), the lack of commonly used hashtags among TESOL researchers and practitioners suggests that these two groups are relatively separate communities on X/Twitter.

The following suggestions for ways in which practitioners and researchers could be more strategic in their use of X/Twitter and hashtags may help users to locate affinity spaces and bridge the gap between these two communities.

- When searching X/Twitter for information on specific PLD topics, include hashtags in the search terms (e.g., *#pronunciation* instead of *pronunciation*) to increase the probability of finding relevant affinity spaces.
- Combine directly-related TESOL hashtags with other keywords in X/Twitter searches (e.g., *#TESL AND #pronunciation* or *#TESL AND pronunciation*) to increase the likelihood of locating TESOL-related affinity spaces.
- Note the other hashtags used in TESOL-related posts/tweets to locate additional affinity spaces of interest (e.g., *#RefugeesWelcome, #ChatGPT*).
- Follow specific users' accounts (e.g., researchers' accounts) to reap the full potential of X/Twitter as a PLD resource. Because users do not always add hashtags to their posts/tweets, these posts/tweets exist outside of affinity spaces marked by hashtags.
- Always tag posts/tweets with hashtags to increase the likelihood of their discovery by the broader/targeted community (e.g., add the # symbol in front of keywords that represent shared affinity spaces such as #TESL).

- Agree upon and consistently use the same hashtags when posting/tweeting to cement affinity spaces that support interactions among TESOL practitioners and researchers and to build communities of practice. For example, professional associations and conference organizers could promote and encourage the use of specific hashtags.

In our study, we established that hashtags were not being used to their full potential by the users to connect and interact with one another in shared TESOL affinity spaces. Therefore, these suggestions might promote a more principled approach to using hashtags for connecting the practitioner and researcher X/Twitter communities. Our recommendations for hashtag use may also be applied to other popular social media platforms (e.g., Facebook, Instagram, LinkedIn, Snapchat, TikTok, YouTube) in which hashtags may be used to categorize content and identify communities.

Limitations and Future Research

A number of methodological limitations exist in this study. By using publicly accessible posts/tweets to infer how and why TESOL community members use X/Twitter, the focus narrowed to members who actively tweet. It is likely that some members read but do not post (i.e., lurk), which may be considered a form of legitimate peripheral participation within a community of practice. We also focused on North American professors and may have missed some of their X/Twitter accounts if they did not use their full names in their profiles or include their X/Twitter names on their university webpages. Similar to other studies of social media platforms, we captured snapshots of posts/tweets within a specific timeframe and this impacted our ability to examine X/Twitter hashtags as fluid networks of people and technology that change over time (e.g., new hashtags can be created while old ones are retired/abandoned) and are also impacted by the shifting landscape of English language teaching (e.g., championing social justice).

Avenues for future research include an analysis of a wider sample of posts/tweets by TESOL researchers worldwide, the impact of researchers' posts/tweets on practitioner PLD, the contributions of single hashtags such as #ELTchat to TESOL practitioners' PLD, and the processes of practitioner knowledge co-construction via X/Twitter and other social media platforms. Other research methods, such as social network analysis, may also offer novel insights into TESOL X/Twitter hashtag networks. In addition to examining hashtags on an individual basis, a mixed-methods approach involving the use of interviews and/or social network analysis could be conducted to examine how hashtag networks are linked to one another, the power dynamics that influence participation by members of the networks, and who acts as a bridge between these networks. Because TESOL researchers and practitioners might also be posting or sharing ideas on other social media platforms, analyses of their use across the platforms may provide additional insights regarding the potential of these tools for strengthening the research-practice link.

Conclusion

Social media platforms are prominent sources of information for educator PLD (e.g., Bret Staudt Willet, 2024), including those in TESOL contexts (Abbott et al., 2017). Previous work on the use of X/Twitter in L2 learning has outlined how X/Twitter can be used to support learning and foster communities of practice that interact in social networks; however, there has been a lack of research examining TESOL professors' and practitioners' professional uses of X/Twitter. This gap was addressed by collecting TESOL-related posts/tweets through both hashtag-based and username search strategies to form two tweet data sets for analysis. Findings indicate that practitioners predominately use X/Twitter for instructional resource sharing whereas professors mainly use it for research knowledge mobilization. However, the extent of professors' research knowledge mobilization via X/Twitter, may be limited due to their absence of engagement with practitioners in shared hashtag-demarcated affinity spaces where the research-practice divide could be bridged. This study suggests that it is possible to extend the professional uses of X/Twitter in the field of TESOL and better connect TESOL researchers and practitioners. By implementing our recommendations for strategic X/Twitter and hashtag use, professors may expand their social and personal learning networks, engage with current professional issues in the field, share their work with a wider audience, and potentially foster additional PLD.

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Learners' Perceptions of Synchronous Written Corrective Feedback in Videoconferenced Collaborative Writing

Perceptions des apprenants de la rétroaction corrective écrite synchrone dans la rédaction collaborative par vidéoconférence

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Abstract

Second language (L2) research suggests that synchronous written corrective feedback (SWCF) in online collaborative writing tasks can help improve L2 linguistic knowledge and writing skills. Following the rise of online collaborative writing in the wake of the COVID-19 pandemic, this exploratory study examines L2 learners' perceptions of receiving SWCF during collaborative writing tasks completed on an online text-editing platform (Google Docs) and mediated by videoconferencing (Zoom). Adult learners ($N = 46$) enrolled in advanced online French as a Second Language courses took part in two collaborative writing tasks, during which their teachers ($N = 3$) provided SWCF. Learners' screen activity was recorded. After the experiment, a perception survey was distributed and selected participants took part in semi-structured interviews to further discuss their experience. Results indicate that learners viewed the provision of SWCF through computer-mediated communication as an effective way to improve their L2 writing compared to traditional, delayed written feedback. Pedagogical implications for the implementation of videoconferenced collaborative writing tasks involving teacher SWCF are discussed.

Keywords: computer-assisted language learning; computer-mediated communication; synchronous written corrective feedback; videoconferenced collaborative writing

Résumé

La recherche en langues secondes (L2) suggère que la rétroaction corrective écrite synchrone (RCÉS) dans les tâches d'écriture collaborative (ÉC) en ligne peut aider à améliorer les compétences en écriture. Au vu de l'essor de l'ÉC en ligne faisant suite à la pandémie de COVID-19, cette étude exploratoire examine les perceptions des apprenants de L2 quant à la RCÉS reçue lors de tâches d'ÉC

effectuées sur une plateforme d'édition de texte en ligne (*Google Docs*) et médiatisées par vidéoconférence (*Zoom*). Les apprenants adultes avancés de français L2 ($N = 46$) ont participé à deux tâches d'ÉC, au cours desquelles leur enseignant ($N = 3$) fournissait une RCÉS. L'activité d'écran des apprenants a été enregistrée. Après l'expérience, un questionnaire de perceptions a été distribué et les participants sélectionnés ont participé à des entretiens semi-structurés pour discuter de leur expérience. Les résultats indiquent que les apprenants considèrent la RCÉS médiatisée par la technologie comme un moyen efficace d'améliorer leur écriture en L2 par rapport à la rétroaction écrite traditionnelle et différée. Les implications pédagogiques pour la mise en œuvre de tâches d'ÉC par vidéoconférence sont discutées.

Mots-clés : apprentissage des langues assisté par ordinateur ; communication assistée par ordinateur ; rétroaction corrective écrite synchrone ; rédaction collaborative par vidéoconférence

Introduction

Second language (L2) teachers traditionally use delayed corrective feedback to aid learners in understanding and rectifying errors. One limitation of this practice, which is time-consuming for the instructor (Kim, Choi, Kang, et al., 2020), is that learners do not always recall their initial communicative intention when they receive feedback, as it is usually delayed by a few days (Liu & Brown, 2015). Synchronous corrective written feedback (SCWF) offers a feasible alternative through platforms like Google Docs (Zhang & Zou, 2022). Such tools, used for computer-mediated collaborative writing (CW), enable novel teaching practices by providing SCWF to learner groups and tracking its uptake (Bikowski & Vithanage, 2016).

The use of videoconferencing software (e.g., Zoom) for synchronous language learning has surged (Kohnke & Moorhouse, 2020). Recent studies highlight the potential of videoconferenced CW tasks, boosting learner engagement more than chat-based CW (Aubrey, 2022). Furthermore, videoconferenced CW, which triggers oral interaction between learners, prompts quick conversational repairs, aiding dynamic text enhancement (Balaman, 2021). Given limited research on learner views of synchronous computer-mediated communication in L2 classrooms, this study investigates the affordances and challenges of SWCF in videoconferenced CW from the learners' perspective.

Theoretical Framework and Literature Review

Collaborative Writing and Synchronous Written Corrective Feedback

Collaborative writing, defined as "an activity where there is a shared and negotiated decision-making process and a shared responsibility for the production of a single text" (Storch, 2013, p. 3), involves learners in the co-authorship of written texts. From a cognitive (Long, 2017) and sociocultural perspective (Storch, 2017), CW can support language acquisition, as the co-writing of a single text provides learners with opportunities to negotiate both meaning and form (Long, 2017). Collaborative text revision leads to *languaging* – the "process of making meaning and shaping knowledge and

experience through language" (Swain, 2006, p. 98) – and exposes learners to a variety of new words, thus reinforcing grammatical accuracy while improving their discursive competence (Abrams, 2019). In addition to co-constructing linguistic knowledge, language learners can benefit from their peers' writing skills (Swain & Lapkin, 2001).

Second language researchers have explored the potential of Web 2.0 tools for both asynchronous (e.g., wikis, forums, blogs) or synchronous (e.g., Google Docs) computer-mediated CW (Li, 2018). Wu (2015) found that synchronous chat-based computer-mediated CW was less intimidating than face-to-face CW. In one of the rare comparative studies involving voice-based interaction, Oskoz and Elola (2014) found that learners focused more on general text structure during synchronous voice interaction, while they tended to focus on localized grammatical and lexical issues (e.g., word choice) during asynchronous text-based computer-mediated CW. Although videoconferencing has the potential to support L2 learning by facilitating meaning negotiation during computer-mediated CW tasks (Balaman, 2021), its use remains under investigated in L2 research (Storch, 2019).

From a cognitive and sociocultural perspective, the provision of written corrective feedback, which consists of L2 learner text corrections, supports learner linguistic knowledge and accuracy by bringing their attention to linguistic form (Kim, Choi, Kang, et al., 2020; Shintani & Aubrey, 2016). Recently, researchers explored the potential of using online text-editing platforms (e.g., Google Docs) to provide computer-mediated SWCF, with conclusions showing that providing SWCF during synchronous computer-mediated CW helps to improve grammatical accuracy (Shintani & Aubrey, 2016; Yamashita, 2021). Yeh (2014) found that synchronous text-chat collaboration during computer-mediated CW led to better writing products, as participants could receive immediate peer feedback and clarify linguistic elements. However, SWCF during CW tasks remains under-researched (Kim, Choi, Yun, et al., 2020), and according to Cho et al. (2022), "it would be insightful to capture students' perceptions by employing different methods (e.g., interviews, questionnaires, stimulated recall)" (p. 16).

Learners' Perceptions of Computer-Mediated Collaborative Writing

Little is known about student perceptions of synchronous computer-mediated CW, with research focusing primarily on English as a foreign language (EFL), often with limited sample sizes (Nguyen, 2023). Bikowski and Vithangage (2016) compared individual versus collaborative writing (Google Docs) in an intermediate EFL university course. They found that 42 (71%) out of of 59 participants felt that computer-mediated CW helped them improve their writing skills (speed and organization) in a low-anxiety and engaging environment. They enjoyed collaboratively proofreading and revising their texts as "great discussions and teamwork" took place (p. 88). Similarly, Strobl (2014) showed that synchronous CW in Google Docs led to better content selection and text organization than individual online writing among advanced adult learners of German after three weeks. In Ubaldo (2021), the majority of 31 intermediate EFL learners preferred to work in pairs or in groups of four (rather than six), as this was perceived as an efficient way to mutualize linguistic resources and writing skills. Last, Zhang and Zou (2022) found a positive correlation between student perceptions of computer-mediated CW, engagement in group discussion, and the number of collaboratively resolved errors.

Computer-mediated CW also presents some challenges. For instance, Alghasab and Handley (2017) observed non-collaborative writing patterns and unequal participation among intermediate-level adolescent EFL learners in Kuwait. Lack of equal participation can make it difficult to merge opinions and can create frustration among the CW groups (Bikowski & Vithangage, 2016; Ebadi & Rahimi, 2017). In a case study involving two argumentative computer-mediated CW tasks, Cho (2017) found that learners ($N = 3$) may also distrust their peers' advice (according to stimulated recall interviews). Finally, time management (e.g., time allotted to the planning phase) can prove challenging to some groups of learners (Alharbi, 2020).

Despite the increasing use of videoconferencing tools like Zoom, to our knowledge no study has yet investigated learners' perceptions of videoconferenced CW. Only Balaman (2021) explored interactional practices in videoconferenced CW (Google Docs and Skype) in a study that focused on the co-construction of a single sentence by two EFL learners during a single CW task.

Student Perceptions of Synchronous Written Corrective Feedback

Kim, Choi, Kang, et al. (2020) argue that "when examining SWCF, learners' perceptions of such feedback methods cannot be ignored" (p. 182), as SWCF may influence a student's writing processes through different factors (e.g., distraction or anxiety).

Aubrey (2014) was the first to investigate SWCF during synchronous computer-mediated CW. In his study, 44 Japanese adult learners from two intact intermediate EFL classes declared in a post-experimental survey that receiving SWCF during essay writing on Google Docs was motivating and useful. In a case study, Shintani (2016) also accessed two intermediate EFL learners' perceptions of synchronous versus asynchronous computer-mediated written corrective feedback through stimulated recall interviews. While SWCF helped learners avoid repeating the same errors, learners considered it distracting as the feedback occurred at the time of writing. This contrasts with Kim, Choi, Kang, et al.'s (2020) paper-based CW study, where beginner Korean university learners reported that SWCF didn't disrupt their writing flow.

Without using a comparative (synchronous versus asynchronous) approach, Alharbi (2020) investigated upper-intermediate EFL learners' perception of SWCF (Google Docs). Ten Saudi students aged 20 to 23 took part in weekly, 2-hour CW sessions over one semester. The teacher provided SWCF through margin comments. During individual interviews, learners commented that the teacher's SWCF combined with peer collaboration helped them to notice and address both global (text organization) and local (grammar) issues. Four participants expressed their preference for teacher rather than peer feedback, while six declared that teacher and peer feedback were complementary. Reported challenges included the difficulty to locate peer comments, as well as occasional technical issues. Similarly, but in a face-to-face setting, Kim, Choi, Yun, et al. (2020) investigated the perception of 54 beginner learners of Korean about two CW tasks involving indirect SWCF. Comments from a post-experimental survey questionnaire revealed that overall, these CW tasks were perceived as helpful (75% of the responses). However, confusion and potential stress emerged when learners did not understand SWCF and were unsure how to address errors. Confusion decreased during the second task (for which no comments

related to stress were found), suggesting that task repetition might help shape learners' positive perceptions of SWCF during CW tasks.

While learners' perceptions of SWCF have gained attention, recent studies (e.g., Cho et al., 2022; Kim, Choi, Kang, et al., 2020; Kim, Choi, Yun, et al., 2020) have taken place in face-to-face, paper-based CW settings and targeting adult learners of Korean. More research is needed to examine SWCF in other contexts (e.g., L2 learning settings) and formats (e.g., computer-mediated CW).

The Current Study

This literature review identifies several research gaps in the perceptions of SWCF and CW. First, the potential of SWCF during CW tasks should be further explored by "including the consideration of various task designs and implementation factors, as well as diverse instructional contexts" (Kim, Choi, Kang, et al., 2020, p. 197). This study targets a less investigated language (i.e., French) in the specific context of an online course. Second, although the advantages of synchronous computer-mediated CW have been increasingly supported by empirical research, the studies reviewed involved text or audio – but not video – interaction between learners. To our knowledge, no study has yet looked at learners' perceptions of SWCF provided during videoconferenced CW tasks. Understanding such perceptions has become crucial in the wake of the COVID-19 pandemic, as L2 teachers increasingly rely on text-editing software and videoconferencing.

To explore the affordances of limitations of SWCF provided during videoconferenced CW tasks from a learners' perspective, the following research questions were used:

1. What is the perceived learning value of receiving and addressing SWCF provided during videoconferenced CW, according to L2 learners?
2. What is the perceived feasibility of receiving and addressing SWCF provided during videoconferenced CW, according to L2 learners?

Methods

Instructional Context and Participants

Participants included 46 adult learners of French as a second language (FSL) recruited from advanced intermediate and advanced level classes in a Canadian university. The participants volunteered to complete two CW tasks on Google Docs as part of their online FSL course focusing on writing skills. Using intact classes aimed to foster intercultural understanding and L2 communication (Li, 2018). The participant group included 33 females and 13 males, with an average age of 20 years. The participants included 32 individuals: 18 of them had started learning FSL in Grades 6-9 in English-speaking Canadian provinces, while the other 14 were international students. On average, participants had 10.4 years of FSL learning experience. English was the most common first language (n = 34), followed by Arabic, Mandarin, and Korean, among others. Participants had similar FSL proficiency levels, according to their institutional placement tests. Their teachers, all native French speakers, had 5, 8, and 19 years'

FSL teaching experience, and each had taught a group of 12 to 22 students for 3 to 5 months at the time of the experiment.

Procedure and Instruments

Participants engaged in two 1-hour CW tasks, spaced three weeks apart, using Google Docs and Zoom (breakout rooms). These platforms were chosen because the participants were familiar with their use in an academic context, which helped to limit the novelty effect. Two opinion exchange tasks were completed as part of the course. Participants collaboratively wrote 400- to 500-word argumentative texts on topics related to COVID-19: Task 1 was about the pros and cons of mandatory vaccination, and Task 2 dealt with the pros and cons of curfews (Appendix).

Classes were divided into groups of 3 and 4 participants, adhering to Dobao's (2012) recommendation for effective participation. When this was not feasible, slight deviations in group size were allowed. Participants were free to choose their groups for Task 1 (15 small groups). Task 2 maintained the same groups, mirroring authentic classroom settings (Bikowski & Vithanage, 2016; Yamashita, 2021). Students began each task by accessing a Google Doc which contained instructions. Students were instructed to work together rather than to divide the writing. Learners interacted verbally in Zoom breakout rooms, either in French (the target language) or English (the lingua franca).

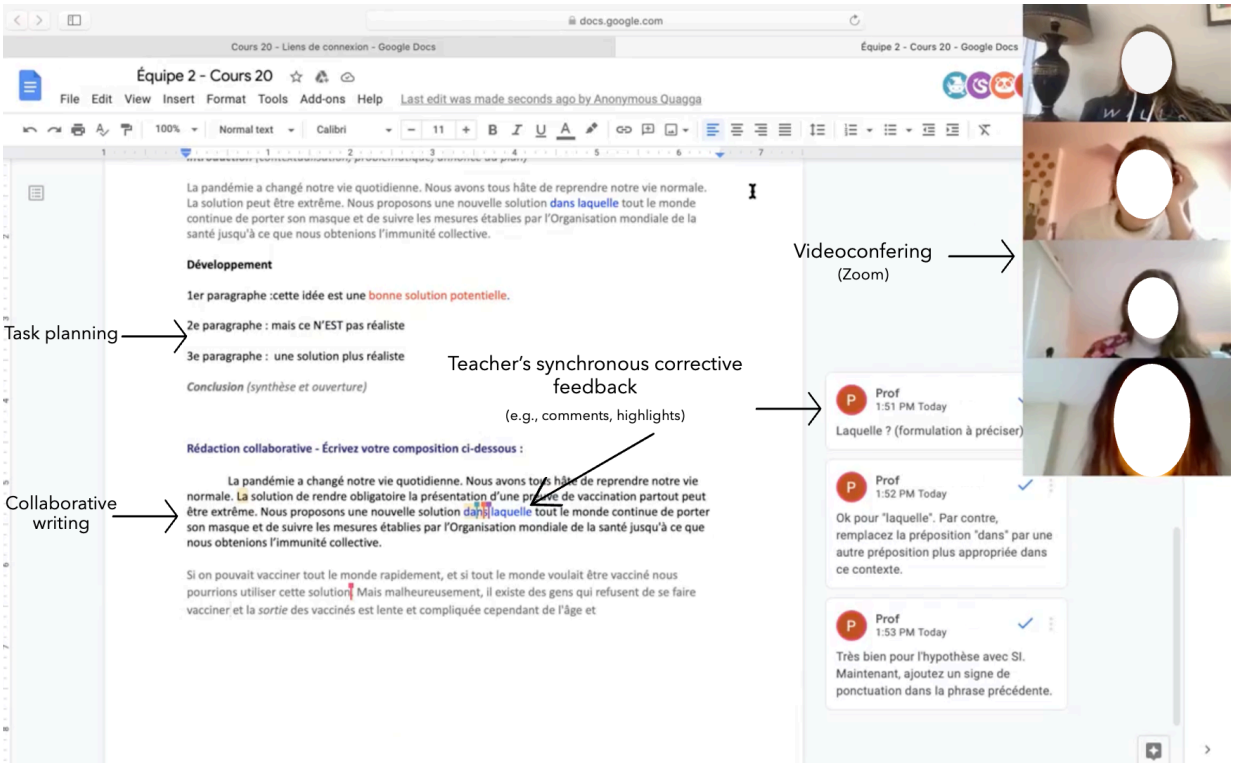
During CW tasks, teachers followed instructions to open each group's Google Docs in separate Internet tabs and provide SWCF. They navigated between 5–7 documents per task, depending on the class size. Synchronous written corrective feedback was provided after groups had written at least two sentences. Due to the study's exploratory nature, teachers had flexibility in the amount and format of the feedback. This included direct or indirect feedback through highlights or comments (e.g., inviting students to reflect on word choice, suggesting checking noun-adjective agreement). Each SWCF provision lasted 30 to 90 seconds before proceeding in a recurring cycle. Teachers did not visit breakout rooms to avoid creating confounding variables in regard to learners' perceptions. Figure 1 illustrates a typical learner's screen during a task.

After completing Task 2, students answered a post-experimental survey to reflect on their learning experience. The survey included a sociodemographic questionnaire and 13 Likert-scale questions. These questions assessed participants' agreement levels (ranging from 1 = *strongly disagree* to 5 = *strongly agree*) with statements related to SWCF and CW. The survey was adapted from Kim Choi, Yun et al.'s (2020) interview questions on SWCF perception during CW and from Bikowski & Vithanage's (2016) online CW perception survey. It was also informed by the technology acceptance model (Venkatesh & Davis, 2000), which posits that perceived usefulness (Statements 2, 4, 6, and 13, $\alpha = 0.79$) and perceived ease of use (Statements 7 and 8, $\alpha = 0.51$) influences users' experience with technology. Perceived enjoyment (Statements 1, 3, 10, and 11, $\alpha = 0.85$), along with Statements 5 (potential distraction during SWCF), 9 (prior CW experience), and 12 (willingness to repeat the experience), offered further insights into perceptions. The lower α for ease of use stemmed from the limited item count (Field, 2018). To bolster validity, two L2 researchers classified items under ease of use, usefulness, and enjoyment categories. The inter-rater reliability for ease-of-use statements reached

100%. The survey also featured an open-ended question for additional comments. Due to naturalistic conditions leading to absenteeism and attrition, the survey garnered 23 responses.

Figure 1

Learner's View During a CW Task (Google Docs) Mediated by Videoconferencing (Zoom)



Two weeks after Task 2 completion, 10 participants took part in stimulated recall interviews – a method of introspection that delves into learners' thought processes and strategies (Mackey et al., 2000). This approach aligns with Cho et al.'s (2022) suggestion of employing diverse qualitative methods to understand learners' perceptions of SWCF in a CW setting. Interviewees were selected from the pool of participants who, in their consent forms, had expressed interest in being contacted for an interview. Three to four students were chosen from each of the three intact participating classes to match the distribution of the sample's first language and years of experience learning French (sociodemographic survey data). To ensure similarity to the overall sample, students who had not completed both tasks were excluded from selection. The first language of interviewees was English (n = 6), Mandarin (n = 1), Turkish (n = 1), Korean (n = 1), and Arabic (n = 1). The mean age was 20.4 years and participants had an average of 9.75 years' experience learning French. Forty-five-minute interviews, involving the researcher and 2 to 4 students, began with open-ended queries about overall experiences (e.g., *How did your collaborative writing experience go?*). Follow-up questions explored perceptions of SWCF's utility (e.g., *To what extent was this experience beneficial for your learning?*), peer interaction during CW (e.g., *What were positive/negative aspects of online peer collaboration for French writing?*), and technical factors (e.g., *How did you feel about the technology in the writing tasks?*). While detailing

interaction patterns and writing processes is beyond the scope of this paper, a screencast software recorded learners' activities during the two CW tasks. This method verified interviewees' claims about actions in Google Docs and adherence to task instructions (e.g., discussing SWCF verbally via videoconferencing instead of chat-based interaction, prioritizing collaboration over cooperation).

Data Analysis

Analysis was initiated by quantitatively examining the post-experimental survey responses. Descriptive statistics were employed to ascertain mean scores for the 13 Likert-scale questions, offering insights into students' perceptions of SWCF during CW tasks. Although the sample size was modest, the study's exploratory nature encouraged us to perform a correlational analysis using SPSS 24.0. This analysis aimed to identify potential relationships among student ratings, akin to Abrams (2019) involving 28 adult German learners and Google Docs.

Subsequently, a content analysis of the transcripts from stimulated recall interviews was conducted through QDA Miner. The use of a semi-open coding approach allowed for the emergence of codes beyond those framed by interview questions (Saldaña, 2013). While some codes were predefined based on research inquiries (e.g., perceived usefulness of videoconferenced SWCF: positive/negative/ neutral), additional codes surfaced during verbatim analysis (e.g., indirect indication of teacher's virtual presence in Google Docs). Two researchers coded 20% of each group interview's data to gauge inter-rater reliability. Cohen's Kappa reliability index stood at 83%. In cases of disagreement, deliberation ensued between the two researchers, with a third party available for consultation.

Results

Post-Experimental Survey

The post-experimental survey asked participants to rate their degree of agreement with different statements about their experience on 1-to-5 Likert scales. No extreme outliers were detected, as assessed by boxplot (i.e., a graphical representation that displays the distribution of a dataset). Since only three participants were outliers, and only for one or two questions each, we did not remove them from the dataset. Not all items were normally distributed, as assessed by Shapiro-Wilk's test ($p < .05$). Table 1 shows the mean (*M*), standard deviation (*SD*), and standard error for each statement.

Table 1

Descriptive Statistics for the Post-Experimental Survey Statements (Students' Perceptions)

Statements	*N*	*M*/5	*SD*
1. I enjoyed participating in collaborative writing tasks.	23	3.39	1.12
2. Collaborative writing tasks are useful when learning a second language.	23	3.70	1.06

Statements	*N*	*M*/5	*SD*
3. I appreciated receiving corrective feedback from the teacher in real time.	23	4.52	0.79
4. Receiving corrective feedback from the teacher while writing is useful when learning a second language.	23	4.56	0.59
5. Receiving corrective feedback from the teacher while writing was distracting.	23	2.39	1.41
6. Discussions with other students in the breakout rooms were useful.	23	3.87	1.22
7. It was easy to collaborate with other students during the writing task.	23	3.13	1.32
8. The technological aspect of this activity was user-friendly.	23	4.21	0.67
9. Before these writing tasks, I had already taken part in online collaborative writing tasks.	23	2.91	1.65
10. The first writing task was a good experience.	23	3.87	1.06
11. The second writing task was a good experience.	23	3.52	1.16
12. I would like to take part in more collaborative writing tasks in the future.	23	3.30	1.29
13. I would recommend this activity for other language classes.	23	3.91	1.04

The results displayed in Table 1 indicate that participants had generally positive views about their experience of receiving SWCF during CW tasks. The perceptions of the items related to CW (Statements 1, 2, 6, and 7), while positive, were closer to neutral than the perceptions of the items related to SWCF (Statements 3 and 4). Synchronous written corrective feedback was overall "enjoyed" (see Statement 3: $M = 4.52$, $SD = 0.79$, 91% strongly agreed or agreed with the statement) and perceived as more "useful" (see Statement 4: $M = 4.56$, $SD = 0.59$; 97% strongly agreed or agreed with the statement). Participants viewed the two tasks as easy to conduct online ($M = 4.21$, $SD = 0.67$; all participants strongly agreed or agreed with the statement, except for three, who had a neutral opinion) and did not find SWCF particularly distracting. However, differences were observed between individuals ($M = 2.39$, $SD = 1.41$; while 61% disagreed or strongly disagreed that SWCF was distracting, 22% disagreed or strongly disagreed). At times, "organizing all of the different ideas" (S15) as a group proved "difficult" (S3, S11, S20), especially in groups where students have "different native languages and cannot understand French with their accent," according to survey comments. While both tasks were mostly rated "a good experience" (Statements 10 and 11), the second task was perceived as slightly less positive than the first (65% and 57% strongly agreed or agreed with the statement, respectively). Due to absenteeism in a couple groups during the second task, one instructor had to slightly alter the group composition, which according to two students was "difficult" because "people

didn't know each other as well" (open-ended question). Finally, while results indicated that students were close to neutral regarding repeating the experience (Statement 12: $M = 3.30$, $SD = 1.29$), less than one third of participants disagreed or strongly disagreed with the statement, while nearly half agreed or strongly agreed that they would be willing to repeat it. Most participants recommended implementation in other FSL courses (Statement 13: $M = 3.91$, $SD = 1.04$, one student strongly disagreed with the statement). Overall, respondents felt that incorporating SWCF to CW tasks "has potential" (S8) and is "very helpful" (S17) (open-ended question).

Since not all items were normally distributed, a non-parametric test (Spearman's rank-order correlation) was used for the correlative analysis, which remains exploratory (Table 2). Based on Abrams (2019), the effect size of $r = .10–.29$ as small, $r = .30–.49$ as medium, and $r = .50–1.0$ as large. Findings indicate that while SWCF items were highly rated in the survey, overall task enjoyment (Statements 10-11) is more strongly related to enjoying CW ($r = .60$ for Task 1, $r = .81$ for Task 2) and finding CW useful ($r = .59$ for Task 1, $r = .68$ for Task 2) than enjoying SWCF (no significant relationship for Task 1, $r = .50$ for Task 2) or finding SWCF useful ($r = .46$ for Task 1, no significant relationship for Task 2). This points to the predominant role of enjoyable collaborative dynamics in the shaping of positive perceptions of SWCF provided during videoconferenced CW tasks.

Table 2

Correlations for the Post-Experimental Survey Statements (Students' Perceptions)

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Statement 1	-												
Statement 2	.60**	-											
Statement 3	.51*	.33	-										
Statement 4	.25	.42*	.34	-									
Statement 5	.04	.16	.48*	.25	-								
Statement 6	.41	.51*	.09	.03	-.08	-							
Statement 7	.71**	.70**	.44*	.39	.20	.77**	-						
Statement 8	.23	.47*	.13	.17	.38	.30	.42*	-					
Statement 9	-.04	.38	-.04	.22	.26	.24	.21	.21	-				
Statement 10	.60**	.59**	.37	.46*	.14	.30	.54**	.59**	-.001	-			
Statement 11	.81**	.68**	.50*	.33	.25	.55**	.83**	.51*	.12	.72**	-		

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13
Statement 12	.77**	.82**	.43*	.27	.17	.52*	.71**	.37	.22	.56**	.77**	-	
Statement 13	.71**	.85**	.32	.52	.23	.57**	.77**	.49*	.19	.65**	.78**	.84**	-

Note. *p <.05. **p < .01.

Similarly, willingness to repeat the experience (Statement 12) is significantly correlated with finding CW useful (r = .77) and enjoying CW (r = .82), but to a lesser extent with enjoying SWCF (r = .43) and is not significantly correlated to finding SWCF useful. Recommending such tasks for other FSL courses (Statement 13) is also significantly correlated with enjoying CW (r = .71) and finding CW useful (r = .85), but not statistically correlated with enjoying or finding SWCF useful. In sum, while learners had very positive views of SWCF overall (Statements 3 and 4), those who enjoyed CW and had positive beliefs about CW were more likely to recommend the tasks. Interestingly, the degree of previous experience with computer-mediated CW (Statement 9) does not significantly correlate with any item.

Stimulated Recall Interviews

Content analysis of stimulated recall interviews confirms that participants generally had positive perceptions despite variable group dynamics. The combination of CW and SWCF appealed to several participants, as exemplified by the following comment: "The most positive [aspect of the experience] was the professor's comments and working together to create ideas" (S8). Participants mentioned that thanks to SWCF, they "knew exactly what *their peers* were trying to say when they corrected [the errors]" (S8), which is not the case with traditional written corrective feedback, as they usually receive feedback "two weeks later" (S1, S2, S3, S4, S6). Synchronous written corrective feedback helped learners to get some errors "out of the way" (S7) and avoid repeating them in the rest of the text (S1). While six interviewees reported enjoying SWCF on grammar (e.g., verb conjugation, gender agreement), vocabulary (e.g., word choice), and syntax (e.g., clause structure, word order), only one suggested that more feedback be provided on text organization.

Indirect SWCF combined with synchronous oral peer collaboration on Zoom "sparked discussions" (S10) and led to "debates" (S5), which were perceived as conducive to learning. As one student put it, "it was cool because when you got the feedback, you could talk to your peers about it as well… so you are getting kind of a double feedback" (S1). Indirect SWCF was also better perceived than direct SWCF, as another participant explained: "It was really good not to give right away the answer, but just a small push or nudge to think again about the sentence" (S6). Peer collaboration helped put students' resources together and obtain "the best of everyone in each sentence" (S1). It also provided "support" and helped to maintain focus on the task (S9).

The task format (a combination of Zoom and Google Docs) felt "normal" (S7, S8) and facilitated group communication. None of the interview participants reported encountering technology-related difficulties while completing the tasks. While group size generally felt appropriate, working in a larger

group (4-5 students) felt "not even feasible" (S7) for a couple students, who would have preferred groups of 2 or 3. Reaching consensus when addressing SWCF and "getting ideas together" without being "all over the place" (S9) were perceived as the main challenges of the tasks, especially given the "time constraint" and the fact that it could be "awkward" to express disagreement with a peer (S8). Table 3 provides an overview of participants' perceptions.

Table 3

Summary of Students' Perceptions About SWCF in Video-Mediated CW Tasks

Themes	Benefits	Challenges
SWCF	Immediacy allows learners to do the following: - remember the idea being conveyed at the time of addressing feedback (vs. delayed CF) - deal with errors right away and therefore avoid future errors in the text - pay more attention to CF (form and meaning) and therefore better remember new words Engagement allows learners to do the following: - improve their text while feeling part of a team - engage in language-related episodes (indirect SWCF) - take more linguistic risks - stay motivated along the writing process	Clarity of feedback: difficulty to understand "what was wrong" with a word or a sentence Error treatment: possible uncertainty as to whether SWCF is satisfactorily addressed Possible (but limited) distraction from the writing process when SWCF "pops up"
Video-Mediated Synchronous Collaborative Writing	- learn from one another and improve one's L2 writing - see "other humans" and "talk" with peers - stay focused on the task by "working together" and "supporting each other" - receive both peer and teacher feedback ("double feedback")	- difficulty to work with peers with different L2 proficiency levels - difficulty to set an efficient collaborative pattern - hesitation to point out peers' errors or criticize peers' ideas - - difficulty to interpret "body language" on Zoom

Participant suggestions for future iterations targeted feedback. First, the use of more detailed forms for indirect written corrective feedback (e.g., comments with metalinguistic cues) would be beneficial to not "puzzle over" some of the highlighted errors (S10). Teachers could space out SWCF instead of adding waves of comments or highlights "all of a sudden" (S2) which, according to S4 and S7, can be "overwhelming" (during the experiment, teachers added series of SWCF as they navigated between their browser tabs). Three interviewees suggested the teacher provide less SWCF during each visit of a CW group's Google Docs but increase the frequency of the visits. This way, students would have "not ended up with all these comments [at the same time]" and would be able to process SWCF in a more digestible way (S2). Moreover, teachers should dedicate time after the task to provide "overall" feedback to the class (S6, S7), focusing on errors that students seem to "keep repeating" (S10). Other suggestions included "allotting more time" for task planning and realization (S7) as well as setting standards for SWCF (S3, S10), that is, using different colours for teachers and students, or relying on a letter-coding system to identify error types.

Discussion

To the best of our knowledge, this is the first study to explore FSL learners' perceptions of SWCF provided during two videoconferenced CW tasks completed using Zoom and Google Docs, in the context of an online course. Results point to the learning potential and feasibility of this pedagogical practice.

Research Question 1: Perceived Learning Value

In line with recent computer-mediated CW studies (Li, 2018; Ubaldo, 2021), most interviewees (60%) expressed positive views about video-mediated CW tasks including SWCF, as they found them "useful" (S7, S10) and "definitely helpful" (S1, S5) for enhancing L2 writing skills.

One perceived benefit of teacher SWCF was that it prompted discussions on form and meaning within CW groups. Immediate feedback via Google Docs enabled learners to address errors promptly and collaboratively, leveraging their linguistic resources, thus avoiding repeating them. While such a finding is not novel (e.g., Shintani, 2016; Shintani & Aubrey, 2016) since "video-mediated [videoconferenced] collaborative writing reflects the normativities of talk-in-interaction" (Balaman, 2021, p. 13), it could be argued that video-based interactions further facilitated peer interactions around SWCF. Besides, participants noted that peer discussions through videoconferencing enabled them to address both semantic and linguistic dimensions of L2 writing. In contrast to previous studies favouring teacher feedback over peer feedback, this study did not reveal such a trend (Cho, 2017; Ebadi & Rahimi, 2017).

Analysis also revealed learners' preference to focus on lexical and syntactic issues, rather than text organization, confirming Amrhein and Nassaji's (2010) results. Moreover, participants found more learning value in indirect SWCF, noting that teachers' highlights or comments gave them "a small nudge" to revise sentences (S6). This preference is in contrast with findings from Kim, Kang, Choi, et

al. (2020), which observed no distinction in the perceived helpfulness of direct versus indirect SWCF for in-person CW tasks. Divergent study designs and contexts may explain these differences. This study involves advanced FSL learners, while beginner Korean learners were examined by Kim, Kang, Choi, et al. (2020). The presence of written comments in this study might have influenced the preference for indirect SWCF, particularly with advanced learners having the metalinguistic capacity to collaboratively address it.

Research Question 2: Perceived Feasibility

The implementation of SWCF during videoconferenced CW tasks was perceived as straightforward. In line with Abrams (2019), no technology-related concerns were expressed, and learners found receiving feedback on Google Docs and discussing it through Zoom to be "user-friendly" (S9). Past CW experience did not significantly affect task enjoyment, as revealed in the post-experimental survey. The normalization (Bax, 2003) of videoconferencing resulting from the COVID-19 pandemic was evident in comments like "for me it was just a normal breakout room discussion" (S8). Given that practicality is a key element of the evaluation of computer-assisted language learning tasks (Chapelle, 2001), the results reflect the feasibility and pedagogical potential of videoconferenced CW. While acknowledging that Zoom is different from in-person interaction, participants noted the human contact was maintained during writing, emphasizing the value of seeing partners' faces (S3). This resonates with studies suggesting higher engagement and focus on video-chat interaction during CW as compared to chat-based interaction (Aubrey, 2022).

Participants mentioned challenges such as the difficulty in critiquing peers' suggestions and voicing their opinions. In other words, videoconferenced CW did not necessarily enhance perceptions of peer feedback compared to chat-based computer-mediated CW studies, in which learners often questioned the benefits of peer collaboration (Li & Zhang, 2022). Moreover, participants sometimes struggled to immediately understand what was wrong with their sentences (S8), echoing Kim, Choi, Yun, et al.'s (2020) results. Waves of SWCF were also perceived as "overwhelming" (S4, S7), potentially limiting feasibility although this might have led learners to appreciate peer collaboration. Video-based interaction could have reduced cognitive overload, as SWCF is less cognitively demanding than delayed written corrective feedback (Shintani & Aubrey, 2016). This would concur with the fact that nearly two thirds of survey respondents did not find SWCF particularly distracting (Statement 5) or that SWCF was perceived by interviewees as "a good disruption" (S6, S7) to the writing process.

Pedagogical Implications

This study has important implications for L2 teachers contemplating the integration of videoconferenced CW tasks with SWCF. First, allocating ample task time is crucial. Participants noted that time-consuming negotiations of meaning and form after SWCF often hindered text completion within class time. Educators should consider task durations that accommodate these interactions effectively. Second, teachers might establish pre-set feedback styles, using letter or colour codes for quick error identification and resolution. Enhancing indirect SWCF through written comments, like metalinguistic cues in margins, could lead to faster error resolution. Last, instructors should schedule

post-task debriefings to offer broader feedback on strengths and areas for improvement. These discussions could take place with the whole class (either in person or on Zoom) or in smaller chat rooms, as suggested by Ene and Upton (2018).

Conclusion

This study was the first to explore learners' perceptions of combining SWCF and CW in two videoconferenced tasks completed on Google Docs via Zoom. The results indicate that overall learners value this pedagogical approach as it provides them with relevant SWCF and the opportunity to collaboratively negotiate form and meaning. This alignment with prior face-to-face SWCF and CW research contributes to the field by addressing Kim, Choi, Kang, et al.'s (2020) call to examine learners' perceptions of SWCF in new contexts, as seen in our videoconferenced CW setting. The findings also show that videoconferenced CW could be a valuable alternative to conventional CW, facilitating the provision of SWCF while sparking group discussions.

A noticeable difference from earlier research lies in the preference expressed by our participants for indirect versus direct SWCF. Despite the challenges inherent in addressing indirect SWCF, participants found discussing it on Zoom to be "normal" (S7, S8), with the immediate collaboration via videoconferencing alleviating the "stress" linked to SWCF (S9). Essentially, videoconferenced CW presents an optimal pedagogical configuration combining the reduced anxiety linked to computer-mediated communication (Côté & Gaffney, 2021) and the dynamic collaboration patterns typically seen in face-to-face interactions (Kim, 2014).

While precautions were taken to enhance result validity, this two-time intervention study has limitations. In one class, time constraints led to a 5-minute reduction in Task 2, potentially impacting perceptions. Teachers' choices to focus on local issues and provide indirect versus direct SWCF may have also influenced learners' perceptions. However, the study's ecological approach strengthens its authenticity.

Based on findings, future research should investigate optimal teaching practices to support videoconferenced computer-mediated CW (e.g., examining the relevance of teacher-students videoconferenced interactions to complement SWCF). Assessing learning gains could also help to determine the most effective types and amount of SWCF. Additionally, as per Yamashita (2021), future studies should take into account learning styles and target different learning contexts.

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Appendix

Instructions for Tasks 1 and 2

Composition collaborative 1

Consignes

Étape 1 : Plan du texte

- **Prévoir 5 minutes maximum** pour faire un plan: parlez de la structure et des idées principales.

Étape 2 : Rédaction collaborative

- **Travaillez ensemble sur le même paragraphe : ne vous séparez pas les parties du texte.**
- Discutez du contenu et de la forme: si vous avez des questions sur la façon d'écrire, sur le sens d'un mot, sur l'orthographe, sur les accords, **parlez-en en équipe.**
- Vous pouvez utiliser tous les outils pour vous aider (WordReference, dictionnaires en ligne, conjugueur, etc.
- Quand vous voyez des commentaires du professeur, **discutez-en en groupe** pour corriger l'erreur.

Rédaction du texte

Vous allez travailler en groupe de 3 ou 4 pour rédiger une composition de **400 à 500 mots** en lien avec une polémique d'actualité :

Dans le contexte actuel de pandémie, certains proposent de rendre obligatoire la présentation d'une preuve de vaccination pour n'importe quelle personne souhaitant avoir accès à des services (restaurant, spectacle, voyage en avion, etc.). Le but est de permettre à la société de retourner rapidement à « la vie normale ».

Que pensez-vous de cette proposition? Rédigez en équipe un texte argumentatif pour donner votre avis.

Composition collaborative 2

Consignes

Étape 1 : Plan du texte

- **Prévoir 5 minutes maximum** pour faire un plan: parlez de la structure et des idées principales.

Étape 2 : Rédaction collaborative

- **Travaillez ensemble sur le même paragraphe : ne vous séparez pas les parties du texte.**
- Discutez du contenu et de la forme: si vous avez des questions sur la façon d'écrire, sur le sens d'un mot, sur l'orthographe, sur les accords, **parlez-en en équipe.**
- Vous pouvez utiliser tous les outils pour vous aider (WordReference, dictionnaires en ligne, conjugueur, etc.
- Quand vous voyez des commentaires du professeur, **discutez-en en groupe** pour corriger l'erreur.

Rédaction du texte

Vous allez travailler en groupe de 3 ou 4 pour rédiger une composition de **400 à 500 mots** en lien avec une polémique d'actualité :

Hier, le gouvernement du Québec a annoncé la fermeture des gyms en zone rouge et a indiqué que le couvre-feu pourrait bientôt passer de 21h30 à 20h à Montréal. Le milieu médical a applaudi ces décisions et pousse pour encore plus de restrictions. D'autres personnes estiment cependant que la population a besoin d'air et qu'il faut accepter les risques sanitaires pour la santé mentale de tous.

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A Collaborative Story Writing Project Using Google Docs and Face-to-Face Collaboration

Un projet collaboratif d'écriture d'histoires utilisant Google Docs et la collaboration en face à face

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Abstract

The Google Docs application is part of Google Workspace for Education, a suite of cloud-based productivity and collaboration tools that are now ubiquitous in middle and high school classrooms. While there is an expanding body of research documenting the benefits of using Google Docs to support collaborative writing projects, there exists few qualitative studies detailing how cloud-based tools are integrated into courses that meet face-to-face on an ongoing basis. This case study explores how an experienced high school English teacher facilitated a collaborative writing project, in which students used Google Docs to co-write a story. The students were instructed to work on their stories asynchronously from home and synchronously during face-to-face classes. Data sources included field notes from class observations, reflections written by the teacher, semi-structured interviews with the teacher, focus group interviews with the students, and the shared Google Docs. This article describes affordances and constraints associated with the pedagogical supports provided during the collaborative writing process and offers recommendations for teachers who intend to use Google Docs to facilitate collaborative writing projects.

Keywords: collaborative writing; face-to-face collaboration; Google Docs; writing pedagogy

Résumé

L'application Google Docs fait partie de Google Workspace for Education, une suite d'outils de productivité et de collaboration infonuagiques qui sont maintenant omniprésents dans les classes du secondaire. Bien qu'il existe un nombre croissant de recherches documentant les avantages de l'utilisation de Google Docs pour stimuler les projets d'écriture collaborative, il existe peu d'études qualitatives sur la manière dont les outils infonuagiques sont intégrés dans les cours en personnesur une base continue. Cette étude de cas explore comment un professeur d'anglais expérimenté au secondaire a

facilité un projet d'écriture collaboratif, dans lequel les élèves ont utilisé Google Docs pour co-écrire une histoire. Les élèves ont été invités à travailler sur leurs histoires de manière asynchrone de la maison et de manière synchrone pendant les cours en face à face. Les sources de données comprenaient des notes de terrain tirées d'observations en classe, des réflexions écrites par l'enseignant, des entrevues semi-structurées avec l'enseignant, des entrevues de groupe de discussion avec les élèves et les documents Google partagés. Cet article décrit les affordances et les contraintes associées aux soutiens pédagogiques fournis pendant le processus de rédaction collaborative et offre des recommandations pour les enseignants qui ont l'intention d'utiliser Google Docs pour faciliter les projets d'écriture collaborative.

Mots-clés : rédaction collaborative ; Google Docs ; collaboration en face à face ; pédagogie de l'écriture

Introduction

Recently, there has been heightened interest in collaborative writing in both research and teaching, a trend that is due in part to the increasing capabilities of Web 2.0 technologies. Cloud-based writing applications allow people to create, store, and share documents across platforms and devices, creating new avenues for collaboration (Slavkov, 2015). DeVoss et al. (2010) explain that "student writers still need thoughtful and well-prepared teachers and mentors. Computers will not replace teachers, nor should they. Teachers of writing have a crucial role in supporting students in understanding the complexities of communicating in a twenty-first-century world" (p. 2). Integrating collaborative technologies can help teachers align writing assignments with the real-world activities of professionals in practice (Reeves et al., 2002).

The present case study examines how an experienced high school English teacher facilitated a collaborative story writing project using Google Docs. The students collaborated through two modalities: Google Docs and face-to-face. Before presenting the findings, an overview of sociocultural theory and its implications for writing pedagogy is presented alongside a review of literature on the use of Google Docs to support the collaborative writing process.

Sociocultural Theory and Writing Pedagogy

Vygotsky's (1930/1978) sociocultural theory of learning proposes that learners acquire advanced cognitive skills through socially-mediated activity within particular social and cultural contexts. Dynamic interaction (between teacher and students, as well as between and among students) is a key feature of writing classrooms informed by sociocultural perspectives on learning. Englert et al. (2006) explain that "working with peers helps students externalize covert processes, making them transparent to the implementor and to the other participants in the interaction" (p. 210).

Another implication of sociocultural theory for writing pedagogy is that teachers provide "procedural facilitators" to offset the cognitive demands inherent in the writing process (Englert et al., 2006, p. 211). As a procedural facilitator, Google Docs offers numerous features that support writing and collaboration, including document sharing, synchronized editing, suggesting and commenting,

spelling and grammar check, version history, and integrated reference tools (Alwahoub et al., 2020; Oxnevad, 2012).

Google Docs to Support Collaborative Writing

With Google Docs becoming more prevalent in education, research on the use of this technology to support the collaborative writing process is expanding. Much of the existing research has taken place in postsecondary contexts, with a few recent studies carried out in K-12 settings. This literature review focuses on students' perceptions of Google Docs, the implications of using Google Docs on text quality and writing performance, and the pedagogical design of a Google Docs project in a K-12 setting.

Student Perceptions

Numerous studies have explored student perceptions of using Google Docs to facilitate the collaborative writing process. Liu and Lan (2016) compared the perceptions of students who spoke English as a foreign language on using Google Docs to complete a university assignment collaboratively versus individually. Two classes were randomly assigned to the experimental group (the collaborators) and the control group (the individuals); follow-up questionnaire results showed that the collaborators had higher levels of motivational beliefs and self-efficacy, while reporting more positive perceptions towards learning with Google Docs. In Khoiriyah's (2021) study, first-year students of English at a university in Indonesia wrote as a team using Google Docs in a synchronised manner. When surveyed on their experiences, the highest average of positive responses related to students' perception that every group member actively participated when working together online; the students valued the opportunity to work synchronously with their peers using an online platform, yet they also indicated a preference for doing group work face-to-face. While students' perceived comfort levels with Google Docs was high, they reported challenges, such as confusion about some of the available features, time constraints, and issues with Internet connectivity.

Meanwhile, Zhou et al. (2012) explored the experiences of American undergraduate students using Google Docs for an out-of-class collaborative writing activity. At the outset, most students were unfamiliar with Google Docs. Nevertheless, they utilized the technology successfully for group collaborative writing, and most of the students rated their experience using Google Docs positively. Despite this finding, difficulties with the Google Docs tool were reported. For example, students noted that Google Docs had formatting that was incompatible with other offline word processing applications, and they experienced challenges moving back and forth between documents. Zhou and his colleagues caution that challenges associated with Google Docs may result when students do not fully understand how to use the features of the tool.

Another consideration that may influence the perceived effectiveness of Google Docs is the extent to which students have developed the skills for effective online collaboration. Vallance et al. (2010) explain that "while online collaboration tools can facilitate interactions between teachers and students, not all individuals or groups automatically possess the knowledge, attitudes, and sensibilities to

work together online" (p. 22). They further suggest that online collaboration tends to be more effective if participants have established shared knowledge and interests through face-to-face relationships before they collaborate online.

Text Quality and Writing Performance

Strobl (2014) inquired, "can online collaboration yield a positive result on academic writing in a foreign language?" (p. 1). The participants, Dutch university students learning German, were asked to complete a writing assignment in which they synthesized information from multiple sources, both individually and collaboratively, using Google Docs. There were no statistically relevant differences between the individual and collaborative texts when measuring complexity, accuracy, and fluency. However, the collaborative texts scored higher on content selection and organization. The researchers attributed this finding to in-depth planning discussions, which were facilitated through an online forum. While the forum proved to be an effective communication tool, the student participants felt it was inconvenient for synchronous planning and suggested that the collaborative planning take place face-to-face rather than online.

Bikowski and Vithanage (2016) investigated the effects of online collaborative writing on the individual writing scores of second language learners at an American university. The experimental group completed four in-class writing tasks collaboratively, while the control group completed the same four writing tasks individually. Both groups used Google Docs and they received feedback on their strengths and areas for improvement. Pre- and post-tests revealed that the students in the collaborative writing condition showed statistically significant gains in their individual writing scores over and above the gains demonstrated by the students in the individual writing condition. Similarly, Alwahoub et al. (2022) compared the gains in individual writing performance of Grade 4 students in an experimental group, which engaged in synchronous collaborative writing assignments via Google Docs, and a control group, which conducted the same writing assignments individually using pen and paper. Significant differences were found in the post-test scores of the experimental group, but not the control group. The researchers concluded that synchronous collaborative writing through Google Docs had a positive impact on the development of individual writing.

Two studies comparing the writing scores of students collaborating online through Google Docs versus face-to-face produced contradictory results. Suwantarathip and Wichadee's (2014) study involved more than 5,000 students enrolled in an English course at a university in Thailand. The researchers assessed the content, language, and organization of the students' collaborative writing projects using a standardized rubric and determined that students collaborating via Google Docs had higher mean scores compared to students collaborating face-to-face. Students in the Google Docs group also reported positive attitudes towards the writing activity and high levels of collaboration. Meanwhile, a study by Woodrich and Fan (2017), with close to 100 eighth graders, showed that students working in groups of four scored higher on a writing task conducted face-to-face compared to writing tasks completed using Google Docs. And, while face-to-face writing tasks resulted in greater overall scores, the researchers explained that the use of Google Docs led to higher levels of participation among the

English language learners, particularly when they were anonymous to their peers, as this may have lowered their affective filters.

In summary, collaborative writing through Google Docs has been shown to support the development of individual writing abilities (Alwahoub et al., 2022; Bikowski & Vithanage, 2016) and to facilitate high levels of participation and collaboration (Khoiriyah, 2021; Suwantarathip & Wichadee, 2014). Suwantarathip and Wichadee (2014) explain that "for Google Docs, the students know that the teacher can check who works less or more throughout the learning process. As such, students in the Google Docs group were more serious about collaborating" (p. 154). The research also points to potential benefits of providing opportunities for other modes of communication in addition to Google Docs, such as online forums (Strobl, 2014) or face-to-face collaboration (Khoiriyah, 2021). The present study explores both the benefits and constraints of including a face-to-face component alongside the Google Docs tool.

Pedagogical Design of Google Docs Projects

Research exploring the pedagogical design of Google Docs projects within K-12 courses is beginning to emerge. One example is a study involving fourth-grade students and adult coaches who provided feedback on the students' writing (Abell, 2013). The coaches were members of the school community and included classroom teachers, a special education teacher, teachers of art, music, and physical education, the school principal, librarian, and counsellor. Coaches were given training on Google Docs and on best practices for providing feedback; they were informed that "the goal was to encourage *revision* through revisiting and clarifying the story rather than simply informing students about what to fix or edit" (p. 33). Students were taught how to "invite" their coach to read and comment on their story. There were six writing sessions, during which students could begin a new topic, or respond to feedback provided by their coach. The findings showed that

> Google Docs helped develop an immediate and ongoing relationship between students and coaches, even though they did not meet face-to-face. When students understood that they had a specific audience excited to read their revisions, it motivated them to want to write better. (p. 34)

An assessment rubric showed that the students demonstrated improvement in their writing, especially in their use of expressive language.

The current study adds to the research on the pedagogical design implications of integrating a project using Google Docs within a K-12 face-to-face course. Specifically, this study examines how a high school English teacher facilitated a collaborative writing project that blended Google Docs with face-to-face collaboration. The study considers both the teacher's and students' perspectives on the affordances and constraints associated with the pedagogical supports provided during the collaborative writing project. While a growing number of studies have explored students' perceptions of using Google Docs for collaborative writing projects, there is a lack of research examining teachers' experiences and perceptions, a gap that this study seeks to fill.

Methods

This case study took place amidst a large curriculum redesign effort in the province of British Columbia, Canada. The focal course was *New Media 11*, a new English Language Arts curriculum created "to reflect the changing role of technology in today's society and the increasing importance of digital media in communicating and exchanging ideas" (British Columbia Ministry of Education, 2018, p. 1).

The Context

The case study context was an independent high school, which enrolled both Canadian and international students. The focal class was small, with only nine students, eight of whom volunteered to participate in the study portion of the project. The participating students originated from Canada, the United States, Singapore, Vietnam, Ghana, Russia, and the United Kingdom. Two participants were non-native English speakers who demonstrated high levels of fluency in English. The teacher, Mr. Towers (pseudonym), had 12 years of teaching experience. The year prior to the study, he had undergone training on the use of the G Suite for Education (now Google Workspace for Education) tools, and he chose to participate in the study to gain a deeper understanding of how a collaborative writing project using cloud-based tools could be used to improve teaching and learning within his diverse instructional context.

The school was a 1:1 Chromebook school, meaning that all the teachers and students had their own Chromebooks (small laptops running the Google Chrome operating system). From their personal Chromebooks, teachers and students log into their Google accounts to access a set of cloud-based applications that facilitate communication and collaboration. One of these applications is Google Docs, which was used in the collaborative writing project that is the focus of the present study.

Guiding Question

The question guiding this study is: What affordances and constraints were associated with the pedagogical supports provided as students engaged in the collaborative story writing project using Google Docs? This question is answered through the triangulation of field notes taken during class observations, the teacher's written reflections, a post-project interview with the teacher, and focus group interviews with the students. The data sources were analyzed using NVivo, with codes derived from iterative readings of the field notes, interviews, and teacher reflections. The students' shared Google Docs were also examined to corroborate findings from the primary data sources.

The Procedure

The first phase of the study involved a pre-project interview with the teacher to gain an understanding of his prior experiences supporting students in a cloud-based learning environment and facilitating collaborative writing activities. During this phase, the teacher and the researcher also discussed ideas for the collaborative writing project, drawing on prior experiences and key learnings

from research. Sample questions from the pre-project interview with the teacher are included in Appendix A.

In the second phase, the teacher taught a narrative writing unit. Before the story writing project was introduced, the teacher facilitated lessons focused on setting, character, and conflict. He assigned pre-writing tasks, four of which used Google Docs:

#1: Describe a place that is important to you in 5 sentences (individually).

#2: Find an image of a scene online and write a paragraph describing the scene (collaboratively).

#3: Choose an image of a person who is not famous and write a half-page description of the person (collaboratively).

#4: Describe 3 conflicts the person/character you chose in #3 could be facing (collaboratively).

The culminating project was to "write a well-written, creative, and engaging short story that uses the given topic [the future] in some significant way." Approximately 10 classes were devoted to the story writing process, which included planning, writing, editing, and revising. Students were assigned in pairs and one triad because the total number of class members was uneven. They were expected to use Google Docs to write their stories, and were instructed to work on their writing from home and during class. To facilitate the planning process, the teacher provided each group with a large sheet of paper and each student with a marker of a different coloured ink, which represented their voice. Each group wrote "the future" in the middle, and then each student wrote ideas about what this topic means to them. Afterwards, they shared their ideas orally with a partner, and they were each responsible for relaying their partner's ideas to the class. Later, the teacher shared a Google Doc with each group that contained questions to help the students begin planning ideas for setting, characters, conflict, and plot development. The teacher suggested that they could chat, write, or do both as they planned their stories, and once students had flushed out their ideas, they could begin writing.

During face-to-face writing sessions, students sat in table groups with their collaborators, and each of them had the shared Google Doc open on their individual Chromebook. While the students were collaborating and writing, the teacher acted as a facilitator and provided ongoing feedback. Part way through the writing process, Mr. Towers focused part of a class session on peer editing. As a class, they brainstormed what to look for when editing, and then he projected an excerpt from one group's story and demonstrated how to add comments and suggestions. After, he instructed the students to exchange their Google Doc with another group so they could engage in the peer editing process. In another class, he invited students to read their stories aloud to the class. Throughout the unit, the researcher observed the lessons and took field notes, and the teacher wrote ongoing reflections.

In phase three, the researcher conducted post-project semi-structured focus group interviews with participating students and a one-on-one semi-structured interview with the teacher to gain further insight into the students' and teacher's experiences with and perspectives on the collaborative writing project. Sample questions from the focus group interviews with the students and sample questions from the post-project interview with the teacher are shown in Appendix B and C, respectively.

Findings

The findings focus on the affordances and constraints associated with three key aspects of the collaborative writing project in the focal classroom: teacher feedback, Google Docs as a procedural facilitator, and face-to-face collaboration.

Teacher Feedback

A key finding was that the feedback process was integrated seamlessly with the writing process when using Google Docs. As Mr. Towers explained,

> it's easier for me to quickly look at their story or paragraph and make a comment or make a quick little suggestion or a change, more so than having to take their paper away from them and then go through it and then they sit idle. I can do it in real-time or simultaneously… .

The teacher reviewed the students' Google Docs as they were engaged in the writing process, and was able to identify areas for growth and provide support accordingly. For example, he noted that students were struggling when incorporating dialogue within their stories, so during class he shared a website that provided rules on formatting dialogue. In the post-project interview, Mr. Towers reflected,

> It wouldn't be something I would focus on normally, but it was more just a reaction to how they were writing. … It was unclear who was speaking when they were using dialogue, so it would be all blocked together without he said, or she said, or Jane said, or John said. It would get muddled… .

The teacher explained that one of his roles was to provide "suggestions for enhancement of story elements and plot development" and a student described him to be "an overseer of corrections and ideas." Mr. Towers provided feedback both orally and through Google Docs. Many of the suggestions he gave orally pertained to word choice and using more descriptive language. Through Google Docs, Mr. Towers used both direct feedback (i.e., suggestions that students could accept or reject) and indirect feedback (i.e., comments or questions for students to consider). The "suggesting" function allows an editor to suggest a revision, which is shown in coloured font within the text and elaborated on in the right sidebar of the document (e.g., replace "sent" with "deployed"). The authors can then click on the "√" to accept or the "×" to reject the suggestion. For the "comment" function, an editor highlights a part of the text and writes a note or question, which also appears in the right sidebar of the document.

A key affordance of the teacher's feedback was that it facilitated the students' learning and the development of their stories. A student observed, "he could make the changes that we couldn't do… and point out the grammatical mistakes that we made that we missed…," and another student noted, "he suggests where to improve, where to add something, correct, and yeah, I think it helps a lot. And, you actually learn something from it because you see your mistakes, and yeah, you improve them yourselves… ." Another student reflected, "when there were points where I wasn't sure where to continue, he would help me, give ideas on how I should continue the story… ."

In the post-project interview, Mr. Towers noted that students may accept his suggestions without considering them carefully. He explained,

> I think they responded better when it was a more detailed comment or suggestion. I did briefly go over the process of accepting or rejecting comments in Google Docs, and I think that improved things slightly. There's a tendency for students to just hit the check mark or there's an option to accept all with one click of the button and then it just changes everything… .

In the focus group interviews, some students indicated that they contemplated the teacher's suggestions. For example, a student noted, "we didn't listen to all of them, but yeah, we took his advice, or we didn't." Other students accepted the teacher's suggestions because the changes improved their writing. A student explained, "I chose 'resolve all of them' because it was grammatical issues or maybe his word choice was maybe a bit better or maybe helps with the flow of the sentence." Meanwhile, two students noted that they were inclined to accept Mr. Towers' suggestions because "he's the teacher." Aware of this tendency, the teacher explained that "rather than making a suggestion as an edit, I find sometimes asking a question or making a statement on a certain section is better because then they are forced to either respond to that or ask me a follow-up question."

A notable constraint associated with the use of Google Docs for collaborative writing projects is that when one student accepts the suggestions or resolves the comments, the feedback is no longer visible on the main page of the document. This is a limitation, because if one student resolves the teacher's suggestions before their collaborator(s) read them, not all students have an opportunity to learn from the feedback provided.

The findings also indicated that the teacher's feedback provided via Google Docs sometimes lacked clarity. The teacher used abbreviated editing symbols (e.g., wc = word choice; sp = spelling). Mr. Towers reflected,

> My shorthand did confuse some students, so I'm used to teaching all the students, and some students are new, so the students who have had me before knew the terminology, but some of the newer students didn't. … Yeah, I probably took that for granted more than I should, that they would know that… .

Importantly, lack of clarity regarding the teacher's feedback was highlighted by both the non-native English speakers. In the focus group interviews, one of the non-native English speakers commented, "sometimes we didn't know how to correct it. He didn't tell us how to correct it; he just pointed [out] the mistake." I asked him what he did in that case, and he said, "I just left it there." During class, the other non-native English speaker remarked to the teacher, "you showed us our mistakes, but we don't know how to correct them." Mr. Towers responded by sitting down with the student to help him respond to the feedback, and because of this student–teacher conference, none of the suggestions or comments on this group's story was left unresolved.

Google Docs as a Procedural Facilitator

The "suggesting" and "comment" functions were features that the teacher and students could take advantage of during the writing process. The findings showed several other affordances and a few constraints associated with the use of Google Docs. For example, the students and teacher appreciated the ease with which the Google Doc could be shared and the ability for the collaborators to edit the document simultaneously and to see the changes in real-time. One student noted, "it's very easy for multiple people to use it because of the ability to share the document and you can both type into it," and another student explained, "it's very easy because you see what your partner does; every second, it changes… ." The teacher also commented, "the live editing, or simultaneous editing, sharing of the doc; these are all things that I really like and I think the students like." While both the teacher and students appreciated the ease with which the document could be edited by multiple people, a couple of students noted a reluctance to revise their peers' writing in case it might hurt their feelings or cause unwanted conflict.

Mr. Towers valued being able to monitor his students' progress through Google Docs because all revisions are recorded. He explained, "for the version history, you can see how much they've done. You can see when it was last edited very quickly, so you know if they did the homework or not… ." This can be seen as a disadvantage from the perspective of a student who has not done their homework. A student reflected, "your teacher and your classmates can see that you actually did nothing, so that's not good."

Another feature of Google Docs that was found to be useful was the built-in grammar and spell check. A student explained, "if there was a spelling error, of course, Google Docs would say that there was an error." Students also appreciated that their work was stored online, so that it was accessible from anywhere and was less likely to become lost. One student observed, "you can bring it with you. You can work from far away." Another student noted, "I like how the files are saved online, so you don't have a risk of losing them." The teacher agreed that the online storage made the document more accessible; he explained, "you know that they have access to this document; they can't lose it. And, if one student doesn't bring their Chromebook, then at least they still have the document on another one or something like that, right, so it's accessible... ." Importantly, online storage makes the document more accessible if there is a reliable Internet connection and students and teachers have access to their Google accounts.

Using a Chromebook was also helpful because it allowed students to use online reference tools. For example, in the focus group interviews, a student confirmed that she used a magic name generator, while another student noted that he used an online thesaurus. Although it was beneficial to have access to online references tools, working on the Chromebooks was also a distraction for some students. For example, a student talked about accessing *BuzzFeed*, an online news website, during class, and another student elaborated, "if your mind is on something else, when you have the Chromebook, you can look up anything you want."

Another constraint was that the students lacked understanding of how to use certain features of Google Docs effectively. Mr. Towers explained,

> They are used to [Google Docs], but I don't think they know how to use them in the most efficient way, so that's what I was trying to do throughout the project. So, things like the comments, making the comments, and actually reading them, and not just hitting the '√' or the 'x,' or even something simple like that. It's interesting to note that they viewed the 'x' as a close button, not a reject button, because in all other applications, the 'x' just means close the window, but it actually means that that suggestion or edit will be rejected so then nothing gets changed, but you get rid of that little window. So, little things like that where you can improve their understanding of the application is helpful.

The teacher had a good understanding of the Google Docs application, and was able to provide guided support.

Overall, the teacher and students in the focal classroom held positive perceptions of using Google Docs. Cloud-based tools allow students to write from any place at any time, but not all participants were inclined to work on their collaborative writing projects outside of class time, and Mr. Towers expressed concern that if the entire project was assigned to be completed for homework, one person may end up writing the whole story. To support the collaborative writing process, the teacher provided students with numerous class periods to write face-to-face with their collaborators. The affordances and constraints of face-to-face collaboration will be discussed next.

Face-to-Face Collaboration

A key feature of the collaborative writing project in the focal classroom was that Mr. Towers provided extended opportunities for students to write using the Google Docs tool while sitting together in class. According to the teacher, an affordance of face-to-face writing is that students receive immediate feedback. He explained,

> I think face-to-face is very helpful and the ability for them to ask a question or get clarification on an idea, or bounce an idea off somebody is much easier than sitting at home and writing a comment on Google Docs and waiting for a response. So, it's just the immediate feedback is important.

As the students began writing, it became apparent that they were facing difficulties combining their diverse ideas into one story. In the focus group interviews, a student reflected, "we had different opinions, ideas, so it's hard to put it in together." And, another student commented, "two is okay, but three is a crowd… there were so many people working on the same document and then all of our ideas would just clash… ." There was also a lack of communication between and amongst collaborators, with a student observing, "we didn't actually communicate much about it; we just wrote the story," and another reflecting, "we didn't really have much communication because we didn't really have chemistry in our group." Due to these challenges, students expressed that they would have preferred to work alone or to choose their collaborators so they could work with someone with whom they had more familiarity.

Importantly, students also indicated that face-to-face collaboration could improve the communication between collaborators. One student commented,

> if you see them use the wrong word or something like that, you could just right away say that to them and let them know, or even teach them if you want. … It's just way [easier] to communicate with them and… get things done I find… ,

and another participant noted,

> I feel being… face-to-face a lot better for this type of thing 'cause you get everything from them... I guess the body language and stuff, like if someone doesn't feel comfortable, maybe you could change something to be more of their liking.

The face-to-face classes also provided an opportunity for Mr. Towers to facilitate the collaborative process. During class, two students expressed concern about revising a part of their story that had been written by a classmate who was now absent; they did not want to hurt their peer's feelings. Mr. Towers suggested that they could add comments into the Google Doc instead of changing what their peer had written. He also demonstrated on the board how they could add to each paragraph; he explained that they could add in sections and then move sections. In another class meeting, Mr. Towers assisted two students to sort out a disagreement they were having about whether a transition was necessary between two paragraphs within their story. A student reflected in the focus group interviews that he appreciated that his teacher could act as a "moderator" or an "outside party" who can "judge [the] story, without preference for one person or the other's ideas to be more shown than the other."

Writing synchronously while sitting together during class also enabled the students to receive help from the wider class community, as noted by the teacher in his reflections and in the post-project interview: "students are also using their group members and the larger class for suggestions…," and "I recall a comment where one group was asking a question and then another group chimed in. … I think having collaboration from group to group was helpful too." An example of this occurred during one of the pre-writing activities when a student called out to the class searching for a negative word for magic and a classmate from another group suggested "sorcery" or "witchcraft." A student reflected that the small class size made it easier to be "more vocal" about their work.

Another affordance of face-to-face writing was that students received more immediate support from the teacher. During class, students requested that Mr. Towers look over their stories and they also asked him questions. For example, a student approached his teacher to ask how much dialogue is too much. Mr. Towers advised the student to find a balance between dialogue and narration. He explained that when there is too much dialogue, the story can only move at the pace of the conversation, but with narration, the character can go off and do other things. It was evident that the student learned from this interaction as he explained in the focus group interview that he used less dialogue part way through so that he could provide more description of what was happening to move the story along.

A key constraint of the face-to-face writing sessions was that some students would become distracted and lose focus. In the focus group interview, a student commented, "even when we're doing the work, sometimes things can be you know a little bit funny, and then someone laughs a bit louder and it makes it even more funny." Another student explained that "you get vibes off other people. … it kind of spreads through the whole class… By the end, …we're all just talking about some random stuff."

Despite the distractions, some students preferred doing their work at school than at home. A student reflected, "you don't feel as bored. … when you are in a group, you are all talking and laughing and joking around, but at the same time doing your work." Another student explained, "I get more work done at school than I do at home, so that's usually when I did my work," while someone else noted, "in class, you can keep your partner's ideas towards the story, try and develop it instead of just playing around."

Mr. Towers observed that students were sometimes tired and that when one student was unproductive, it could influence others:

> I think if one shuts down, then it's harder, it's easier for the others to shut down and be unproductive than for them to get the reluctant writer to write, which, I don't know, I've seen both, but in this case, I'm just thinking more of certain days where maybe they were tired, or they were not as productive. And, I think if one was tired, the other would kind of follow along in that way.

Mr. Towers also highlighted attendance as an issue, and explained that "when one person isn't there, then the onus is on [the other] to do the work alone, rather than in a collaborative way… ."

The teacher also pointed out that the writing process took longer due to the need to "wait for a face-to-face," rather than assigning it "more for homework where I just say go and write a story at home." He added, "it was more about the process so that took longer." In the focus group interview, a student also explained how the collaborative nature of the project slowed it down:

> I would say that collaborative writing is slower than one person writing it because you have to suggest to the other, 'we should do this,' and the other person might say, 'no, no, no, we should do this instead,' and you have to agree to compromise or just give in to the other person. And, it's a slower process because it's like you are pushing one way and the other person is pushing a different way, and it's slower to reach the end.

As noted, it takes considerable class time to facilitate a collaborative, face-to-face writing project, but it offers several affordances. It allows students to communicate more easily with their group members and to receive more immediate support and feedback from their teacher and peers. Moreover, during face-to-face classes, the teacher can facilitate the processes of collaborating, writing, and revising more efficiently.

Discussion and Implications for Teaching

In the focal classroom, students were assigned in pairs and one triad to write a story. The teacher integrated a procedural facilitator, Google Docs, with opportunities for face-to-face collaboration. While students were engaged in the writing process, the teacher provided ongoing feedback verbally as well as through the Google Docs application. In addition to being the "chief editor," the teacher acted as a facilitator and moderator during the collaborative writing process.

Several lessons can be gleaned from this study's findings to support future collaborative writing projects using Google Docs or other cloud-based tools. To follow is a list of key findings and recommendations for educators:

1. Even though the students were "digital natives" (Prensky, 2001) and they had experience using Google Docs, they did not know how to use all features of the tool effectively. Therefore, it is imperative that teachers are prepared to provide guided support with the tools they choose to adopt to facilitate writing instruction.
2. Students experienced difficulties bringing their diverse ideas together during the collaborative writing process. In addition to taking on a moderating role, teachers should consider how to break down relational barriers between students, especially when they are expected to work collaboratively with classmates with whom they are less familiar (Russell, 2010).
3. The findings from this study demonstrate that it is beneficial to provide opportunities for face-to-face collaboration in conjunction with the Google Docs tool. Face-to-face collaboration facilitates more immediate support and feedback from the teacher and classmates, as well as better communication between collaborators.
4. A characteristic of authentic learning activities is that they are seamlessly integrated with assessment (Reeves et al., 2002). The present study shows that cloud-based tools facilitate this process because the teacher can read and assess students' writing while it is still in progress, noting areas for growth to guide their teaching and their students' learning.
5. When giving feedback through Google Docs, the teacher suggested that it is sometimes more effective to provide comments for students to respond to, rather than suggestions for edits that can be accepted without careful consideration. This observation is supported by findings from a meta-analysis showing that comments focused on form and content resulted in stronger gains in holistic quality of writing and grammatical accuracy when compared to direct error correction (Biber et al., 2011). For collaborative projects, students should also be instructed to read through and address the teacher's feedback together. If one student resolves the teacher's comments or accepts the suggestions, the feedback disappears off the main view of the document, making it unlikely that their collaborator(s) would benefit.
6. In the focal classroom, both non-native English speakers noted that the teacher's feedback provided via Google Docs was unclear. One reason that some second language learners do not benefit from corrective feedback is that "the type of feedback given (that is, its level of explicitness) is inappropriate…" (Bitchener, 2017, p. 138). Therefore, it is recommended that teachers hold face-to-face conferences with students to discuss and clarify the feedback provided through Google Docs.

In summary, the teacher plays a critical role in supporting the success of cloud-based collaborative writing tools, such as Google Docs, as part of a face-to-face course. In the focal classroom, the teacher monitored the writing process both through Google Docs and by conversing with students during class, which allowed him to be more responsive to the needs of his students. When using digital

technologies to support writing instruction, teachers must continually evaluate their effectiveness within their contexts and adjust as necessary.

Limitations and Future Research

The findings from this study are derived from a small case study that involved a course focused on the increasing relevance of digital technologies and an experienced teacher with a keen interest in using cloud-based tools to support his pedagogy. While the findings from this research cannot be generalized, the study may support transferability, which is defined as the "degree to which the results of qualitative research can be transferred to other contexts or settings…" (Lincoln & Guba, as cited in Korstjens & Moser, 2018, p. 121). A description is provided of not only the research findings but also the methods and procedures, so that educators can assess if the findings and recommendations could be applicable to their contexts.

A notable limitation of this study is that it does not provide an analysis of the patterns of participation and interaction that developed between the collaborators. Permission was not sought to audio or video record the face-to-face writing sessions, and since much of the writing occurred while the students were sitting together during class, it was not possible to document all the interactions that were occurring through the field notes. Future research that analyzes the patterns of participation and interaction between collaborators through both the cloud-based tool and face-to-face collaboration would be a valuable addition to the existing literature. Another beneficial avenue for future study would be to examine the feedback provided by the teacher and peers through Google Docs, as well as the students' responses to the feedback and their perspectives on the feedback process; this exploration could shed lights on the opportunities and barriers that exist with the provision of peer feedback and with students' uptake of both peer and teacher feedback when using cloud-based technologies.

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Appendix A: Sample Pre-Project Teacher Interview Questions

1. Could you describe your current teaching context?
2. Do you have experience supporting learners in an online (web-based) learning environment? If so, could you briefly describe your experiences?
3. What do you see as the potential benefits of engaging students in collaborative writing in a web-based learning environment?
4. What do you see as the potential challenges of engaging students in collaborative writing in a web-based learning environment?
5. What roles do you (the teacher) adopt when using collaborative tasks in class? How might your roles be similar or different when students are collaborating online?
6. What skills do you think students will need to be able to engage effectively in a web-based collaborative writing project?
7. Why are you interested in participating in this study?

Appendix B: Sample Post-Project Student Focus Group Interview Questions

1. Could you briefly describe your experience writing stories in collaboration with your peers (using Google Docs)?
2. What were the most valuable and interesting aspects of the collaborative story writing project?
3. What challenges did you encounter while working on the collaborative story writing project? How did you respond to those challenges?
4. You had the opportunity to work on your stories while sitting with your peers in class and using your Chromebooks. What are the benefits of this learning environment? What are the challenges?
5. What are some different ways in which your teacher supported you? How did you respond to the suggestions and comments that your teacher provided? Are there any other ways in which your teacher could have supported you?
6. What are the benefits of using Google Docs for collaborative writing projects? What are the challenges of using Google Docs? What Google Docs features did you find to be the most useful during the story writing process?

Appendix C: Sample Post-Project Teacher Interview Questions

1. What are your reflections on the collaborative story writing unit as a whole? What opportunities and challenges arose during the collaborative writing process?
2. What insights did you glean about your students' writing behaviours as you observed the collaborative writing process through the Google Docs? How did these insights inform your pedagogical decisions and actions?
3. How did your students respond to the suggestions and comments you provided on their stories? How did the students respond to the suggestions and comments provided by their peers?
4. You provided opportunities for your students to work on their stories while sitting face-to-face with their peers. What are your observations on this learning environment?
5. What were the benefits of using Google Docs for collaborative writing projects? What were the challenges of using Google Docs for collaborative writing projects? What Google Docs features were the most useful? How is the advent of web-based tools changing the way you teach writing?
6. If you were going to do another collaborative story writing project in the future, what would you keep the same? What would you do differently?

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Exploring Students' Perception of Quizizz as a Learning Media in Higher Education

Explorer la perception des élèves de Quizizz en tant que média d'apprentissage dans l'enseignement supérieur

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Abstract

The use of game in education has been evidenced to improve students' engagement in learning. However, much research shows that the use of game in learning is only effective for high school students, while its use for students of higher education is limited. Research on game in education has predominantly been occupied by Kahoot! while Quizizz has received less analysis. This research aims to explore student perception of Quizizz as a learning media and the related obstacles experienced in a library science study program of State Islamic University of North Sumatera in Indonesia. The research uses a combination of quantitative and qualitative methods, such as survey and focused group discussion, with a sample of 272 undergraduate students. The study found that the use of games in learning actively increased student engagement and led to a significant improvement in independence and self-control in learning. During the learning activity students maintain that they gain their self-confidence while enjoying the game. The research suggests that to increase learning achievement, educators should use various teaching strategies that encourage students' active mental and physical engagement. Additionally, it is expected that this learning experience and content will enhance students' retentive memory.

Keywords: educational technology; game-based learning; gamification; library and information science; Quizizz

Résumé

L'utilisation du jeu dans l'éducation a été mise en évidence pour améliorer l'engagement des élèves dans l'apprentissage. Cependant, de nombreuses recherches montrent que l'utilisation du jeu dans l'apprentissage n'est efficace que pour les élèves du secondaire, tandis que son utilisation pour les étudiants d'enseignement supérieur est très limitée. Les recherches sur le jeu dans l'éducation ont

été principalement occupées par Kahoot! Alors que Quizizz a moins d'analyses. Cette recherche exploratoire vise à explorer la perception des étudiants de Quizizz en tant que média d'apprentissage et les obstacles connexes vécues dans le programme d'étude de la science des bibliothèques d'une université islamique d'État en Indonésie. La recherche utilise une combinaison de méthodes quantitatives et qualitatives, telles que l'enquête et la discussion de groupe ciblée, avec un échantillon de 204 étudiants. L'étude a révélé que l'utilisation de jeux dans l'apprentissage augmentait activement l'engagement des élèves et a conduit à une amélioration significative de l'indépendance et de la maîtrise de soi dans l'apprentissage, ce qui a amélioré la réalisation des objectifs d'apprentissage. Pendant l'activité d'apprentissage, les élèves soutiennent qu'ils acquièrent leur confiance en soi tout en profitant du jeu. La recherche suggère que pour augmenter les résultats de l'apprentissage, les éducateurs devraient utiliser diverses stratégies d'enseignement qui encouragent l'engagement mental et physique actif des élèves. En outre, il est prévu que cette expérience d'apprentissage et cette contenu améliorent la mémoire rétendue des élèves.

Mots-clés: apprentissage basé sur le jeu ; bibliothèque et science de l'information ; gamification ; Quizizz ; technologie éducative

Introduction

Learning is a multifaceted process that encompasses cognitive, attitudinal, and psychomotor aspects, involving intentional, active engagement in reciprocal activities of intention-action-reflection to achieve understanding and behavioural changes (Anderson, Krathwohl, & Bloom, 2001; Bloom, 1956; Glover, 2013; Sataloff et al., 2000). Furthermore, it is an intentional process to achieve both understanding and behavioural change goals. To improve student motivation in learning and maintain the sustainability of academic activities, educators need to use various strategies and media that encourage both mental and physical engagement, such as games (Bond et al., 2020; Mak et al., 2021; Whiter, 2020).

Previous research has consistently shown that the use of games in learning environments substantially enhances the achievement of learning objectives, with studies across various fields highlighting its effectiveness (Glover, 2013; Jääskä et al., 2022; Lin, 2022; Yang & Chen, 2021). This body of work suggests that the implementation of games in educational settings should not merely be for entertainment but must constitute a sequence of meaningful activities that support educational objectives (Nachimuthu & Vijayakumari, 2011). Building on these insights and the foundational work of prominent researchers such as Ortega et al. (2022) in history education, Moon & Ke (2019) in the domain of mathematics, Basuki and Hidayati (2019) in English language learning, Candel et.al. (2021) in music learning, and Tavares (2022) in nursing, this study aims to delve deeper into the nuanced impact of game-based learning strategies. By investigating the efficacy of these strategies within a Library Science Program, this research not only aims to validate the versatility and potential of game-based approaches across varying disciplines but also seeks to enrich the current academic discourse on educational games. Through this investigation, we aspire to contribute to a more comprehensive understanding of how game-based learning can be optimally designed and implemented to achieve desired educational outcomes, thereby offering meaningful activities that align with learning objectives.

The games intended to encourage learning in students should include focused activities, reward mechanisms, and progress tracking of the learning process (Glover, 2013). According to Nachimuthu and Vijayakumari (2011), to truly be effective, learning games must also incorporate elements that are enjoyable and intrinsically motivating for students. This approach is underpinned by the crucial role of engagement in the educational process. Engagement is a pivotal component in education for several reasons, as outlined by recent research. It is directly linked to increased student achievement, boosting satisfaction, aiding in retention strategies and learning outcomes, particularly notable in higher education settings (Candel et al., 2021; Delialioğlu, 2012; Gao et al., 2018; Hamari et al., 2016; Wang & Degol, 2014; Webber et al., 2013).

In this era of rapid information technology development, diverse technology-based games, including Kahoot, Popplet, Padlet, Quizizz, Google Street View, Screencast-O-Matic, and Adobe Spark, have risen in popularity for enhancing student engagement in learning (Trust, 2017). A comparative study of the effectiveness of Kahoot! and Quizizz on academic achievement found both platforms to be equally effective, demonstrating no significant difference in enhancing learning outcomes (Janković & Lambić, 2022), but students prefer Quizizz over Kahoot! (Basuki & Hidayati, 2019). This finding supports the premise that when educational games are thoughtfully designed with engaging elements, they can significantly impact learning, regardless of the specific platform used (El-Masri & Tarhini, 2015; Gao et al., 2018).

Given the critical role of student engagement in academic achievement, satisfaction, and retention, alongside the necessity for a nuanced and comprehensive approach to engagement research, the use of gamified learning tools becomes increasingly important. As such, our evolving exploration into the effectiveness of technology-based games in education serves not only to expand upon the existing body of work but also to underscore the compelling need for game-based learning strategies that are intricately designed to enhance engagement across diverse student demographics and learning environments.

Gamification as an approach to the learning process is based on the social learning theory developed by Bandura (1977) and Vygotsky (1977). According to Bandura, an individual's learning behaviour is influenced by encouragement from the social environment, referred to as incentives. These incentives are indicated by an individual’s interest and motivation in the learning process (Bandura, 1977, p. 101). Bandura posited that learning occurs within a social context and is significantly influenced by observation, imitation, and modeling. This framework suggests that social incentives and intrinsic motivations play a crucial role in shaping an individual's learning behaviour (Bandura, 1977). Gamification leverages these principles by incorporating elements like leaderboards, badges, and points—external incentives that mirror the social reinforcements Bandura describes. These elements not only motivate learners but also foster a sense of community and belonging, reinforcing learning through social engagement and recognition.

Meanwhile, Vygotsky (1997, p. xxii) stated that the educational process should be based on individual activities and teaching guides to monitor these activities. Vygotsky emphasized that the best way to understand the mind is by looking at how it changes, and the highest mental functions come from social activities which are mediated by tools and symbols. Moreover, the role of the educator is to create a supportive social environment for learning (Hausfather, 1996). Vygotsky emphasized the importance of social interaction and cultural tools in the development of cognitive

abilities. He argued that learning is a socially mediated process and that the educational environment should facilitate individual activities within a cooperative framework, guided by more knowledgeable others (1997). This perspective underlines the significance of creating learning environments that are responsive to individual needs while enabling social collaboration through shared activities. Gamification in education can be viewed as a direct application of Vygotsky's theory, providing a structured yet flexible framework where individual efforts are acknowledged within a collective context, and learning is mediated by digital tools and symbols that facilitate educational objectives.

In gamification-based learning, there are several components and features, such as scores, badges, rankings, and trophies, that allow for immediate and real-time feedback (Hassan et al., 2021). These features are incentives created to stimulate student motivation to participate in a learning environment that makes them feel happy and compete with peers. Before presenting the game, educators should determine the objectives and expected achievement by playing the game first. According to Paľová & Vejačka (2022), one principle in game-based learning is that failure in playing is not tantamount to negative consequences of learning achievement, but only defeat. Gamification approaches in the learning process provide opportunities for students to act independently, demonstrate competence, and learn to work with others (Giang, 2013; Glover, 2013; Guthrie, 2014). Games can enhance immersive, flexible, tiered, diverse, and interactive learning experiences that increase student motivation and active engagement as well as support collaboration and real-world experiences (Díaz, 2020; Moon & Ke, 2019).

Quizizz is one of the effective and widely used technology-based learning media by educators in various subjects. Its use stirs student curiosity, enhances creativity, and supports learning with peers. This is in line with Black and Allen's (2018) suggestion that learning is a social activity. The use of Quizizz in learning creates a sense of enjoyment for students and increases focus on the learning content. The ease of learning, enjoyment, and meaningful knowledge has a positive impact on learning attitudes (Lin, 2022).

Research on the utilization of games in educational contexts has predominantly focused on primary and secondary education levels, leaving a noticeable void in understanding their impact and implementation at the tertiary or higher-education level. The scarcity of gamification in higher education is a notable issue (Montenegro-Rueda et al., 2023; O'Connor & Cardona, 2019). This gap is particularly pronounced when it comes to investigating students' perceptions of games as viable learning media within these more advanced educational settings. Our research endeavors to bridge this gap by exploring the application of games, specifically through the use of Quizizz in higher education. By concentrating on Quizizz as a learning media, this study aims to delve into students' perceptions and evaluate how games can influence learning motivation, engagement, and the overall effectiveness of the learning process. The body of academic work dedicated to examining Quizizz as a learning medium remains scant and needs further exploration (Muji et al., 2021; Pratama, 2021), underscoring the novelty and significance of our investigation in this area. Therefore, the present study aims to answer the following questions: What is students' perception of Quizizz as a learning media? What are the obstacles experienced by students when learning to use Quizizz?

Method

Participants and Context

This research was conducted within the Library and Information Science study program, Faculty of Social Sciences, Universitas Islam Negeri Sumatera Utara, Indonesia, in December 2022. Quizizz as a learning media was given to several classes, which include Learning Theory, Media and Curriculum, Digital Library, and Library Management classes.

The study included university students enrolled in four distinct courses, spread across eight classes in the third, fifth, and seventh semesters of 2022 (Table 1).

Table 1

Characteristic of Study Participants

Class	Courses	Semester	Number of students		Total number of students
			Male	Female	
1	Learning theory, media and curriculum	7	4	34	38
2	Learning theory, media and curriculum	7	14	39	53
3	Digital library	5	9	21	30
4	Digital library	5	9	30	39
5	Digital library	5	6	24	30
6	Library management	3	5	21	26
7	Library management	3	6	21	27
8	Library management	3	6	23	29
Total number of students			59	213	272

For most students, this was their first exposure to Quizizz. This research aims to explore students' perception of Quizizz as a learning media and the related obstacles experienced in a library science study program at the Universitas Islam Negeri Sumatera Utara in Indonesia. By focusing on student experiences and feedback, the study intends to assess the effectiveness of Quizizz in enhancing learning outcomes and to identify the specific challenges students face while adapting to this digital tool. Insights gained could offer valuable guidance on integrating technological aids more effectively within educational frameworks, especially tailored to the needs of the library science curriculum at this university.

Data Collection and Instruments

Observations were conducted in classrooms to gather real-time data on participant behaviour and interactions with Quizizz. An observational checklist was used to ensure consistent data collection, focusing on student expressions and activities while using Quizizz. Observations took place over 90 minutes, capturing both the initiation and progression of students' behaviour while answering the questions on Quizizz, thus yielding insights into tool engagement. These sessions were video-recorded with participants' consent for later analysis.

To gain a deeper understanding of participant experiences and perspectives, focus group discussions were employed as one methodological approach in our research. These discussions involved a total of 24 undergraduate students, evenly distributed across 8 classes, ensuring a diverse representation by selecting 3 students at random from each class within the broader study cohort. Utilizing a semi-structured discussion format enabled us to thoroughly explore students' experiences with Quizizz as a learning tool. This format facilitated an open environment where participants could freely share their thoughts and emotions regarding their engagement with Quizizz, thereby enriching the observational data with qualitative nuances.

Furthermore, to corroborate observations and discussions with tangible evidence of student behaviour, the use of Quizizz in class was documented using a smartphone device. This recording served as a pivotal tool, validating the insights gathered through both observations and focus group discussions. Finally, data accrued from surveys underwent tabulation and detailed analysis, forming a comprehensive overview of our findings. This multifaceted approach—integrating focus group discussions, observational recordings, and survey analysis—offered a holistic perspective on the educational impact of Quizizz, illuminating both its benefits and the challenges perceived by students.

The quantitative approach was used to collect data on students' perceptions, and the data was collected using a questionnaire with the help of Google Forms. Furthermore, the data collection instrument applied a four-point Likert scale where each question was given a weight of 1 to 4 points. Point 1 represents disagree, 2 for slightly disagree, 3 for agree, and 4 for strongly agree with the statement. The questionnaire was developed to explore data on students' experiences when using Quizizz, the feelings experienced, and views on Quizizz as a learning media. Additionally, the instruments were developed based on the framework of EGAMEDU, developed by Gonzalez et al. (2022).

Gonzalez et al. (2022) proved the validity of EGAMEDU as a tool for measuring learning experiences using games. This tool was developed based on Bandura's Social Learning theory (1977) which consists of components of fun, attention, creative thinking, active, no negative effects, control, socialization, and learning. The fun component (questions 1-2) was used to measure student interest in using Quizizz. Attention (questions 3-4) measured the level of attention given by students in learning using Quizizz. Creative thinking (questions 5-6) measured the level of imagination, creativity, or effort made by students when using Quizizz. Activeness (questions 7-8) ascertained the emotional involvement of students and the nervousness experienced. Meanwhile, the absence of negative effects (questions 9-11) highlighted the level of frustration, difficulty, or pressure when using Quizizz. Control (questions 12-13) measured the level of student independence and self-confidence developed when running the game. Socialization (questions 14-15) determined the level

of cooperation between students and their interaction with peers. Finally, learning (questions 16-17) observed students' experience when learning something new.

The number of instruments totaled 17 question items, which were analyzed using the JASP application version 0.16.4 to determine the validity of each question. This open-source application was also used to measure students' perceptions based on the EGAMEDU category.

The research sample group totaled 272 undergraduate students in the Library and Information Science program, separated into eight classes in three different course types. However, only 204 students filled out the questionnaire, of which 171 (83.8%) were female and 33 (16.2%) male. The majority of participants were between the ages of 18 - 23 years. Table 2 shows the number of research participants by course in the program.

Table 2

Number of Research Subjects (n=204)

Courses	Students	%
Learning theory, media, and curriculum	67	33%
Library management	64	31%
Digital library	73	36%

Quizizz

Quizizz (https://quizizz.com/) is a web-based application designed for learning and learning assessment. This application was used as a media to test understanding of the learning material in the form of multiple-choice questions. The Quizizz questions were written in Indonesian on the subjects of learning theory, media, and curriculum, digital libraries, and library management. The educator instructed the students to answer the 17 questions using their smartphones. The educator displayed Quizizz on a large projector screen to show the quiz code used by the students to join. Finally, when the students were logged into the application with their devices and ready, the educator started the quiz.

During the quiz, each question was allotted a brief 30-second duration for students to respond, with each correct answer carrying a weight of one point. As students interacted with the quiz, the system dynamically projected a live rank order showcasing those who answered correctly and their corresponding scores. Following the quiz's conclusion, the system promptly displayed the scores and ranking order achieved by students, highlighting the top performers at the pinnacle of the leaderboard. Additionally, Quizizz provides educators the valuable functionality to review and download student learning achievement reports in Excel format, facilitating comprehensive assessment and analysis of individual and collective progress.

Results

Students' Perceptions of Quizizz as a Learning Media

To explore data about students' perceptions of Quizizz as a learning media, a Google Forms questionnaire was used. The scope of the data collected is shown in Table 3.

Table 3

List of Questions in the Questionnaire on Students' Perceptions of Quizizz

Question		Aspects measured
1.	I feel happy when using Quizizz in learning	Fun
2.	I think Quizizz increases my learning motivation	
3.	I think Quizizz makes learning more interesting	Attention
4.	By using Quizizz I am more focused on the content of the learning material	
5.	The use of Quizizz makes me more concentrated on learning	Creative thinking
6.	I think Quizizz makes me think more creatively	
7.	I feel actively involved when using Quizizz	Activation
8.	I don't feel nervous when using Quizizz	
9.	I don't feel bored in learning when I use Quizizz	Absence of negative effect
10.	I don't find it difficult to understand Quizizz	
11.	I don't feel pressured (stressed) in using Quizizz	
12.	I can do the questions in Quizizz independently	Control
13.	I can operate Quizizz without the help of friends	
14.	I have confidence that I can use Quizizz	Socialization
15.	Quizizz allows me to cooperate with friends	
16.	I feel that I can learn better using Quizizz	Learning
17.	Based on my experience, learning using Quizizz makes me remember the subject matter longer	

Table 3 encapsulates the various aspects measured in the study about students' perceptions of using Quizizz as a learning tool. It categorizes student responses into distinct domains, such as Fun, Attention, Creative Thinking, Activation, Absence of Negative Effect, Control, Socialization, and Learning as per Bandura (1977). Each aspect is explored through specific questions, aimed at uncovering nuanced insights into how Quizizz impacts student engagement, involvement, emotional responses, self-efficacy, social interactions, and overall learning effectiveness. The questions range from evaluating emotional responses and engagement to assessing the platform's role in fostering independence, creativity, and collaborative opportunities among learners.

Quantitative Result

To present a concise description of the data sample in quantitative terms, Table 4 shows the descriptive statistics outlining the mean and standard deviation distribution values of each instrument as well as the data distribution for the students' perception instrument of Quizizz. The distribution shows the total minimum value is 17.0 and the total maximum is 68.0, with a total average of 57.333 and a total standard deviation of 8.155.

Table 4

Descriptive Statistics, Mean, and Standard Deviation of Instruments

	Valid	Mean	Std. Deviation	Minimum	Maximum
Q1	204	3.593	0.549	1.000	4.000
Q2	204	3.500	0.616	1.000	4.000
Q3	204	3.681	0.588	1.000	4.000
Q4	204	3.412	0.727	1.000	4.000
Q5	204	3.319	0.737	1.000	4.000
Q6	204	3.505	0.639	1.000	4.000
Q7	204	3.510	0.624	1.000	4.000
Q8	204	2.926	0.865	1.000	4.000
Q9	204	3.461	0.668	1.000	4.000
Q10	204	3.240	0.804	1.000	4.000
Q11	204	3.201	0.833	1.000	4.000
Q12	204	3.627	0.524	1.000	4.000
Q13	204	3.426	0.680	1.000	4.000

	Valid	Mean	Std. Deviation	Minimum	Maximum
Q14	204	3.377	0.643	1.000	4.000
Q15	204	2.784	1.004	1.000	4.000
Q16	204	3.417	0.649	1.000	4.000
Q17	204	3.377	0.695	1.000	4.000
TOTAL	204	57.333	8.155	17.000	68.000

The data collection instrument was further measured for validity using Cronbach's alpha (Cronbach α) which yielded a value of 0.927, as shown in Table 5. The recommended value of Cronbach's alpha was > 0.7, signifying that the instrument is reliable. Furthermore, Table 6 shows the reliability test results per item of the instrument, indicating that each instrument has a value of ≥ 0.4. Therefore, all instruments were concluded to be reliable.

Table 5

Frequentist Scale Reliability Statistics

Estimate	Cronbach's α
Point estimate	0.927
95% CI lower bound	0.912
95% CI upper bound	0.941

Table 6

Frequentist Individual Item Reliability Statistics

	If Item Dropped	
Item	Cronbach's α	Item-rest Correlation
Q1	0.928	0.696
Q2	0.927	0.727
Q3	0.928	0.661
Q4	0.926	0.740
Q5	0.926	0.733

Item	If Item Dropped	
	Cronbach's α	Item-rest Correlation
Q6	0.927	0.727
Q7	0.928	0.658
Q8	0.931	0.561
Q9	0.926	0.731
Q10	0.927	0.713
Q11	0.929	0.628
Q12	0.931	0.547
Q13	0.932	0.484
Q14	0.927	0.687
Q15	0.934	0.438
Q16	0.926	0.755
Q17	0.928	0.659

Based on Table 6, this research instrument is valid as a data collection tool on students' perceptions of Quizizz as a learning media. Additionally, the results of the data collection survey through Google Forms highlighted students' responses on the perceptions of Quizizz (Table 7).

Table 7

Students' Responses About Quizizz (n = 204)

Dimension	Instrument/Weight	Strongly Disagree	Disagree	Agree	Strongly Agree
Fun	I feel happy when using Quizizz in learning	0%	2%	37%	62%
	I think Quizizz increases my motivation in learning	1%	3%	40%	56%
Attention	I think Quizizz makes learning more interesting	1%	3%	22%	74%

Dimension	Instrument/Weight	Strongly Disagree	Disagree	Agree	Strongly Agree
	By using Quizizz I am more focused on the content of the learning material	3%	7%	37%	53%
Creative thinking	The use of Quizizz makes me more concentrated on learning	2%	10%	42%	46%
	I think Quizizz makes me think more creatively	1%	5%	37%	58%
Activation	I feel actively involved when using Quizizz	1%	5%	37%	57%
	I don't feel nervous when using Quizizz	5%	27%	40%	29%
Absence of negative effect	I don't feel bored in learning when using Quizizz	2%	5%	39%	54%
	I don't find it difficult to understand Quizizz	3%	16%	37%	45%
	I don't feel pressured (stressed) in using Quizizz	4%	15%	39%	43%
Control	I can answer the questions in Quizizz independently	1%	1%	35%	65%
	I can operate Quizizz without the help of friends	1%	8%	39%	53%
Socialization	I have confidence that I can use the functions in Quizizz	1%	7%	46%	46%
	Quizizz allows me to cooperate with friends	12%	27%	32%	29%
Learning	I feel that I can learn better using Quizizz	0%	7%	42%	50%
	Based on my experience, Quizizz learning makes me remember materials using lessons longer	2%	6%	44%	48%

Table 7 provides a comprehensive overview of student responses regarding their experience and perceptions of using Quizizz as a learning platform. This data collected from a sample size of 204 students can be elaborated as follows:

A significant majority of students reported positive feelings towards using Quizizz, with 62% strongly agreeing that it made them happy and 56% strongly agreeing that it increased their motivation in learning. This suggests that Quizizz is perceived as an enjoyable and motivating educational tool.

The platform also scored highly on making learning more interesting (74% strongly agree) and helping students focus on learning materials better (53% strongly agree), indicating its effectiveness in capturing and sustaining student attention.

Responses indicate that Quizizz fosters creative thinking, with 46% strongly agreeing that it enhances concentration and 58% strongly agreeing that it stimulates more creative thought processes.

Most students feel actively involved when using Quizizz (57% strongly agree), though a notable percentage expressed feelings of nervousness (27% disagree), suggesting an area for further exploration to enhance user experience.

Students generally did not associate negative effects with using Quizizz. Students disagreed with feeling bored (54% strongly agree), finding it difficult to understand (45% strongly agree), or feeling pressured (43% strongly agree) when using the platform.

High levels of independence were reported, with 65% able to answer questions independently and 53% able to operate Quizizz without assistance, reinforcing the platform's user-friendliness and support for autonomous learning.

The responses were mixed in the socialization dimension. While confidence in using Quizizz was high (46% strongly agree), only 29% strongly agreed that it facilitates cooperation with friends, suggesting potential for improvement in promoting collaborative learning experiences.

On the learning dimension, 50% of students strongly feel they can learn better using Quizizz, and 48% strongly agree that it aids in remembering material longer, indicating its positive impact on learning outcomes.

The data suggest that Quizizz is perceived very positively by many students across multiple dimensions important to effective learning. It highlights the platform's capability to engage students, enhance concentration and creative thinking, and promote active learning with minimal negative effects. However, there are opportunities to further explore and address aspects related to nervousness, socialization, and cooperation to maximize Quizizz's educational potential.

Qualitative Result

Based on observations of the use of Quizizz in the classroom, students showed an enthusiastic attitude toward learning. This research shows that the utilization of Quizizz in learning is a new experience for most students. Students expressed happy behaviour seeing the results of the respective scores. Some students even requested that the Quizizz media be repeated at the next face-to-face meeting.

Obstacles Experienced by Students When Learning to Use Quizizz

The qualitative questions designed for the focus group discussions aimed to explore various dimensions of student experience with Quizizz, including but not limited to usability, engagement, motivational aspects, and any challenges encountered. Specifically, questions such as "What challenges do you face while using Quizizz in a classroom setting?" and "Can you describe any technical issues encountered during Quizizz sessions, including details about the nature of these issues?" were posed to elicit rich, detailed responses about the hurdles faced by students, particularly focusing on their experiences with network connectivity.

Following the collection of qualitative data from these discussions, a thematic analysis approach to identify, analyze, and report patterns (themes) within the data was deployed. This involved a detailed reading of the transcripts to become familiar with the depth and breadth of the content, followed by the generation of initial codes that represented ideas relevant to the research questions. Through a collaborative team effort, these codes were then grouped into potential themes, iteratively refined, and finally defined and named. This process allowed for significant insights about technological barriers, such as network issues, as reported by the students during focus group discussions.

Students generally expressed positive sentiments about using Quizizz, noting its enjoyable and engaging nature. A common obstacle highlighted by many students was the issue of network connectivity. Despite these challenges, most students felt that their learning experience was not significantly hampered. However, a few expressed that network issues did cause momentary frustration and anxiety, particularly when they were eager to participate. In terms of solutions, students with data packages on their smartphones seemed less affected by the Wi-Fi issues. Overall, there was a consensus that Quizizz positively impacts learning, with technical issues being seen as minor obstacles. When asked about their preference, students who owned smartphones with data packages expressed a tendency to rely on their personal data for a more stable connection. As for suggestions, students hoped for better campus Wi-Fi but also appreciated the flexibility Quizizz offered for use with different types of Internet access.

From the quantitative data analysis several key themes emerged reflecting students' positive perceptions of Quizizz as described in Table 8.

Table 8

Themes and Codes of Students' Perception on Using Quizizz

Themes	Codes	Evidence
Positive emotions and motivation	Happy, increased motivation, enjoyable	A significant majority of students reported positive feelings towards using Quizizz, with 62% strongly agreeing that it made them happy and 56% strongly agreeing that it increased their motivation in learning

Themes	Codes	Evidence
Engagement and attention	Interesting, better focus, sustaining attention	The platform scored highly on making learning more interesting (74% strongly agree) and helping students focus on learning materials better (53% strongly agree), indicating its effectiveness in capturing and sustaining student attention
Cognitive enhancement	Creative thinking, concentration, stimulating thought processes	Responses indicate that Quizizz fosters creative thinking, with 46% strongly agreeing that it enhances concentration and 58% strongly agreeing that it stimulates more creative thought processes
Active involvement and independence	Active involvement, nervousness, independence, user-friendliness, autonomous learning	The majority of students feel actively involved when using Quizizz (57% strongly agree), though a notable percentage expressed feelings of nervousness (27% disagree), suggesting an area for further exploration to enhance user experience High levels of independence were reported, with 65% able to answer questions independently and 53% able to operate Quizizz without assistance, reinforcing the platform's user-friendliness and support for autonomous learning
Minimal negative effects	Not boring, easy to understand, no pressure	Students did not associate negative effects with using Quizizz. Most students disagreed with feeling bored (54% strongly agree), finding it difficult to understand (45% strongly agree), or feeling pressured (43% strongly agree) when using the platform
Socialization and collaboration	Cooperation with friends, collaborative learning experiences	The responses were mixed in the socialization dimension. While confidence in using Quizizz was high (46% strongly agree), only 29% strongly agreed that it facilitates cooperation with friends, suggesting potential for improvement in promoting collaborative learning experiences
Learning outcomes	Better learning, remembering material longer, positive impact on learning outcomes	On the learning dimension, 50% of students strongly feel they can learn better using Quizizz, and 48% strongly agree that it aids in remembering material longer, indicating its positive impact on learning outcomes

The qualitative data from focus group discussions revealed additional nuances and challenges faced by students. Thematic analysis of these transcripts uncovered the themes related to obstacles described in Table 9.

Table 9

Obstacles Experienced by Students

Themes		Codes	Evidence
1	Network connectivity issues	Wi-Fi problems, Internet access, data packages on smartphones	A common obstacle highlighted by many students was the issue of network connectivity
2	Emotional impact of obstacles	Frustration, anxiety	A few students expressed that network issues did cause momentary frustration and anxiety, particularly when they were eager to participate
3	Solutions and preferences	Personal data usage, better campus Wi-Fi, flexibility of Internet access	Students with data packages on their smartphones seemed less affected by the Wi-Fi issues

Discussion

The findings underscore a general positive perception among students towards Quizizz as an educational tool, reinforcing the game-based learning paradigm's potential to enhance student engagement and learning outcomes through fun and competitive elements. This alignment with the neurofunctional response process to pleasure and joy in learning, as identified by Greipl et al. (2021), signifies the neurocognitive benefits of gamification in educational settings. The elevation of neural responses connected to emotion and reward, as observed, further corroborates the effectiveness of gamified learning in activating critical cognitive abilities outlined in Bloom's taxonomy (Anderson, Krathwohl, Airasian, et al., 2001), spanning basic recall to creative application.

Recent literature, such as Zainuddin et al. (2020) and Foroutan Far & Taghizadeh (2022), highlights the innovative and engaging nature of gamified learning tools like Quizizz. Their reports suggest that these tools not only trigger competitive and creative learning processes but also foster independence and self-regulation among students. This study adds to the narrative by demonstrating how Quizizz can be a promising platform, echoing the call for incorporating competitive and challenging elements in learning. However, infrastructural barriers such as inadequate Internet access is identified, aligning with the concerns raised by Olateju (2019) and Yusuf (2020), which can significantly impede the efficacy of such digital learning tools. This insight extends the discourse on the necessity of robust technological support for the effective implementation of gamified learning solutions.

Quantitative data, primarily derived from the use of surveys and questionnaires, provides a solid baseline for understanding the overall students' perception and efficacy of Quizizz as a learning medium. When comparing these data points with the current educational framework by Olateju (2019) and Yusuf (2020), particularly the emphasis on personalized and engaged learning environments, results resonate with the growing body of research advocating for adaptive learning technologies. For instance, the positive perceptions highlighted in the quantitative analysis align with the principles of motivational theory in education, which suggests that student engagement increases with interactive and responsive learning tools (Robinson et al., 2006; Ullah & Anwar, 2020). These findings underscore the potential of gamified learning environments, like Quizizz, to cater to diverse learning needs and preferences, echoing the call for more personalized educational strategies within modern pedagogical models.

Qualitative insights gained from focus group discussions reveal intricate details about students' experiences, challenges, and the contextual factors influencing their perceptions of Quizizz. This rich narrative complements the quantitative outcomes by providing depth to the observed positive trends, revealing nuances such as the motivational boost from gamification elements and specific pedagogical advantages like instant feedback. These firsthand accounts are invaluable for understanding the complex interplay between student engagement, learning technology, and educational outcomes. The embodied cognition theory, which posits that cognitive processes are deeply rooted in the body's interactions with its environment (Lynott et al., 2013; Pecher & Zwaan, 2005; Rowlands, 1999; Ziemke, 2016), offers a theoretical lens to interpret our qualitative findings. The tactile and interactive nature of Quizizz, as described by participants, can be seen as facilitating a more immersive and embodied learning experience, fitting into the current shift towards experiential and holistic educational practices.

The observational data, documenting student behaviour and interaction with Quizizz in real-time, provides concrete evidence of engagement and active learning. Observing students' non-verbal cues and their navigation through the game offer additional layers of understanding, indicating the degree of ease, motivation, and cognitive engagement experienced by students. This approach aligns with the socio-constructivist learning theory, which values collaboration, social interaction, and the construction of knowledge through active participation (Vygotsky, 1997). The observational insights highlight how gamified learning tools like Quizizz can foster a collaborative and interactive learning atmosphere (Rughinis, 2013; Wahyuni et al., 2023; Yunus & Hua, 2021), echoing the educational framework's emphasis on collaborative learning environments and technology's role in facilitating these interactions.

By situating this study within these current educational paradigms, it's evident that gamified learning tools like Quizizz not only align with but actively support the evolving goals of educational frameworks (Katanosaka et al., 2021; Wahyuni et al., 2023; Yunus & Hua, 2021), including the facilitation of engaged, personalized, and experiential learning experiences. These insights reinforce the significance of incorporating diverse methodological approaches to fully capture and understand the implications of innovative educational technologies. While this research highlights the potential benefits of using game-based electronic learning media to enhance student engagement and learning outcomes, it is recognized that this approach may not be equally effective or accessible for all students. Educators adopting such tools should consider the diverse needs of their learners, including

those who may require accommodations, have different learning styles, or face technological limitations. Tailoring the use of gamified learning environments to suit individual learner profiles and ensuring equitable access to the necessary technological resources are critical steps in maximizing the educational benefits of these tools.

The EGAMEDU instrument, validated by Gonzalez et al. (2022), serves as a comprehensive framework for evaluating the educational impact of game-based learning environments. Our application of this instrument to Quizizz and the findings generated therein invite further scrutiny within the context of current education literature. Given the distinct characteristics and pedagogical approaches inherent to each game-based learning tool, as well as the unique demographics and learning styles of various student cohorts, the generalizability of the EGAMEDU instrument across all settings may be constrained. Therefore, caution should be exercised when interpreting the results obtained through this instrument in the context of Quizizz. These findings should be considered preliminary and specific to the conditions under which this study was conducted. Further research is warranted to adapt and validate the EGAMEDU instrument or develop new assessment tools tailored to different game-based learning platforms and target populations, ensuring a more accurate and context-sensitive evaluation of their educational value.

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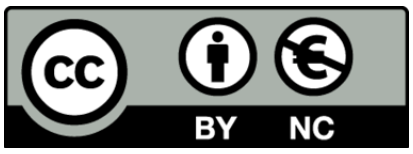

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Digital Wellness Framework for Online Learning

Cadre pédagogique pour le bien-être numérique de l'apprentissage en ligne

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Abstract

The ever-changing digital context, digital habits and pressures, demands and practices, often contribute to online learners experiencing burnout, stress, fatigue, sleep deprivation, cognitive overwhelm, and work-life imbalance, just to mention a few issues identified in literature. With the rise of online learning offerings, an increasing number of educators across diverse contexts and disciplines are faced with questions pertaining to the optimal experience and design for online learning. Current research has highlighted both positive and negative impacts of teaching and learning in the digital space. This online learning design debate has identified a need for practices that contribute to the holistic wellbeing of learners rather than merely cognitive outcomes. There is a need for an evidence-based pedagogical framework centred on wellbeing that enables the creation of learning "by design". This research, applying secondary data analysis and a mindfulness-informed lens, results in such a framework, i.e., the DW-FOLD: Digital Wellness Framework for Online Learning – to guide intentional use of technology and online learning pedagogical principles that ensure active and meaningful learning while using technology for the good of all learners.

Keywords: digital wellbeing; digital wellness; framework; instructional design; online learning design

Résumé

Le fait que le monde numérique en constante évolution crée des habitudes, exerce de la pression et impose des exigences et des pratiques a pour effet de contribuer à ce que les apprenants en ligne souffrent, dans bien des cas, d'épuisement professionnel, de stress, de fatigue, de surcharge cognitive, ou alors que cela perturbe leur équilibre travail-vie personnelle ou leur sommeil, pour ne mentionner que quelques problèmes recensés dans la littérature. Avec l'essor des offres d'apprentissage en ligne, un nombre croissant d'éducateurs issus de différents milieux et disciplines sont confrontés à des questions

relatives à l'expérience de l'apprentissage en ligne et à la façon de la concevoir. Les recherches actuelles ont mis en lumière les effets positifs et négatifs de l'enseignement et de l'apprentissage dans la sphère numérique. Ce débat sur la conception de l'apprentissage en ligne a permis de comprendre que les apprenants avaient besoin de pratiques qui contribueraient davantage à leur bien-être global plutôt que de simples améliorations sur le plan cognitif. Il est nécessaire de mettre en place un cadre pédagogique fondé sur des données probantes et axé sur le bien-être qui permet la création d'un apprentissage « par conception ». Cette étude qui s'appuie sur une analyse de données secondaires et sur une approche de la pleine conscience a abouti à un tel cadre, c'est-à-dire le cadre pédagogique pour le bien-être numérique de l'apprentissage en ligne (DW-FOLD : Digital Wellness Framework for Online Learning), dont la visée est d'orienter l'utilisation de la technologie et le recours à des principes pédagogiques en ligne qui garantissent un apprentissage actif et significatif par le biais de la technologie, et ce pour le bien de tous les apprenants.

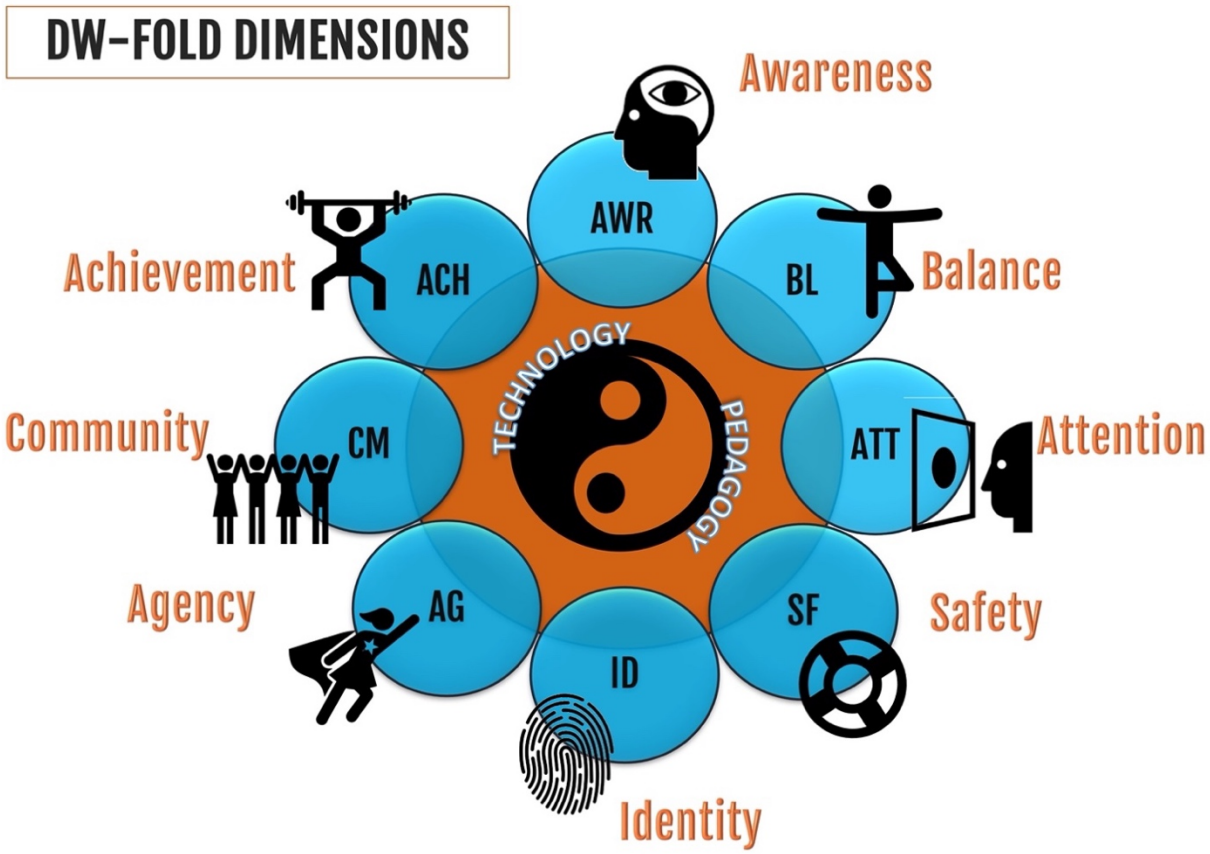
Mots-clés : bien-être numérique; mieux-être numérique; cadre; conception pédagogique; conception de l'apprentissage en ligne

Introduction

This article presents the Digital Wellness Framework for Online Learning Design (DW-FOLD). As an evidence-based practice-oriented framework, DW-FOLD aims to guide instructional designers in reframing online learning curriculum, both in content and delivery to promote the holistic wellbeing of higher education (HE) digital learners which in turn promotes successful learning outcomes. The DW-FOLD has evolved out of three consecutive qualitative studies completed between 2018 and 2020 in graduate courses at a Canadian online university (Palalas, 2019; Palalas & Wark, 2020; Palalas et al., 2020) supported by a systematic literature review by the authors in 2021- 2023. Drawing on HE graduate students' feedback from the three studies, DW-FOLD has identified eight dimensions with accompanying strategies: awareness, balance, attention, safety, identity, agency, community, and achievement (Figure 1).

Figure 1

Dimensions of DW-FOLD: Digital Wellness Framework for Online Learning Design



Note. Awareness icon (Self-Awareness – Icon by Adioma, 2024).

Methodology

Through secondary data analysis and a systematic literature review, the following steps were completed: identify and define the various aspects of and what constitutes digital wellness in online higher education learners; determine what beliefs, attitudes, and digital habits contribute to or deter digital wellness among online HE learners (excluding those aspects that have been proven non-essential to learner success and wellbeing); identify how the various dimensions interact/interrelate; review related existing frameworks and how they integrate the constituent parts into a whole-person pedagogical approach, if at all; discuss the eight dimensions in the DW-FOLD accompanied by online learning strategies and activities for HE courses that seek to promote successful learning while ensuring digital wellness.

Research Questions

The overarching research question is as follows:

What are the constituent dimensions of the Digital Wellness Framework for Online Learning Design (DW-FOLD) for higher education?

The sub-questions are:

(1) What are the characteristics and relations of the essential constituents of digital wellness?

(2) What factors, strategies, and habits (including digital habits and digital contexts) contribute to or deter digital wellness among online higher education learners?

(3) What online learning practices/strategies can promote the essential dimensions of digital wellness to be included in the framework?

Method

Context

The study is situated in graduate level courses in a Canadian online university and focuses on the course-level curriculum/learning design, i.e., the content, delivery, and technology choices that are in control of the instructor. We appreciate the ubiquitous importance of the larger organizational environment and its impacts, including the university technological infrastructure, digital policies and practices, the level of digital security at the university level, IT support, and so on; however, their inclusion would require a dedicated study.

Secondary Data Analysis

As stated earlier, the foundational investigation was sourced from a secondary data analysis of a qualitative anonymized dataset obtained through interviews with nine online learners in the Master of Education program in three previous studies (Palalas, 2019; Palalas & Wark, 2020; Palalas et al., 2020) including the unpublished systematic literature review conducted by the authors as part of this study (2021-2023). The participants of the three studies were mature students working as teachers and/or online learning designers in K-12, higher education, and workplaces representing three diverse cultural backgrounds. Two participants were long-term mindfulness practitioners, the other seven were introduced to mindfulness-informed practices and contemplative pedagogy during their graduate course taught by the first author. The anonymized interview transcripts were aggregated into an NVivo project and thematic analysis was conducted to identify the key dimensions of what respondents considered to constitute the experience of learners' digital wellness. Multiple iterations of individual as well as shared exploration and analysis were completed to refine the codes and the resulting main themes (Table 1); this ensured rigour and accuracy in the coding process.

Guided by the research questions and the mindfulness-based conceptual lens, the eight key themes were further redefined based on the informed exploration (literature review) and the relationships between the eight framework dimensions as described by the respondents. Aiming to create

an applied guide for online learning design, the dataset was also coded for factors that contribute to or deter digital wellness with practical strategies.

Literature Review

This qualitative study includes a comprehensive literature review seeking to identify relevant studies and theoretical frameworks reported in the last decade (2013-2023) in electronically published peer-reviewed English language journals and conference papers. The following databases include: Science Direct, Springer, ACM, Taylor and Francis, Web of Science Core Collection, and Google Scholar search engine. Additional search involves doctoral dissertations and books found in the Proquest Dissertations and Web of Science Core Collection databases. Combinations of keywords related to the research questions were used for finding relevant studies.

Findings

Table 1 summarizes the codes assigned to the feedback collected from students in response to the interview questions that pertained to their online learning experience characterized as beneficial to their holistic wellness. Subsequently, the codes are grouped thematically and (re-)labelled to reflect their common focus. Table 1 shows the eight themes which reveal the various interrelated dimensions of the proposed DW-FOLD.

Table 1

Themes and Codes

Themes	Codes With Cross-Referenced Mutuality in the Themes (included in brackets)
Awareness (AWR)	noticing, observing, accepting, reflecting, insight, awareness of our experiences via feelings, attention, habits
Balance (BL)	purposeful choices (AG), guided options/choices (AG), priorities (ACH, AG), intentionality (AG), essentialism, time balance, use of resources, learning path resiliency, quality over quantity
Attention (ATT)	focus, concentration, task switching, presence, depth versus breadth, engagement in the task at hand, contemplation, deep listening
Safety (SF)	trust, being cared for, respect, being seen for who you are, respect for individual differences/diversity (ACH, CM, ID), digital citizenship (ID), vulnerability (CM, ID)

Themes	Codes With Cross-Referenced Mutuality in the Themes (included in brackets)
Identity (ID)	authenticity, individual differences/diversity (ACH, CM, SF) digital persona, digital citizenship (SF), personal and professional life, whole person identity, socio-emotional needs, self-compassion, showing up (AG), projected/seen/ preferred view of the self/self-image, vulnerability (CM, SF)
Agency (AG)	showing up (ID), purposeful choices (BL), (guided) options/choices (BL), setting goals/priorities (ACH, BL), intentionality (BL), clear purpose, self-regulation (ACH), self-regulated learning, meaningful learning, awareness-based humble curiosity, empowered engagement
Community (CM)	reciprocity, cooperation, respect, cohort model, competition versus collaboration, empathy and compassion, interaction, individual differences/ diversity (ACH, ID, SF), vulnerability (ID, SF)
Achievement (ACH)	accomplishment, progress, productivity, satisfaction, self-regulation (AG), qualitative versus quantitative approach, setting goals/priorities (AG, BL), individual diversity (CM, ID, SF), different prior knowledge, growth/ evolution

Existing Frameworks

While there are a number of related frameworks and models, none of them address curriculum/ instructional design in the online learning context and how it impacts learners' holistic health. For the sake of brevity, only three of the examined frameworks are mentioned: The Mental Health Continuum by (Keyes, 2002, pp. 207–222) has been considered. The Mental Health Continuum refers to emotional, psychological, and social wellbeing (Keyes, 2002) and has been commonly used in measuring student wellbeing in post-secondary contexts (Canadian Association of College & University Student Services, 2013). Also studied was the Digital Flourishing® model designed by Digital Wellness Collective (2020), which speaks to digital practices the Collective identifies as essential: productivity, environment, communication, relationships, mental health, physical health, the quantified self, and digital citizenship. The Contemplative Technopedagogy Framework was considered, which encourages "scholars and practitioners to thoughtfully engage in technopedagogical decisions at all scales or any site within contemporary higher education" (Shanks, 2020, "Conclusion"). Online learning necessitates higher levels of digital space engagements invoking pressures that require a unique set of digital habits and practices to maintain a well-balanced use of technology. As represented in the pedagogy-technology yin-yang symbol within the DW-FOLD sphere (Figure 1), this research seeks to develop a framework attentive to complementary and interdependent technological and pedagogical principles within the sphere of integrated mindfulness-based practices.

Mindfulness

The reported research was built on studies which employed mindfulness-informed learning approaches. Mindfulness has been universally accepted as a positive and useful attitude and practice for supporting more successful learning. Stemming from two historical streams now widely acclaimed, one that is 2500 years old from traditional Buddhist science, and one that is 25 years old from Jon Kabat-Zinn's Mindfulness-Based Stress Reduction course (1996). These origins go beyond isolating psychological or physiological aspects of wellness but rather purport wholeness of being at the root of health.

The broadly accepted definition of mindfulness by Kabat-Zinn (1996) has been applied in our study: "The awareness that emerges through paying attention on purpose, in the present moment, and nonjudgmentally to the unfolding of experience moment to moment" (Kabat-Zinn, 2003, pp. 144–156). This definition suggests that mindfulness is about the achievement of clearer experience in the present moment through the purposeful utilization of awareness and attention. Informed by the mindfulness perspective, DW-FOLD aspires to support learner presence in their learning journey (both online and offline); where a balanced attitude emerges from empowerment, right optimism, and realism based on aware and intentional choice (Langer, 1993). Such approach is underpinned by the thoughtful selection of the pedagogical curriculum.

Pedagogy

In terms of its pedagogical underpinnings, the explored online learning design drew on the intersection of pedagogy of care (Burke et al., 2022; Burke & Larmar, 2021; Noddings, 2008; Zygmunt et al., 2018), contemplative pedagogy (Barbezat & Bush, 2013; Palmer, 2017; Zajonc, 2013), and constructivist approaches (Mayer, 2008; Piaget, 1972; Vygotsky, 1980). The key goal of these studied pedagogical approaches was to guide and motivate learners towards "being present" (Jeffrey et al., 2023) while constructing individual and collective learning experiences. It follows then that they would be able to interact fully at every point of their journey, out of choice, knowing that while it is their responsibility to engage, they can rely on their community of learners and their facilitator for support. Learning involves change and emergence that requires the right environment of support, trust, and belonging.

Definition of Digital Wellness

The notion of digital wellness has gained relevance as learners and teachers have been engaging with an increasing number of digital spaces, content, and tools, including artificial intelligence assistants. The definition and understanding of digital wellness, also referred to as digital wellbeing, varies among researchers and experts. In general, it pertains to an individual's overall health and quality of experience in the context of their digital and online activities. It involves achieving a balanced and mindful approach to using digital technologies to enhance one's physical, mental, cognitive, spiritual, and emotional health (e.g., Al-Mansoori et al., 2023; Roffarello & De Russis, 2023). In the context of online higher education, based on previous research and publications (Palalas, 2019; Palalas & Wark,

2020) and guided by the Digital Wellness Collective (2020) definition, the following definition was developed:

> *Digital wellness in online learning refers to the optimum state of holistic health, individual achievements, and social fulfilment that each learner using technology is capable of attaining while engaged in online learning*.

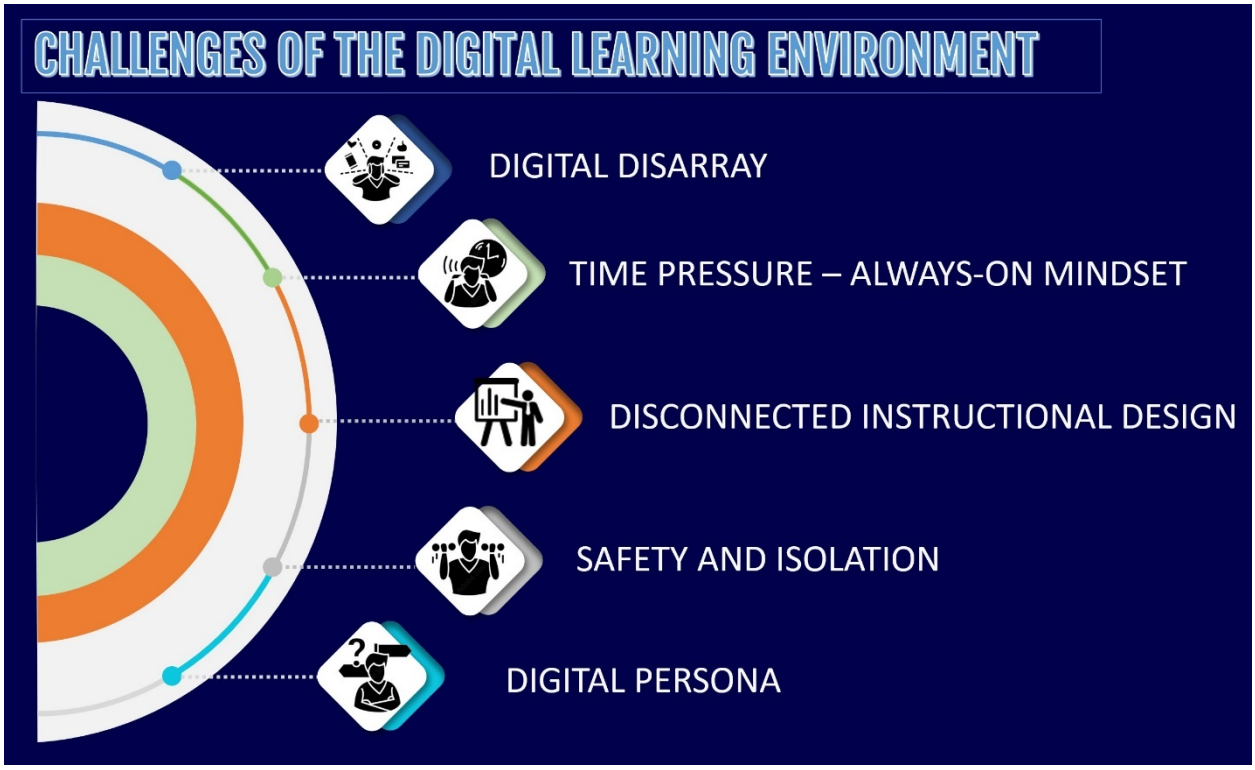
It is a state of holistic wellness (noun) that requires a conscious and intentional management of one's digital technology use that supports thriving as learners (and instructors) in online learning environments. It requires an ongoing practice of digital wellbeing (verb) – developing and sustaining healthy digital habits, maintaining a balanced relationship with technology, as well as minimizing the negative impacts of excessive screen time, digital distractions, and digital overwhelm. As per the Digital Flourishing® perspective, this holistic approach mitigates some of the harms of technology while empowering us to take advantage of its benefits (Digital Wellness Institute, n.d.).

Challenges of the Online Learning Environment

Environmental factors along with personal habits and choices often deter digital wellness among online HE learners. The following sub-sections briefly summarize the issues highlighted by the research participants and the literature (Figure 2).

Figure 2

Challenges of the Online Learning Environment



Digital Disarray

Many live overwhelmingly distracted lives, dealing with multiple roles and responsibilities within a digital forest of choices, tools, fake and real information, hyper-personal and de-personalized content; generative artificial intelligence; technology which inconsistently assists, confuses, even threatens…openly or in disguise. Economic and political agendas prevail surreptitiously via the Internet. As such, digital disarray suggests overwhelm and confusion are often related to digital technology misuse or overuse (Pegrum & Palalas, 2021).

As a result, attention may be challenged by information overload, the abundance of choice, the demands to operate numerous apps and tools simultaneously, a multiplicity of oral and visual stimuli as well as built-in algorithms and seductive design of digital technology. Unfortunately, digital information has led to the creation of these new distractibility habits through overwhelm, overuse, and overload (Mark, 2023) – attenuating the ability to connect with ourselves and others. If we already have a propensity to procrastinate, this cocktail of digital disarray can nullify our learning efforts and leave us discouraged as HE students. For a HE student, who acutely needs to access deep and critical thinking processes while online, digital disarray is a danger to their success and achievement.

Students need to be able to come into a course and leave these worries at the door so that they can engage in the learning process holistically. Moreover, they need to be aware of the benefits as well as challenges of the digital world so that they can make the right choices and develop the right digital literacies and habits. This starts with being able to discern reliable information from misinformation in the era of infodemic (a deluge of information) (Hua & Shaw, 2020; Scheibenzuber et al., 2021).

Time Pressure

Across the HE demographic, time pressure, fast-paced learning, and time constraints reportedly affect students' learning capacity. The well-known overload of information, tasks, and activities further inhibits our ability to take the time that is needed to find clarity. Neuroscience reports that we cannot multitask – we actually switch between tasks as our brains still need to concentrate on one task at a time (Mark, 2023). That said, it is possible to carry out repetitive tasks we already have physical muscle memory for, such as doing the dishes, while simultaneously talking on the phone. However, this is no comparison to a person performing mundane tasks to a student grappling with complex content they need to assimilate into an original thought paper. Deep thinking and multitasking are contradictory anomalies because meaningful, purposeful thinking requires our focus and presence (Jeffrey et al., 2023).

Considering the differing assignment tasks and deadlines facing the HE online student, typically balancing work and family responsibilities, it is not surprising that HE cohorts reported struggling to find quiet, uninterrupted moments for deeper thinking. Across the literature, throughout the North American corporate world, and in our experience, there is an expectation to be working 24/7 (Rose, 2013). Even if the university faculty work to mitigate this driving force, the students reported they tend to pass on the same expectations of their professors, that is, to be available and provide requisite feedback 24/7.

Related to time pressure, the "always-on" mindset mirrors our net-connected world offering non-stop communication and media channels through our handheld or desktop digital devices able to access global human society at any time, day or night (Turkle, 2023).

Disconnected Instructional Design

Related to the dilemma of confusion which results in a lack of progress in our learning goals, the instructional design of the HE course can make or break our engagement. Sometimes the technology is overused, either in the form of too many multimodal elements designed to catch our attention with graphics and visual appeal, or in the form of content contagion from too many articles or assignments in relation to the timeframe, or because the cognitive stretch for the student is too great.

Whereas faculty may believe the courses are clearly laid out, respondents reported a lack of clarity. Levels of self-efficacy are directly correlated with levels of confusion in proceeding with tasks. If it is unclear how to proceed, time is wasted in grappling with the issue, thus exacerbating the time pressure dilemma as deadlines approach.

Digital Safety and Isolation

If distance education curriculum design is lacking the development of community within a cohort, the academic journey is much lonelier than a face-to-face course. This gap undermines any sense of trust, connectedness, and relatedness that is sine-qua-non for a healthy community of learners. For over a decade, research has highlighted privacy and safety concerns that make the online space insecure (Callan, 2016, Fiege, 2020; Walther, 2007); the feeling of isolation in the world of hyper-connection - with "social systems in which people are always on: available for communication anywhere and anytime" (Quan-Haase & Wellman, 2006, p. 331); mental health and burnout leading to avoidance/ withdrawal; an ever-increasing pace limiting engagement (Levy, 2017). The feeling of isolation in the world of hyper-connection can invoke a sense of insecurity. Scamming, website hacking, and identity theft extend the concerns around privacy and cyber-security in the digital environment.

Digital Persona

Online interaction that is demanded by social media norms such as Facebook, TikTok, Instagram, and other social media platforms, can result in a digital persona that is not authentic, a staged entity requiring us to constantly assess and obsess over our online image which is publicly accessible to a global audience of potentially billions of viewers. Paradoxically, online learners who tend to spend excessive screentime on their devices, supposedly connecting with others through social media, frequently feel disconnected from the "real" people. They are plugged in yet tuned out, not present, or engaged. The term "digital persona" was used by respondents to highlight the potential negative aspects of "conceal[ing] aspects of the offline self and embellish the online" (Bullingham & Vasconcelos, 2013, p. 102). De Kerckhove and De Almeida (2013) elaborate that digital persona, as introduced by Clarke in 1994, is "a part of the individual identity that has been extended into the online sphere which corresponds to a digital unconscious structuring, a digitally divided self" (p. 277).

Discussion

The Eight Dimensions of DW-FOLD

As shown in Figure 1, DW-FOLD dimensions with their accompanying instructional strategies seek to reveal opportunities to address the digital challenges identified above through technopedagogical care (Burke et al., 2022). Each dimension is given a definition, linked to the digital challenges it primarily addresses, further described and followed by examples of strategies and resources to support the development of that quality in the student(s) - practices that help maintain the habit to motivate learners' self-regulation. With the right technology - pedagogy present, the eight dimensions complete and reinforce each other, with awareness ubiquitous to all of them, introduced as the first and overarching dimension.

Awareness

The Awareness (AWR) dimension of DW-FOLD encourages online learning design that targets learners' awareness of their online learning behaviours, competencies (knowledge, skills, attitudes, beliefs), and how they affect their cognition, emotions, mind, as well as social, physical, and spiritual wellbeing (with an "internal climate of friendliness" towards experience). Awareness is identified as the key quality to develop and practice in digital interaction and communications; it is the overarching dimension.

Awareness can be defined as the ability to perceive, to feel, or to be conscious of events, objects, thoughts, emotions, or sensory patterns (Brown & Ryan, 2003). It is also explained as the "background radar of consciousness" (p. 822), whose role is to continually monitor the inner and outer environments, while attention represents the process of focusing that awareness. Awareness is fundamental to the DW-FOLD dimensions. Self-awareness combined with awareness of the digital circumstances and actors we interact with promotes informed choices and self-regulation. When we quiet and focus our mind…and observe, we are able to access information that otherwise might not be available to us. This leads to an awareness of our habits not just intellectually but also somatically – how they impact our body and sensations.

Awareness Strategies

- Monitoring and reflecting on factors such as average screen time spent on the learning platform, multitasking tendencies, procrastination strategies, distraction with unrelated content, and/or mindless scrolling
- Online forums discussing how digital habits may be impacting our holistic health
- Multimedia artifacts which discriminate between helpful and harmful digital tools and their usage that benefit or deter from learning
- Resources, tools, tips, and strategies such as a digital habit journal to promote learner consciousness

- Information on potential ethical and socio-cultural effects of digital content, technology, spaces vis-a-vis online learning and technology-mediated interactions
- Meditation arrival practices, such as a body scan or A.W.E practice (The Power of Awe, 2022)

Balance

The Balance (BL) dimension of DW-FOLD refers to purposeful choice of online learning materials, activities, and tech tools as well as time allocations and requirements to maintain learner engagement and meaningful learning while avoiding overwhelm, distraction, and burnout. Balance directly addresses the burnout challenges described in Digital Disarray, Time Pressure, and Disconnected Instructional Design (Figure 2).

Balance is needed, modelled, and required amongst materials, activities, and tech tools vis-a-vis time allocations and requirements to promote learner engagement and meaningful learning process. Designing for balance requires vigilant selection of all the components of the course to include only those required elements that are essential to all students' learning along with optional elements that address diverse needs and individual preferences. Facilitator availability and guidance in providing this learner agency is modelled throughout the DW-FOLD dimensions. Higher education participants appreciated the "structured flexibility" approach to the course: a clearly communicated structure of essential resources, activities, and timelines; flexibility and choice in the form of optional resources and digital tools; and negotiated schedule and activities. Balance strategies foster flexibility through the interplay of reliance and independence between learner and facilitator.

Balance Strategies

- Both online and offline, synchronous and asynchronous learning activities carefully designed with attainable digital and time accessibility
- Orientation sessions introducing choices to balance workloads
- Regular checkpoints in the course via pathway monitoring tools or synchronous chats with the facilitator to adjust expectations, negotiate schedules and activities
- Visible schedules and progress monitoring apps for observable tracking
- Facilitator coaching to regularly "unplug" online or offline
- Guidance given in creating ergonomically appropriate workspaces
- Digital decluttering activities to demonstrate how to keep computers organized (free of old files, tabs, email)
- Digital detox before learning activities, e.g., silencing notifications as a pre-task ritual
- Choice of digital tools purposefully geared to the curriculum
- Reminder and modelling of mindfulness practices

Attention

The Attention (ATT) dimension of DW-FOLD is summarized by the updated definition of attentional literacy put forth by Pegrum and Palalas (2021):

> Learner's ability to intentionally direct their attention, in the present moment, toward information originating from the self, others, and the environment (analogue and digital), and to sustain that attention by choice, while becoming aware of and remaining non-judgmental towards new perspectives, multiple viewpoints, and shifting contexts. (p. 8)

Attention addresses the challenges described earlier in Time Pressure and Digital Disarray (Figure 2). Mark (2023) observes that, while digital technology might be designed to boost our capabilities and productivity, daily usage of screens and devices can lead to increasing distractibility and exhaustion. She observes that the nature of attention has gradually changed globally as a response to technology. Mark furthers that the factors affecting our focus are different for diverse individuals. Once we understand our own patterns, we can learn to develop "attentional muscle" with repeated new behaviours.

Attention Strategies

- Resources, tools, tips, and strategies to help learners understand the effects of distractions and overwhelm
- Deliberate attentional literacy activities to develop ability to focus/concentrate such as mindful listening (Mind Tools, 2023)
- Encouragement to do one task at a time with an intention and deep engagement, e.g., focus on one thing/task for a stretch of time and observe one's attentional capability
- Concentration-based practices/meditations, such as breathing (e.g., Berkeley University, n.d.)
- Centering practices within synchronous sessions: time to pause, calm the mind, and practice stillness
- Opportunities to discern when their attention is "wandering" and practice resisting that tendency, e.g., an at-hand reflection journal

Identity

The Identity (ID) dimension of DW-FOLD refers to learners' ability to present their authentic selves out of conscious choice (as opposed to by default). Identity denotes recognizing, establishing, and maintaining a digital identity aligned with their integrated personal and professional selves. The nature of this digital self would embrace an ethical and respectful attitude in co-constructing an inclusive and safe online environment which essentially embodies digital citizenship. Identity addresses the challenges described in Safety and Isolation and the Digital Persona (Figure 2).

Higher education cohorts in this study affirmed this struggle with potential dissonance and conflicting pulls in presenting their authentic selves and at the same time creating the desirable image of

a successful hardworking student. Learners at any level, especially those who are new to a course or a cohort, are more emotional than cognitive (Illeris, 2002). They aim to establish their identity in a new situation by gauging their digital surroundings; who they are with their colleagues and professor; what they are learning - the purpose of being there (Merriam et al., 2007a); and what is expected of them – their knowledge level and online netiquette behaviours. Often an "alternative persona" (Bullingham & Vasconcelos, 2013, p. 102) is cultivated to promote gains in their professional and academic life.

Considering this initial unspoken unease and the desire to project an "appropriate" self-image, instructors should dedicate space and activities for learners to introduce themselves and socialize to the degree possible. At this point, belonging, confidence, and acceptance play a bigger role than the cognitive goals. A slow ramp-up into the learning content accompanied by conversations around the relationship of online identities and digital citizenship may assist in achieving this confidence (Merriam et al., 2007b).

Facilitators can also help cultivate these digital personas through positive and reassuring responses (Levy, 2017) with activities highlighting the ethical landscape of digital citizenship - the responsible and ethical use of technology, including respecting others' privacy, combating cyberbullying, and contributing positively to all online communities (Zhong et al., 2021).

Identity Strategies

- Individual digital footprint analysis by searching their own name followed by discussions of the implications uncovered
- Modelling and reinforcement of appropriate online etiquette as different from social media interactions (Levy, 2017)
- Invitations to guest speakers (synchronous or video) to share their expertise about online identity
- Mindfulness practices to connect with the authentic self, self-view, and self-compassion (Self-Compassion, 2023)
- Avatars to express their own personas, internal assumptions, arising emotions
- Digital citizenship quiz/game with focus on Identity (e.g., 13 Digital Citizenship Quizzes, Questions, Answers & Trivia, n.d.)

Safety

The Safety (SF) dimension of DW-FOLD extends to the notion of learners' digital safety. Safety addresses the challenges described above in Digital Persona and Digital Isolation and Safety (Figure 2).

Participants reminded us that safety comprises four different levels of online interaction, namely, within the self, with others including instructors, with content, with digital technology and its environment. In DW-FOLD, SF is viewed as learners experiencing a sense of confidence and ease in participating in authentic interactions, communications, and creative activities within a secure shared

learning space marked by connection and trust; that includes socio-emotional, cognitive, and physiological safety.

In terms of socio-emotional safety, the National Center on Safe and Supportive Learning Environments (NCSSLE) in the USA concludes that:

> The safer students feel emotionally, the more likely they are to learn and thrive. Conversely, students who feel emotionally unsafe or stressed face barriers to learning as they may grapple with embarrassment, boredom, and frustration when faced with difficulties or challenges. (2019, para 1)

Fiege (2020), who explored emotional safety and identity expression within online learning environments in HE, underlined the related notion of "dignity safety" that encapsulates components of what emotional safety mean, “Trust, respect, and equality need to underpin social interactions and cooperative learning initiatives” (p. 37). Callan (2016) warrants that digital dignity values the security people feel when they are treated as equals even when negotiating conflict or experiencing vulnerability.

Indeed, Schepers et al. (2008) confirmed that feeling emotionally safe was positively associated with goal achievement, personal engagement, motivation, and lessened anxiety. Research around social-emotional learning has offered guidance in how to create emotional safety by fostering a supportive and respectful learning environment. For instance, Geesa and colleagues (2022), in their exploration of social-emotional learning in PK-12 online environments, identified six elements required for educators to foster learning communities that are “safe, healthy, and just” (Casel, 2021, para 2). They recommend encouraging participation versus perfection by, for example, promoting experimentation resulting in mistakes. "Students will allow themselves to experience failure only if they can do so within an atmosphere of trust and respect” (Immordino-Yang & Faeth, 2010, p. 79).

Participants spoke to the value of activities and atmosphere that beholds human vulnerability and thus encourages curiosity and experimentation; this translates into cognitive safety pertaining to the intellectual well-being of learners. Online learning environments should inspire reflective and critical thinking (Dede, 2002), open dialogue and flexible thinking (Bush, 2013), advocate for social equitability (Mason & Jones, 2020), and explore diverse perspectives.

Finally, learners' physiological safety involves ensuring that their physical well-being is not compromised by online learning, primarily the sedentary lifestyle and excessive screen exposure. Educators should consider factors like screen time and ergonomic best practices. Providing guidelines on screen usage, encouraging regular breaks, and promoting good posture can mitigate the risks associated with excessive screen exposure and ergonomic best practices.

Safety Strategies

- Active listening and speaking practice for positive reinforcement and appreciation from the get-go; listening to students and their intentions to allow students to let their guard down and relax
- Feedback appreciation via messages of recognition

- Synchronous rounds with screen-shared, graduated questions regarding their experience of safety e.g., 1. share your strengths/talents; 2. write something about yourself that no one would guess; and 3. list challenges you face in the program. Debrief follows all rounds aiming for safety in the gradual unfolding of personal stories
- Student journals on what makes individuals human, how individuals make sense of and experience the world, and how individuals are the same or different
- Guided self-compassion practices to recognize, accept, and process common human feelings and sensations such as discomfort, fear, anger, and unhappiness (Irizarry, 2022)
- "Just like me" compassion practice (Jeffrey et al., 2023, pp. 9–10)

Agency

The Agency (AG) dimension of DW-FOLD is viewed as learners' individual and collective capacity for intentional action experienced through opportunities to identify, enact, and cultivate learner self-regulation and co-regulation with respect to digital technologies and how they impact the agents, their choices, and their circumstances. Agency addresses the challenges described in Digital Persona and Digital Isolation and Safety (Figure 2).

In the multi-faceted aspects of agency, participants referred mainly to the experience of feeling in control over their own learning and their overall well-being, in particular highlighting two interrelated notions of learner self-regulation and emotional regulation. The term "emotion regulation" was applied in accordance with Gross's (2014) definition, i.e., "shaping which emotions one has, when one has them, and how one experiences or expresses those emotions" (p. 6). Participants stressed the significance of emotional balance for fruitful self-regulated learning – the "active, self-directed processes involving: goal-planning; monitoring and controlling cognitions, motivations, and behaviours aimed at fulfilling goals; and achieving goals" (Palalas & Wark, 2020, p. 164). By fostering learner agency in a safe environment, as discussed above, instructors can empower students to actively engage in authentic self-regulated learning and humble curiosity. By recognizing individual intentions of each learner and the tension that they might cause in shared digital spaces, instructors would invite students to fully show up when it is accessible to them technologically, emotionally, and cognitively. Students concluded that

> With time and practice [they] experienced what was meant by present-moment awareness and insight which allowed [them] to uncover [their] true motives, manage [their] attention, apply more focused purpose to [their] learning, and approach the online learning experience with more agency and less anxiety. (Palalas et al., 2020, p. 259)

Co-regulating their emotions and intentions with those of their cohort enabled a culture of trust and compassion that respects other people's truth, their time, and their collective understanding of everybody's unique roles.

Agency Strategies

- Arrival/check-in practices at the opening of live or recorded sessions followed by debriefing, and intention-setting
- Discussions (or/and journaling) about intentions and goals and helping learners monitor their evolution
- Guided individual and collective decision-making concerning the process and elements of the learning path (e.g., required versus optional readings or multimedia assignment options)
- Built-in pauses (e.g., in a webinar recording) as a reminder to check in with themselves regarding their present engagement needs and adjust their intentions accordingly
- Value-based exercise to select three values from the core values list (e.g., Clear, n.d.) and reflect in their journals vis-à-vis their digital habits
- Self-regulation skills with respect to digital technologies, (e.g., The Pathway to Success, n.d.)
- Empowerment of self-beliefs, goal setting, and expectations through messages, reminders, feedback

Community

The Community (CM) dimension of DW-FOLD encourages learning design that results in a bonded and caring community of learners who connect, communicate, and reciprocate respectfully through meaningful interactions so that they experience genuine relatedness and co-presence. Community, woven through the other dimensions, directly addresses the challenges described in Digital Isolation and Safety.

It is our genetic impulse to share and cooperate. To leverage these natural tendencies, learners should be encouraged to apply their socio-emotional and ethical intelligence in their communications and interactions with others. Starting with explicit conversation regarding the value of collaboration, learning activities invite collective effort and co-creation of knowledge.

Further to the development of community, synchronous group activities speak to our social brain. However, current trends favour flexibility, anytime learning; that translates to asynchronous learning. There is negotiation to be sought in cohort community, such as time zone considerations. Often we do not want to “waste time” working with others. Cohort-based means our journey is no longer everyone for themselves, thus removing some of the flexibility inherent in the self-paced model (Hoven et al., 2020). For this, the cohort model is often criticized. People have chosen the freedom and flexibility of learning at their own pace and availability. The demographic at open universities is usually older working adults. However, the dropout rate of isolated learning countervails the benefits of completely asynchronous learning.

A cohort-based model supports the social brain and promotes self-regulation through co-regulation. Discussion posts are more courageous, and the interchanges are richer when students feel

accepted in expressing their thoughts. A sympathetic cohort can support each other in completing requisites simply by encouraging each other with a few words in a forum post or group discussion.

Small-cohort learning has been extensively researched as one of the best elements for successful learning (Blumenfeld et al., 1996). It also models the workplace, where small teams solve problems or create product. In a cohort-based class, we can design loops of experimentation and peer/facilitator discussion.

A bond formed in a collective group ideally develops mutual responsibility. This allows the community to share their values, goals, intentions, and vulnerabilities so they can "see" each other for who they are; a community that they can trust and with whom they can share a safe space.

Community Strategies

- Articulation of the benefits and modelling of peer feedback practices and modelling peer feedback practices through discussion
- Collaboration on learning activities via screen-share apps (e.g., Padlet, Stickies, Mentimeter, Zoom Whiteboard) to post their thoughts jointly but anonymously followed by optional debrief, e.g., answering a question: "On a scale from 1 to 10 how engaged do you feel in this session?"
- Negotiation and co-creation of cohort rules of engagement and interaction (Note the importance of participation was evident by its generous percentage in the overall course grading)
- Definition of an escalation process - when issues arise, there is a path of recourse
- Collective gratitude activities in a shared document

Achievement

The Achievement (ACH) dimension of DW-FOLD refers to learners following their individual intentions where they can see their own progress in using digital technology to learn and master a subject/skill; they fully experience their own success and achievement; they feel a sense of accomplishment that is not measured solely by marks but is regularly recognized and celebrated in a meaningful way. Achievement directly addresses the challenges described earlier in Digital Disarray and Time Pressure.

Achievement comes in many different shapes. Instructional design should provide options and choice for students on when and how to measure their learning. For example, the design could provide ways for students to set their own goals per session or per period of time or per unit. Technology affordances can measure their progress on the learning path towards clear milestones such as progress bars, markers, notifications, and other interface components.

The ACH dimension celebrates achievement for recognition of meaningful effort and for enjoyment in the learning process. Technology can add to learner agency through familiarity – the combination of scaffolded pedagogy and technology can lead to successful completion of the task at hand. Academic achievement heightens motivation and motivation supports self-regulation leading to

increased self-efficacy; that in turn empowers learners to enter the next cycle of learning. Respondents recognized that the process of learning involves making mistakes which are moments of growth.

Achievement Strategies

- Progress indicators with self-check mechanisms (seeing good results reinforces students' efforts)
- Continuous achievement recognition with messages, games, quizzes, or instructor comments
- Prompt attention to struggles to mitigate discouragement
- Introduction of the concept of honouring intention versus goals
- Discussing the concept of failure as a step towards mastery, e.g., allowing assignment resubmission to improve quality of achievement
- Creating a rubric following students' values and intentions
- Monitoring student intentions via touchpoints which align with the course objectives
- Celebrating milestones in the course as a group

Significance

The overarching goal of the DW-FOLD framework presented in this article is to promote healthy and pedagogically sound online learning environments and assist online educators/instructional designers (and by extension, the students they serve) in implementing educational design and practices that optimize learner wellbeing and academic success. The framework was born out of several studies and our teaching experience as professors of open, digital, and distance education.

In conclusion, the field of online learning, and education in general, could benefit from this exploration into reducing academic and digital stressors. The eight dimensions of the DW-FOLD framework can be applied in learners' and educators' day-to-day online academic, professional, and personal lives. The study put forth new evidence-based knowledge how this practice-oriented framework could be applied for designing and refining online learning as well as transitioning face-to-face learning into the digital space. It has a potential to positively affect the digital wellbeing of online learners across disciplines.

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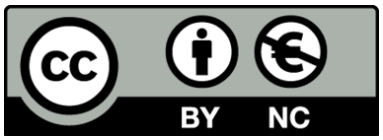

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Self-Talk: Musing on Distance Education. (2023). By Sanjaya Mishra. Zenodo.

226 Pages. ISBN: 9798393498689.

Reviewed by ***Sayantan Mandal****, Indian Institute of Technology Jammu*
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"The experience trap limits organisational thinking at times of uncertainty." (p. 150)

Self-Talk: Musings on Distance Education is a compilation of blogs and a series of reflective writings written by the author on open and distance learning (ODL) and online learning, accounting for over three decades of his experience. The cornucopia of his ideas and anecdotes pertains to the key innovations that hallmarked developments in ODL and online learning. The book shares much-needed pathways to re-imagine compromised education in the post-pandemic world. At the time of writing this book, Dr. Sanjaya Mishra worked as the director of education at the Commonwealth of Learning (CoL) in British Columbia, Canada. The book is primarily based on his prior trove of experiences as a distance educator at the sole centrally-funded open university in India, the Indira Gandhi National Open University (IGNOU). The goal of this book is to understand the developments in distance education, including the changing roles of teachers and students, with critical discourse centred around IGNOU, based on lessons learned globally and specifically from engagements at the CoL. The book comprises six sections, encompassing 45 chapters.

The author modestly titles the book "Self-Talk". However, this book offers insight into the author's reflective journey to make sense of changes in ODL and online learning. It is in this context that we view the book's title. The intended audience is mostly distance education teachers, but there are examples, critical discourses, and suggestions that may act as a reference tool for policymakers and as a primer for researchers. In particular, some chapters related to curriculum development and online learning are not specific to ODL and may benefit curriculum developers and teachers in traditional institutions who wish to embrace online learning.

The book excavates how ODL remained a second chance until the pandemic. It underscores the changes in ODL and online learning catalysed by technological interventions and illuminates the need to innovate and learn, despite the redux in the post-pandemic period. Although it is a blog-based book, each chapter is stand-alone, and different chapters in any given section may be interesting to a wider audience. For instance, though the first section is a primer to understanding distance education, it also introduces a suggestive curriculum that may be of

specific interest to distance education teachers. The organisation of chapters depicts some degrees of overlapping, which is justified by the context of the conglomeration of blogs and other associated literature written by the author. The chapters need to be read in a specific context and time to appreciate the discourse.

The book is thoughtful, not restricting itself to understanding the developments of distance education, but brings to the table critical discourse on a wide range of allied concepts rooted in personal experiences, thereby giving a nuanced bottom-up understanding of the realities. It also provides a hint of flavour to various aspects through the author's fleeting and divergent thoughts. It is reflected in the author's discussion pertaining to the genesis of distance education through Keegan's (1988) and Taylor's (2001) work, wherein he refers to the United Nations (2023) Sustainable Development Goal 4 – quality education – then turns to the massive open online courses (MOOCs), and the subsequent thought relates to the need for a qualification framework. The contemplation extends along three dimensions: (i) the changing geography, from the global level to the Commonwealth countries and further to the Indian context through the case of IGNOU; (ii) the switching education levels, from school to higher to vocational education in the distance and online modes; and (iii) the transposing time, from pandemic-focused to pre- and post-pandemic times.

The first section revisits the history of distance education, discussing the roles of distance education teachers. In the next section, we note the book transposing from ODL to blended learning, encompassing a generic regulatory framework for blended learning. The third section focuses on open education, built on the virtues of "fairness, flexibility, and freedom" (p. 47), and also discusses problems with credentialing MOOC courses and the open educational resources (OER) movement. The subsequent section talks about pedagogical affordances through technological interventions, including video-based learning using blogs, radio, SMS in teleconferencing sessions, and EDUSAT (educational satellites). It also proposes an interaction, motivation, pedagogy, access, cost, and training (IMPACT) framework to guide decisions on the deployment of technologies. The fifth section revolves around different aspects of IGNOU, from community colleges to dual modes, and from issues related to equivalence to problems in conducting assessments. It talks about chaos in online learning and the dismantling of student support services. The sixth section questions the resistance to "change" in the education sector and finally emphasises the need for strategic foresight in planning.

The primary strength of the book is its deeper reflection, as evident through the author's remark that "most of the time, decisions are taken that are not in tune with distance education practices worldwide [...]" (p. 9). The book encompasses visionary ideas like proposing blended learning as a policy, which is not in place till date in the Indian context. It also takes a step forward by raising pertinent questions about the philosophy of distance education in general and IGNOU in particular. The author eloquently questions, "[...] are we unconsciously moving towards making distance education synchronous? Are we predominantly thinking that distance education should have synchronous interactions?" (p. 91). Taking a critical stance on certain

initiatives by the IGNOU, the author raises the following thought-provoking question, “how does IGNOU plan to reach the unreached through face-to-face programmes?” (p. 101). Thus, the book raises very pertinent and timely questions, calling for serious redressal.

Despite the book's critical outlook, it sometimes takes a linear approach while developing a few arguments. For instance, the author’s definition of blended learning as “the thoughtful use of face-to-face and online learning.” (p. 5) is more technology-centric and less focused on pedagogy. This can be supported by further argument when the author proposes that 30% - 79% of content can be delivered online through blended learning. Bearing in mind that the suggestions arising in the book are based on the author’s long experiences of working in the sector, and therefore are very valuable.

Overall, “Self-Talk: Musings on Distance Education” provides an excellent overview and some pertinent questions on various aspects related to open and distance learning and online learning. It does not claim to introduce ground-breaking concepts but rather offers an enjoyable, reflective, and thought-stimulating reading experience that can attract a diverse audience, including those engaged in distance education, studying it, or simply seeking a better understanding.

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