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Affordances and constraints of synchronous and asynchronous computer-mediated collaborative writing formats in doctoral writing groups: A comparative literature review

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Abstract

This conceptually informed narrative literature review, guided by affordance theory and the Community of Inquiry framework, examines the affordances and constraints of synchronous and asynchronous formats within doctoral writing groups, comparing how each format supports or challenges collaborative writing. The review finds that synchronous interactions can enhance collaboration by providing immediate feedback and fostering a strong sense of community, while also noting the potential scheduling difficulties associated with real-time engagement. Conversely, asynchronous interactions enable more thoughtful reflection and allow for greater reflexivity, though they may lack the immediacy and interpersonal connection of synchronous sessions. By analysing these dimensions, the review illuminates how each format shapes the dynamics of collaborative learning, reflective practice, and knowledge construction within doctoral writing groups. Drawing on a model of instructional design, this paper extends existing discussion on how digital technologies shape collaboration, knowledge construction, and academic writing development in doctoral education. Furthermore, it highlights how these writing groups function as knowledge-building communities where doctoral students do not merely exchange drafts but actively co-construct ideas through iterative discussion and feedback. Ultimately, it suggests that a hybrid approach that combines the immediacy and social connection of synchronous interactions with the flexibility and reflective depth of asynchronous methods may provide the most balanced and effective support for doctoral students' writing development.

Introduction

In recent years, digital technologies have become deeply embedded in academic and professional contexts, reshaping how individuals interact, collaborate, and share information. In higher education, the integration of digital tools has significantly enhanced accessibility and enabled more flexible collaboration across diverse group sizes and geographical locations (Bond et al., 2020). Within this transformation, computer-mediated communication (CMC) has emerged as a crucial mechanism for enabling collaborative engagement, particularly in terms of academic writing. Initially defined by Herring (1996) as "communication that takes place between humans via the instrumentality of computers" (p. 1), CMC encompasses both synchronous and asynchronous communication modes (Wang & Devitt, 2022). Building on the functionalities of CMC, computer-mediated collaborative writing (CMCW) is defined as the process of co-authoring written content through digital platforms such as shared documents, forums, or specialised collaborative writing software (Li, 2018). The ongoing evolution of digital technologies has deeply influenced higher education, redefining academic writing and collaboration through the growing use of computer-mediated communication tools.

Synchronous communication tools, such as Zoom, Microsoft Teams, and Google Meet, foster immediate interaction, promoting dynamic exchanges. In contrast, asynchronous tools, including email, discussion boards, messaging services such as WhatsApp, and collaborative platforms such as Google Docs, enable participants to engage in writing at their own pace, facilitating deeper reflection on shared content. However, the effectiveness of these tools depends on how users perceive and utilise these potential affordances. Adopting an affordance theory perspective (Gibson, 1977; Norman, 2013), affordance here is used to refer to the possibilities for action enabled by a system's design (Hoang & Pretorius, 2019). Importantly, affordances only become meaningful when recognised and utilised by users, so Norman (2013) refined this concept by distinguishing between perceived affordances (i.e., what users believe they can do) and actual affordances (i.e., the system's true capabilities). Misalignment between these affordances may lead to inefficiencies, particularly in the exchange of feedback and collaborative decision-making. Affordance theory also intersects with instructional design models, which highlight how digital tools shape cognitive engagement, social interaction, and teaching presence in collaborative learning environments (Garrison et al., 1999).

Beyond its functional role, CMC aligns with key instructional design principles, particularly those outlined in the Community of Inquiry (CoI) framework (see Garrison & Anderson, 2003; Garrison et al., 1999; Zhu et al., 2019). CoI emphasises the importance of cognitive, social, and teaching presence in shaping educational experiences in online learning environments (Garrison & Anderson, 2003; Garrison et al., 1999; Wertz, 2022; Wilson & Berge, 2023). Cognitive presence refers to the extent to which learners can develop and validate understanding through ongoing dialogue and reflective thinking (Garrison et al., 2001; Moore & Miller, 2022). Social presence is the capacity of individuals to connect with their learning community, engage in purposeful communication within a supportive environment, and build interpersonal relationships (Garrison, 2007). Finally, teaching presence refers to how instructors design, guide, and facilitate both cognitive and social interactions to achieve meaningful learning outcomes (Anderson et al., 2001; Martin et al, 2018). Previous research has demonstrated that doctoral writing groups play a crucial role in fostering safe and supportive learning environments where students engage in reflective practice (see, e.g., Cahusac de Caux & Pretorius, 2024; Cahusac de Caux et al., 2017; Hradsky et al., 2022). As such, we believe the CoI framework provides a compelling lens through which to analyse how synchronous and asynchronous tools either support or constrain the emergence of scholarly communication, the articulation of academic voice, and the collaborative construction of knowledge within these groups.

Doctoral writing groups provide a supportive environment for collaboration, feedback, and knowledge construction, reinforcing writing as a socially mediated practice rather than an isolated endeavour (Bergen et al., 2020; Cahusac de Caux & Pretorius, 2024; Chakraborty et al., 2021; Dusdal & Powell, 2021). These groups generally take one of two formats: some groups focus on providing space for dedicated individual writing (see, e.g., Wilson & Cutri, 2019, 2021) while others focus on collaborative writing and providing feedback on written work (see, e.g., Cahusac de Caux & Pretorius, 2024; Lam et al., 2019). Doctoral writing groups have been extensively studied in recent years, demonstrating their significant benefit in terms of academic writing quality, quantity, confidence, and reflective practice (see, e.g., Aitchison, 2009; Aitchison & Guerin, 2014; Cahusac de Caux et al., 2017; Cahusac de Caux & Pretorius, 2024; Chakraborty et al., 2021; Faulconer et al., 2010; Ferguson,

2009; Lam et al., 2019; Lee & Boud, 2003; Li & Vandermensbrugghe, 2011; Murray & Newton, 2008; Stracke & Kumar, 2014; Wegener et al., 2016). Importantly, research has also highlighted that these groups foster academic development, helping participants develop a sense of belonging within the traditionally isolated space of academia (see, e.g., Hradsky et al., 2022). Pretorius et al. (2022) explain that "academic identity, as a part of our identity, is shaped in the context we find ourselves and therefore refers to the stories we tell ourselves about who we are, who we are not, and who we would like to or should be in academia" (p. 7). As such, the design and facilitation of online doctoral writing groups are likely to significantly affect how students position themselves within academic discourse communities.

Doctoral writing groups are increasingly incorporating CMCW tools. Within these groups, synchronous tools enhance peer interaction and real-time discussion, whereas asynchronous tools allow for extended reflection and revision cycles. While previous studies have examined the pedagogical benefits of doctoral writing groups, fewer have critically investigated how digital affordances shape collaborative writing outcomes in doctoral education. Existing research tends to focus either on the instructional benefits of writing groups or the functionalities of digital tools, without systematically comparing how synchronous and asynchronous affordances and constraints interact in these settings. This review critically examines the affordances and constraints of synchronous and asynchronous digital environments in doctoral writing groups, highlighting their respective contributions to collaborative writing, reflective practice, and knowledge construction. By synthesising insights from existing research, this study evaluates how digital tools facilitate collaboration within writing groups while also identifying challenges such as accessibility, digital literacy, feedback quality, time management, and academic identity formation. Given the complementary strengths of synchronous and asynchronous tools, this review proposes a hybrid model which provides a more effective framework for supporting doctoral students' writing development. To achieve these objectives, this study is guided by two key research questions:

1. How do synchronous and asynchronous digital tools afford or constrain collaborative writing in doctoral writing groups?

2. In what ways can a hybrid approach integrate the strengths of synchronous and asynchronous formats to enhance doctoral students' writing development?

Method

Review design

This study reports a conceptually informed narrative literature review with a comparative focus. A conceptual narrative review was selected for its emphasis on interpretive synthesis and theory development, enabling cross-disciplinary integration, rather than simply mapping the breadth of existing evidence as in a scoping review (Kalenjuk et al., 2025). Conceptually, the review is informed by affordance theory, which guided our attention to the action possibilities and constraints created by different digital tools and configurations, and by the CoI framework, which directed our analysis towards the quality of social relationships, depth of engagement with ideas and writing, and the forms of design and facilitation that shape doctoral writers' experiences. Rather than aiming to exhaustively map all research on doctoral education and digital tools, the review synthesises and compares how synchronous, asynchronous and hybrid computer-mediated formats afford and constrain collaborative writing in doctoral writing groups, and how these formats support or hinder these forms of presence for doctoral writers.

Conceptual lenses

Affordance theory sensitised our analysis to the action possibilities and constraints created by different digital formats for doctoral writers, for example, opportunities for immediacy, flexibility, visibility of writing, and access to peers and supervisors, as well as barriers related to time zones, infrastructure, or self-regulation. The CoI framework drew attention to how synchronous, asynchronous and hybrid environments supported or hindered social presence (relationships and sense of community), cognitive presence (deep engagement with ideas and writing), and teaching presence (design, facilitation and guidance).

Application of the conceptual lenses

The conceptual lenses, affordance theory and the CoI framework, guided all stages of the review. They first informed the design of the data-extraction matrix (spreadsheet), which captured (a) the digital affordances and constraints reported in each study and (b) indicators of social, cognitive, and teaching presence. During analysis, the lenses shaped the guiding questions used to code each article, such as what synchronous, asynchronous, or hybrid formats enabled or made more difficult for doctoral writers, and how interaction, feedback, and identity-related experiences were supported or constrained. In the comparative synthesis, themes were interpreted through this shared frame to explain how different modes of interaction influenced engagement, feedback practices, and doctoral identity work. Importantly, the lenses were used as sensitising concepts rather than a fixed codebook: we also coded inductively for themes not captured by the frameworks and incorporated these into the final thematic structure and model.

Search strategy

We followed a structured, iterative search process. Initial searches were conducted in the Scopus and ERIC databases. These searches were supplemented by targeted searches in Google Scholar and by handsearching the reference lists of influential articles and edited collections on doctoral writing groups and academic writing support. Backward and forward citation searching was also used to identify additional relevant studies.

Search strings combined terms relating to doctoral writing groups, online or digital environments, and modes of interaction. For example, we used combinations of terms such as:

- "doctoral writing group*", "PhD writing group*", "doctoral writing retreat*", "doctoral writing support"
- "online", "virtual", "computer-mediated", "digital", "technology-mediated"
- "synchronous", "asynchronous", "hybrid", "blended"
- "collaborative writing", "peer feedback", "writing community"

Search terms were refined iteratively as our familiarity with the field increased. The search was limited to publications between 2000 and 2025, reflecting the period in which online and hybrid doctoral writing groups have become more established, and to peer-reviewed journal articles and scholarly book chapters published in English.

Eligibility criteria

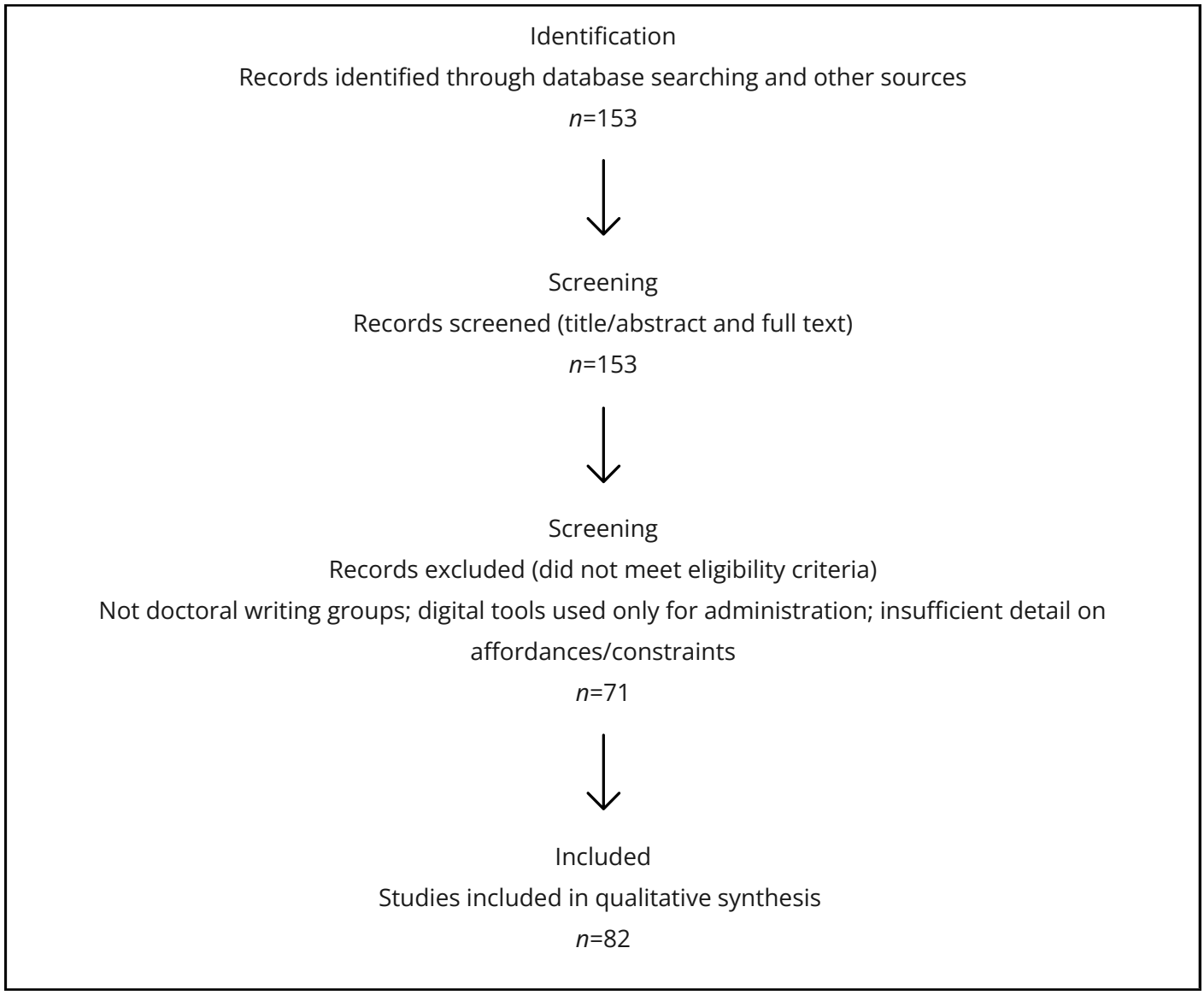
As this was a conceptually informed narrative review, we did not conduct a formal quality appraisal; however, we limited inclusion to peer-reviewed sources and extracted key methodological details. Studies were included if they (a) focused on doctoral writing groups, writing retreats, or structured doctoral writing support that involved peer interaction around writing; (b) examined synchronous, asynchronous, or hybrid online/digital formats (including computer-mediated tools used for interaction, feedback, or collaborative writing); and (c) reported findings relevant to affordances and/or constraints (e.g., interaction, feedback, engagement, accessibility, digital/AI literacies, time management, or identity-related experiences). Studies were excluded if they (a) were not focused on doctoral writers or doctoral writing groups; (b) used digital tools only for administration (e.g., scheduling) without analysing writing-related interaction; or (c) provided insufficient detail to support extraction of format-related affordances/constraints.

Screening and selection procedure

Titles and abstracts were screened against the eligibility criteria, followed by full-text screening of potentially relevant records. Duplicates were removed prior to screening by using the review matrix as a guide. Screening decisions and reasons for exclusion at the full-text stage were recorded in the review matrix to support auditability, and the final set of included studies was agreed upon by the author team through discussion. The screening and selection process is summarised in Table 1, which reports the number of records identified, scree-

-ned, excluded, and included in the qualitative synthesis, together with key exclusion reasons.

Table 1. PRISMA-style summary of study selection.



Data synthesis

We used an inductive thematic narrative synthesis approach, informed by affordance theory and the CoI framework as sensitising concepts. The synthesis proceeded in four steps:

1. Initial coding:

   We conducted open coding of each study, focusing on how synchronous, asynchronous and hybrid formats shaped opportunities and barriers for interaction, feedback, engagement and doctoral identity. Codes were applied to segments describing social, cognitive and teaching processes, as well as to descriptions of specific digital affordances and constraints.

2. Development of thematic categories:

   Related codes were then grouped into broader themes, such as immediacy and social presence, flexibility and access, depth of reflection, peer accountability, digital and AI literacies, time management, and emotional/affective dimensions. The conceptual lenses helped us to interpret these themes in terms of how different formats supported or limited social, cognitive and teaching presence and what kinds of action possibilities they opened up or constrained for doctoral writers.

3. Comparative analysis across formats:

   We compared how each theme manifested across synchronous, asynchronous and hybrid settings. For example, we examined how social presence was fostered or hindered in real-time videoconferencing compared with asynchronous forums, and how different tools afforded or constrained cognitive engagement and the depth of feedback. These comparative steps highlighted tensions (e.g., between flexibility and accountability) and complementarities (e.g., between real-time connection and time for reflection).

4. Construction of the comparative and hybrid framework:

   Drawing on the cross-study and cross-format comparison, we developed the comparative framework presented in Table 2 and the hybrid model in Figure 1. These outputs integrate the thematic findings with the conceptual lenses, showing how particular combinations of synchronous and asynchronous affordances can be intentionally designed to support social, cognitive and teaching presence in doctoral writing groups.

This approach moves beyond reporting isolated case studies to offer a conceptually grounded, comparative account of the affordances and constraints of synchronous, asynchronous and hybrid computer-mediated formats in doctoral writing groups.

Affordances and constraints of digital tools

This section discusses how the integration of digital tools in doctoral writing groups has brought transformative potential, offering diverse affordances while introducing notable constraints. A comparative evaluation of synchronous and asynchronous formats highlights key dimensions that shape collaborative writing dynamics, including immediacy, accessibility and flexibility, as well as digital and AI literacy.

We demonstrate that synchronous tools enhance engagement and collaboration through real-time interaction but may hinder reflection and cause anxiety for some participants. Their reliance on stable internet and fixed scheduling can also limit accessibility and inclusivity. Asynchronous tools offer greater flexibility and support deeper reflection but require strong self-regulation and time management. The effectiveness of both modes depends on participants' digital and AI literacy, an emerging area of research, particularly given the rise of generative AI.

Immediacy

One of the most notable affordances of synchronous tools is their ability to provide real-time interaction and immediacy. Online conferencing platforms enable instantaneous feedback and dynamic discussion, which are vital for addressing misunderstandings, negotiating ideas, and fostering group cohesion (Kirkpatrick, 2019; Lokhtina et al., 2022). These tools enhance social presence by allowing real-time verbal and non-verbal communication, including tone of voice, facial expressions, and gestures, which help build rapport and sustain engagement (Zhong et al., 2022). These features closely mimic face-to-face interactions, making synchronous tools particularly valuable for collaborative writing tasks requiring negotiation, alignment of ideas, and shared decision-making (Kirkpatrick, 2019; Yoon & Leem, 2021). The immediacy provided by these platforms aligns with the CoI framework's emphasis on social and cognitive presence, as it enhances engagement and facilitates rapid knowledge construction (Castelló et al., 2023). The spontaneous and interactive nature of synchronous tools fosters stronger interpersonal relationships, contributing to a sense of academic community within doctoral writing groups.

Furthermore, synchronous tools allow participants to quickly clarify points of confusion and engage in co-authoring processes in real time. The ability to receive real-time feedback ensures that participants can address issues immediately, avoiding potential misunderstandings that may arise from delayed communication (Kirkpatrick, 2019). These tools promote the development of shared meaning and critical engagement, reinforcing collaborative decision-making processes (Kozar & Lum, 2015; Raj Subedi et al., 2022), assuming that all participants engage equally. Unlike asynchronous formats, where responses may be delayed, synchronous tools provide an interactive environment that supports iterative discussion and alleviates feelings of isolation.

The affordance of immediacy also contributes to heightened levels of engagement, social interaction, and motivation. Participants often feel more invested in group discussions when their contributions are acknowledged and addressed in real-time, creating a dynamic and participatory learning atmosphere (see, e.g., Fabriz et al., 2021). For doctoral students, who frequently face the challenges of disconnection during the writing process due to the isolated nature of the PhD (Cutri et al., 2021; Kirkpatrick, 2019), synchronous tools provide critical avenues for maintaining social presence and fostering academic community (Castelló et al., 2023; Coker et al., 2023). This immediacy is particularly beneficial for collaborative writing, as it facilitates shared authorship and iterative text development, making synchronous tools integral to effective CMCW environments in doctoral education.

However, the emphasis on immediacy also introduces several significant constraints that can undermine the effectiveness of synchronous tools in doctoral writing groups. The rapid pace of synchronous interactions may hinder deeper reflection and critical engagement with feedback, as participants often feel pressured to respond quickly, leaving insufficient time to process complex ideas (Kirkpatrick, 2019). This time pressure can lead to superficial contributions and missed opportunities for richer intellectual engagement, particularly in discussions requiring careful deliberation (Castelló et al., 2023). For doctoral students, whose work frequently entails engaging with intricate and multifaceted concepts (Rena et al., 2025), the absence of adequate reflective space can significantly diminish the depth and intellectual rigour of collaborative discussions. In addition, the pressure of synchronous immediacy may heighten anxiety for certain participants, especially those who perceive themselves as less confident in their communication skills (Bahcekapili, 2021). This anxiety can disproportionately affect individuals who require more time to articulate their thoughts, potentially leading to a sense of marginalisation or reluctance to participate fully (Côté & Gaffney, 2021; Kirkpatrick, 2019). Additionally, it is our experience that newer writing group members may not have the confidence to contribute in the same way as a student who has been part of the group for a while. These socio-affective factors highlight the importance of structuring synchronous interactions to ensure inclusivity and cognitive depth, aligning with the principles of the CoI framework. This highlights that achieving and maintaining a strong sense of social presence in these virtual environments requires deliberate facilitation (Raj Subedi et al., 2022).

Accessibility and flexibility

Accessibility is a foundational consideration for the success of digital tools in writing groups. Synchronous tools support real-time feedback exchanges, which are valuable for immediate clarification and collaborative problem-solving (Lokhtina et al., 2022). The effectiveness of these tools, however, cannot be fully realised without addressing accessibility concerns that intersect with infrastructure challenges and participants' digital literacy. For example, synchronous formats enable the immediacy of real-time interactions, but this benefit is often undermined by technical constraints. A critical limitation lies in the reliance on external factors, such as stable internet connectivity and functional digital technologies (Vishnu et al., 2024). Additionally, technical issues, including lag or system crashes, can disrupt the flow of interaction, frustrating participants and interrupting the collaborative process (Lokhtina et al., 2022; Lowenthal, 2023).

These accessibility challenges are particularly pronounced in diverse doctoral cohorts, where disparities in digital infrastructures may further exacerbate inequities in participation (Kruse et al., 2023). Moreover, the reliance on scheduled sessions can pose logistical complexities, particularly for participants navigating time zone differences or balancing competing personal and professional commitments (Lowenthal, 2023). The rigidity of synchronous engagement may inadvertently exclude voices that could otherwise contribute meaningfully, affecting the inclusivity of doctoral writing groups (Kaufhold & Yencken, 2021). This exclusion not only limits individual participation but also narrows the range of perspectives that inform collaborative writing. Such exclusions also compromise the development of the social and cognitive aspects of the CoI framework, limiting opportunities for shared collaborative knowledge constraints and sustained interpersonal connection. To address this, facilitators must adopt flexible approaches that account for the material and temporal constraints shaping engagement in real-time interactions.

In contrast, asynchronous platforms, such as Google Docs, and discussion boards offer more flexible and gener-

-ally accessible alternatives (Castelló et al., 2023; Fabiz et al., 2021). These tools allow participants to contribute at their own pace, making them more inclusive for individuals managing competing demands, such as employment, caregiving responsibilities, or living in different time zones (Bawa, 2016; Watts, 2016). This flexibility can reduce participation barriers that often accompany scheduled, real-time interactions, and it creates opportunities for deeper cognitive engagement through extended periods of reflection and revision (Castelló et al., 2023; DiPasquale & Hunter, 2018). Asynchronous collaboration also supports iterative writing processes, enabling doctoral students to revisit and refine their work over time, which is particularly valuable for complex academic tasks that benefit from critical thinking and sustained attention (Yallop et al., 2021). By enabling thoughtful engagement with feedback, these tools support cognitive presence within the CoI framework, reinforcing deeper analytical and metacognitive processes in doctoral writing.

Nevertheless, the advantages of flexibility are accompanied by challenges that can affect equity and participation. While asynchronous tools can reduce barriers linked to time zones and scheduling, they can also produce uneven engagement when expectations are not explicit, and participation is irregular. Additionally, asynchronous collaboration places greater demands on participants' capacity to navigate platform features (e.g., commenting conventions, version history, and collaborative editing) and to sustain interaction without real-time dialogue, which may reduce connection if a strong sense of community is not deliberately fostered (Broadbent & Poon, 2015). Accordingly, writing groups using asynchronous formats benefit from clearly communicated participation expectations and facilitation practices that support both productive workflow and relational connection.

Digital and AI literacy

Digital literacy is crucial in determining how well participants navigate collaborative tools. Digital literacy here refers to the ability to locate, apply, and share information effectively and ethically in digital contexts (Pretorius, 2018). A lack of familiarity with digital platforms may inadvertently hinder group dynamics and impede progress (Rinekso et al., 2021). Despite its importance, doctoral students' digital literacy remains an underexplored area, with most research focusing on undergraduate or general university populations. While studies on university students broadly demonstrate that digital literacy significantly impacts academic engagement (see, e.g., Getenet et al., 2024; Kwiatkowska & Wiśniewska-Nogaj, 2022; Yuan et al., 2024), there is limited empirical evidence on how doctoral students develop and apply these competencies within their research and academic practices. Improving digital literacy through structured interventions can foster effective engagement with digital platforms (Joseph et al., 2024). To partially address this gap, Paul et al. (2024) investigated doctoral students' information literacy and identified significant gaps in their ability to retrieve and manage scholarly resources effectively. These limitations not only reduce research efficiency but also compromise the rigour of their academic work, underscoring the urgent need for targeted training initiatives that integrate advanced digital literacy skills into doctoral education (Paul et al., 2024). Without such interventions, doctoral students may struggle to navigate the increasingly digitised research environment, placing them at a disadvantage in conducting high-quality scholarly work. This challenge is particularly pronounced in the context of synchronous and asynchronous doctoral writing groups, where digital literacy is crucial for effective participation.

Beyond technological competencies, digital literacy in doctoral education now extends to artificial intelligence (AI) literacy, an emerging yet under-examined area that is reshaping academic engagement. When students engage with collaborative writing tools, they are increasingly presented with automated AI-mediated feedback and generative AI-mediated suggestions for improvement. When thoughtfully integrated, there is significant learning potential related to the diverse and powerful affordances of these technologies, including personalised learning, real-time interactivity, and accessibility (see, e.g., Farrokhnia et al., 2023; Wang et al., 2024).

However, the empirical evidence based on AI-mediated feedback in doctoral writing groups remains emerging and context-dependent, and findings should be interpreted cautiously given variations in institutional policy, access to reliable infrastructure, and differences in disciplinary writing norms (Jin et al., 2025). Practical implementation also raises challenges related to data privacy, academic integrity expectations, uneven access to tools, and the risk of over-reliance on automated feedback, which may shift influence towards platforms and institutional rule-setting rather than writers' agency (UNESCO, 2025; Zhai et al., 2024). This also necessitates a le-

-vel of AI literacy from both the students and the writing group facilitator. AI literacy can be defined as understanding "how to communicate effectively and collaboratively with generative AI technologies, as well as evaluate the trustworthiness of the results obtained" (Pretorius, 2023, T3). Pretorius and Cahusac de Caux (2025) also emphasise that AI literacy should be conceptualised as more than just functional proficiency with AI tools; rather, it must include the ability to critically evaluate, ethically engage with, and strategically integrate AI-generated content into research and writing practices.

With intentional integration and appropriate scaffolding, AI tools can meaningfully advance doctoral students' scholarly development. For example, a recent study by Pretorius et al. (2025) highlights the role of AI literacy in promoting epistemic justice, particularly for students from linguistically and epistemically marginalised backgrounds who can use generative AI to navigate barriers in traditionally Anglophone-centric academic spaces. This study demonstrated how generative AI helped doctoral students in engaging more deeply with scholarly communities, fostering a shared academic identity, and reinforcing their sense of belonging within collaborative spaces of knowledge creation (Pretorius et al., 2025). However, scholars also warn that without structured AI literacy training and reflexive engagement with generative AI tools, educators may inadvertently reinforce existing inequalities, such as a widening digital divide and the reinforcement or exacerbation of societal stereotypes (Eacersall et al., 2025). This underscores a pressing need to reframe digital literacy in doctoral education to include AI literacy as a critical component, especially as AI increasingly mediates engagement, feedback, collaboration, and knowledge exchange in both synchronous and asynchronous doctoral writing groups.

While some studies highlight potential benefits for access and participation, other scholarship cautions that AI systems can introduce bias, opacity, and uneven accountability, and that benefits are not distributed equally without explicit safeguards and critical pedagogy (UNESCO, 2025). Across this review, evidence is strongest for the role of digital competence in enabling participation in online writing group practices (Joseph et al., 2024; Paul et al., 2024); whereas claims about AI-mediated feedback and AI literacy remain promising but nascent (Farrokhnia et al., 2023; Pretorius, 2023; Pretorius et al., 2025; Wang et al., 2024), requiring further empirical work across disciplines, program types, and institutional contexts.

Balancing structure in synchronous and asynchronous formats

The previous section highlights the critical need to balance structure and flexibility when integrating synchronous and asynchronous formats into doctoral writing groups. Synchronous sessions introduce a time-bound structure that promotes real-time accountability, sustains collaborative momentum, and enhances cognitive presence, a key element of the CoI framework. The opportunity to synchronously negotiate writing decisions, clarify ideas, and receive immediate feedback fosters shared understanding and strengthens group cohesion. However, the logistical demands of real-time participation, such as scheduling across time zones or managing personal and professional commitments, can unintentionally exclude some participants (see, e.g., Lowenthal, 2023). Conversely, asynchronous tools like Google Docs afford participants the flexibility to contribute on their own terms, supporting inclusivity and sustained reflection. Yet, without deliberate structure, asynchronous engagement can risk reduced accountability, delayed progress, and disengagement (see, e.g., Ishtaiwa & Aburezeq, 2015).

Additionally, self-motivation and time management have emerged as key factors influencing participation and engagement in both synchronous and asynchronous formats (Kirkpatrick, 2019). While the flexibility offered by these environments is an advantage, it can also lead to procrastination if not effectively managed. Structured activities, such as goal setting and progress reviews, have been shown to help participants stay accountable and maintain momentum (Raj Subedi et al., 2022). In this context, targeted support and training become essential for fostering engagement and productivity. Workshops, for instance, can serve as powerful interventions; when designed to address self-regulation, they provide participants with practical tools to enhance their writing productivity (Vincent et al., 2023). Furthermore, as Bottomley and Bourgeois (2022) demonstrate, workshops that facilitate meaningful interactions between students and faculty not only build participants' confidence and competence in academic writing but also contribute to a sense of community and shared purpose within writing groups. By integrating these aspects, virtual writing groups can more effectively address individual challenges w-

-hile promoting collective success.

To maximise the pedagogical affordances of both formats, facilitators must, therefore, adopt strategic design principles that intentionally bridge the gap between structure and autonomy. Asynchronous engagement can be scaffolded through shared timelines, regular check-ins, and peer accountability mechanisms to maintain momentum. Meanwhile, synchronous interactions should be purposefully designed with clear agendas, focused breakout tasks, and structured feedback cycles to enhance learning while respecting participants' scheduling constraints (see, e.g., Naidoo et al., 2023; Richardson et al., 2017). Crucially, the tension between structure and flexibility should not be viewed as a binary, but as an opportunity to design hybrid practices that are both inclusive and pedagogically effective. Beyond logistical considerations, this balance also influences the social dimensions of collaborative writing, where maintaining interpersonal connection and a sense of academic community is central to the success of doctoral writing groups. Effective leadership within doctoral writing groups plays a key role in making this a reality by fostering trust, structuring engagement, and ensuring inclusivity (Chakraborty et al., 2021; Hradsky et al., 2022; Lokhtina et al., 2022). Leaders who facilitate discussions, set clear expectations, and actively promote equal participation contribute to stronger group cohesion and more meaningful engagement (Chakraborty et al., 2021; Hradsky et al., 2022; Lokhtina et al., 2022). Intentional trust-building strategies, such as structured introductions, collaborative goal-setting, and periodic check-ins, can also help sustain social presence over time.

Ultimately, both synchronous and asynchronous formats require deliberate strategies to foster social presence, highlighting its importance as a key dimension of successful virtual writing groups. Without sufficient attention to social presence, the effectiveness of such groups may be diminished, as participants may struggle to feel connected to their peers or invested in group objectives. By integrating strategies to enhance leadership, intentional engagement, and participant self-management (especially with the support of experienced facilitators), virtual writing groups can create more supportive and productive environments, enabling participants to thrive in both formats.

Transferability and contextual considerations

Although this review synthesises doctoral writing groups in general, the included studies do not consistently report disciplinary field, program type (e.g., professional versus research doctorate), or institutional characteristics in a way that supports robust cross-context comparison. As a result, our findings should be interpreted as identifying format-level affordances and constraints that may be enacted differently depending on local conditions (Garrison et al., 1999; Garrison et al., 2001). For example, participation patterns and the relative value of synchronous versus asynchronous engagement may vary with candidates' enrolment intensity (full-time/part-time), cohort composition, access to digital infrastructure, and the degree of facilitation support provided (Naidoo et al., 2023; Richardson et al., 2017). Where doctoral candidates balance employment, caregiving responsibilities, or distributed time zones, flexibility may become a more salient affordance, while maintaining momentum may require more explicit expectations and facilitation to sustain engagement (Maher et al., 2014; Smith, 2020). Conversely, in contexts with stable schedules, strong cohort identity, and institutional support for peer learning, synchronous interaction may be easier to sustain and can strengthen social presence and timely feedback, as emphasised within CoI–informed analyses of online scholarly communities (Garrison et al., 2000; Garrison et al., 2010). Future research would benefit from more systematic reporting of contextual variables so that transferability across disciplines, program structures, and institutional settings can be examined directly.

We have constructed the following table to illustrate the comparative dimensions of synchronous and asynchronous formats in doctoral writing groups. We have found through our review of the literature and our personal experiences as writing group members and facilitators. By integrating key insights from the literature, Table 2 also illustrates how these two modes influence collaboration, engagement, and productivity in different ways. The structured comparison underscores the strengths and limitations of each format, offering a nuanced perspective on their applicability in doctoral student writing contexts.

Table 2. Comparative analysis of synchronous and asynchronous formats in doctoral writing groups.

Criteria	Synchronous Format	Asynchronous Format	Literature
Immediacy	Supports immediate feedback, negotiation, and co-construction; fosters engagement and collaboration.	Delayed but supports thoughtful, deliberate reflection and revision.	Castelló et al. (2023); (2019); Lokhtina et al. (2022); Rena et al. (2025); Yoon & Leem (2021)
Accessibility and Flexibility	Requires stable internet, functional technology, and scheduling across time zones; less flexible; may exclude some participants.	More accessible; highly flexible; accommodating diverse schedules and enabling participation at one's own pace.	Lokhtina et al. (2022); Lowenthal (2023); Vishnu et al. (2024); Kruse et al. (2023); Kaufhold & Yencken (2021); Castelló et al. (2023)
Digital Literacy	Requires proficiency with real-time communication platforms to avoid technical disruptions.	Requires ability to navigate collaborative platforms (e.g., Google Docs); challenges for those unfamiliar with tools.	Rinekso et al. (2021); Paul et al. (2024); Joseph et al. (2024); Getenet et al. (2024); Yuan et al. (2024)
AI Literacy	Needs facilitation and participant awareness to critically engage with AI-mediated features in live settings.	Requires training and intentional design to embed and ethically use generative AI tools.	Pretorius & Cahusac de Caux (2025); Pretorius et al. (2025); Farrokhnia et al. (2023); Wang et al. (2024)
Social Presence	High real-time cues (tone, expression) support trust, group identity, and community.	Lower absence of real-time cues can reduce connection; may require effort to sustain community.	Kirkpatrick (2019); Yoon & Leem (2021); Castelló et al. (2023); Coker et al. (2023)
Feedback Quality	Immediate but potentially superficial due to time pressure; may lack depth.	Detailed, reflective feedback; supports metacognition and revision.	Castelló et al. (2023); Lokhtina et al. (2022); Raj Subedi et al. (2022)
Time Management	Requires punctuality and external structure; promotes accountability.	Relies heavily on self-regulation, planning, and motivation.	Bottomley & Bourgeois (2022); Raj Subedi et al., (2022); Ishtaiwa and Aburezeq (2015)
Cognitive Engagement	Promotes engagement through real-time discussion, but may limit deeper reflection due to immediacy.	Supports deep cognitive processing through extended reflection and iterative revision	Castelló et al. (2023); Rena et al. (2025); DiPasquale & Hunter (2018)
Anxiety / Confidence	May heighten anxiety, especially for less confident or second-language users.	Reduces performance pressure but may cause disengagement without regular check-ins.	Bahcekapili (2021); Côté & Gaffney (2021); Kirkpatrick (2019)

Hybrid approaches: Bridging the best of synchronous and asynchronous formats

Given the distinct affordances and constraints of synchronous and asynchronous tools, hybrid models emerge as a compelling pedagogical solution for doctoral writing groups. Hybrid models, as shown in Figure 1, strategically integrate the immediacy and interactivity of synchronous methods with the flexibility and reflective depth of asynchronous communication, creating a balanced and adaptable framework for collaboration. By leveraging the affordances of both modes, hybrid approaches support knowledge co-construction, facilitate structured feedback exchange, and foster sustained engagement over time.

Figure 1. Harnessing hybrid potential: Intersecting affordances for inclusive and reflexive learning in doctoral writing groups.

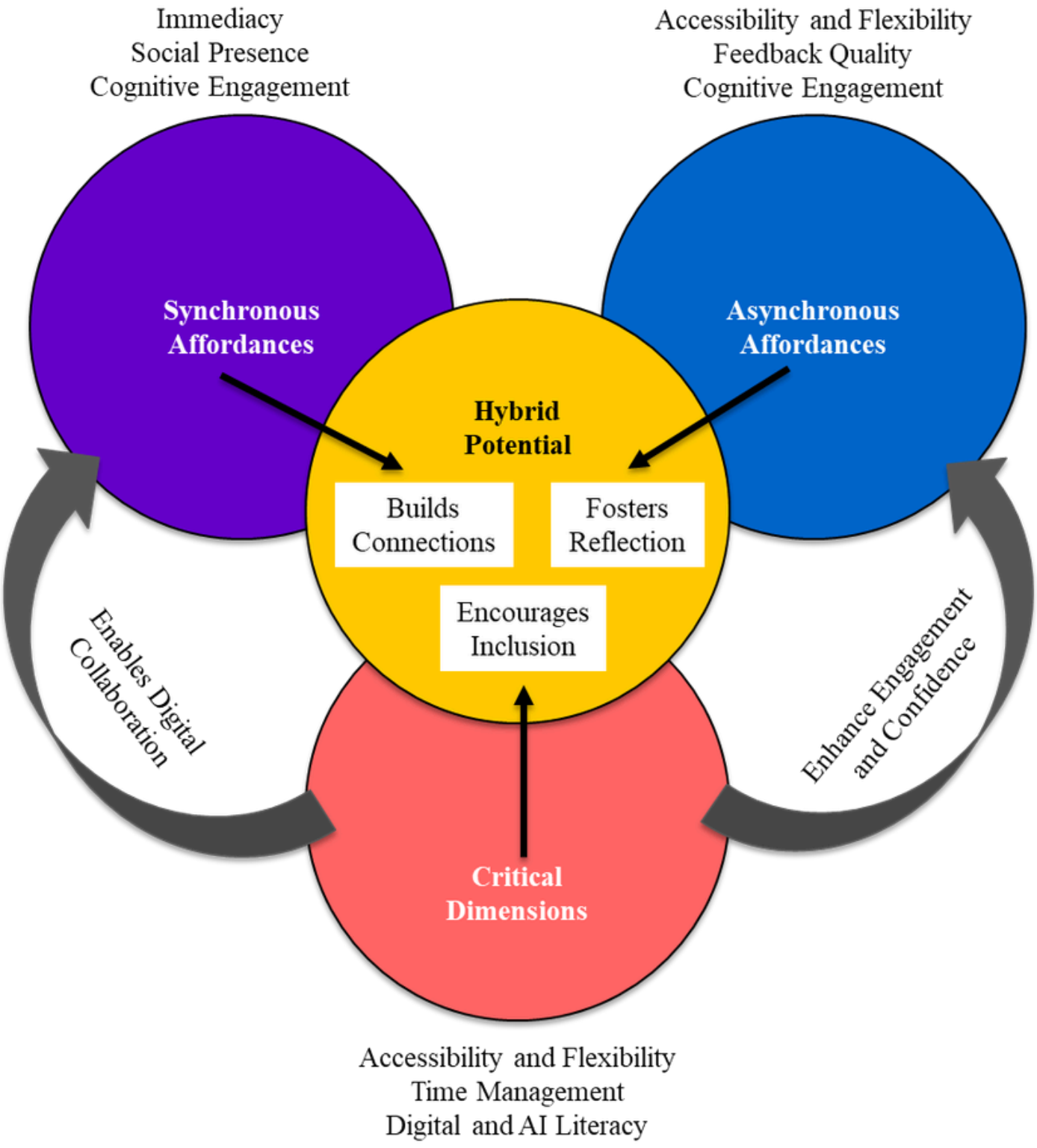


Figure 1 illustrates the dynamic interplay between synchronous and asynchronous affordances, highlighting their convergence within a central zone of hybrid potential. The figure demonstrates how each modality contributes distinct strengths: synchronous affordances support the building of connections through immediacy and social presence, while asynchronous affordances promote reflection by providing space for thoughtful engagement and sustained contemplation. Critical dimensions such as time management and digital and AI literacy underpin our hybrid model, intended to support inclusive participation. At the intersection of these lies the hybrid learning space, which harnesses both immediacy and reflection to create more inclusive, engaging, and adaptive educational experiences when supported by intentional design and facilitation. The arrows depict the flow of influence and mutual reinforcement between the components, underscoring the importance of designing learning environments that integrate these dimensions holistically. This model emphasises that when educational practices intentionally balance synchronous and asynchronous elements with critical pedagogical concerns, they can more effectively meet the diverse needs of learners in writing groups. This integrated model aligns well with the CoI framework, reinforcing cognitive, social, and teaching presence across both interaction modalities. Chakraborty et al. (2021) have previously recommended embedding hybrid models into doctoral programs to mitigate geographical and time-zone barriers, support remote and international students, and enhance doctoral students' sense of agency. This alignment with the CoI framework ensures that cognitive, social, and teaching presence are reinforced across multiple interaction modalities. By combining synchronous immediacy with asynchronous depth, hybrid models enable a more flexible and inclusive collaborative environment, which can broaden opportunities for meaningful contribution across diverse schedules, locations, and participation preferences.

We argue that hybrid approaches not only build academic confidence and foster a sense of agency among doctoral students but also facilitate collaborative knowledge production. By combining the complementary strengths of synchronous and asynchronous communication tools, hybrid models foster deeper engagement and structured support for doctoral students navigating complex tasks. Li et al. (2025) emphasise the critical role of hybrid learning in enhancing student engagement and supporting the development of learner autonomy, both of which are crucial for maintaining long-term motivation and participation in collaborative academic settings. Similarly, Singh et al. (2021) explore hybrid learning models in higher education, highlighting the effective integration of synchronous and asynchronous tools to foster engagement, collaboration, and interaction. While their research focuses broadly on the challenges and opportunities of hybrid learning during the pandemic, the strategies they propose, such as leveraging diverse digital tools and fostering social, cognitive, and teaching presence, are directly applicable to virtual doctoral writing groups. For instance, Singh et al. (2021) highlight the need for appropriate infrastructure and professional development to ensure the successful implementation of hybrid models, a consideration particularly critical for doctoral programs. The principles behind a suitably enabled and supported hybrid approach enhance academic confidence, provide structured support, and promote interaction and productivity, making the approach invaluable for doctoral students navigating complex writing tasks.

Implications for practice

The findings of this review carry significant implications for the design and facilitation of doctoral writing groups, particularly in light of the growing adoption of hybrid models that integrate synchronous and asynchronous elements. While hybrid formats are often promoted as offering a complementary combination of synchronous and asynchronous affordances, this assumption requires critical examination. Hybrid approaches do not inherently ensure inclusivity or effectiveness; their success depends on the intentionality of their design and the degree to which they support equitable engagement among doctoral students.

For doctoral students, hybrid formats require navigating multiple modes of participation and communication, often without explicit guidance on how to manage the associated cognitive and emotional demands. Cognitive presence in hybrid environments is not only about processing content, but also about managing cognitive load, digital fragmentation, and delayed responses (Skulmowski & Xu, 2022). Similarly, doctoral students are expected to cultivate social presence through both real-time interaction and asynchronous engagement. While synchronous sessions may offer relational immediacy, students who require more time to formulate their thoug-

-hts may struggle to participate fully in fast-paced discussions (Mochizuki, 2022). In asynchronous formats, opportunities may be more flexible but still require careful scaffolding to prevent disengagement.

For educators and facilitators, implementing hybrid writing groups involves more than technical competence or familiarity with tools. It requires a deep understanding of how learning presence, power, and participation intersect in CMC environments. In hybrid doctoral writing groups, teaching presence must be sustained across synchronous and asynchronous modalities, demanding pedagogical strategies that ensure coherence and continuity. Educators also need to develop strategies that do not simply alternate between synchronous and asynchronous tasks. Instead, they must purposefully integrate both modes in ways that enable meaningful and reflective student contribution. This includes designing feedback loops that value asynchronous deliberation as much as real-time commentary, thereby supporting students with slower processing styles or those working in additional languages.

This review not only draws on the CoI framework to examine doctoral writing groups but also advances its theoretical development by critically assessing its application in hybrid learning environments. While CoI offers a valuable lens for understanding cognitive, social, and teaching presence, it does not fully account for the distinctive dynamics introduced by hybrid formats where synchronous and asynchronous interactions intersect in complex ways. The findings of this review indicate that the enactment of presence in hybrid doctoral writing groups is shaped by additional factors such as time-delayed feedback, uneven participation across modalities, and the potential marginalisation of participants in high-paced synchronous exchanges. In doing so, this review extends the CoI framework by foregrounding equity-related considerations and emphasising the need for inclusive, modality-sensitive approaches to supporting academic development in hybrid settings.

This review also calls into question some of the underlying assumptions commonly found in doctoral education, particularly regarding what constitutes presence in collaborative academic environments. Traditional models of doctoral education often privilege physical co-location as a prerequisite for meaningful engagement, overlooking the evolving nature of presence in digitally mediated settings. However, our analysis as well as our lived experiences of participating and facilitating both in-person and virtual writing groups suggest that online presence (either synchronous or asynchronous presence, that is) can be equally as significant as physical presence in terms of learning and academic development. Additionally, offering virtual spaces acknowledges the complexities and intersectionality of doctoral students' lived realities, contributing to a more inclusive educational environment. This redefinition of presence acknowledges that connection, collaboration, and support are not confined to shared physical spaces but can be powerfully cultivated in well-facilitated digital environments.

We, therefore, argue for a more refined and expanded understanding of presence that accounts for how digital, social, and institutional conditions interact to shape doctoral students' levels of engagement, their development of academic identity, and their evolving sense of belonging. These findings underscore the importance of designing writing groups that intentionally foster presence across modalities, ensuring that participants feel seen, heard, and valued, regardless of the format. In doing so, this review highlights the need for doctoral education to move beyond binary conceptions of "online" versus "in-person" and to embrace the nuanced realities of presence as they play out in hybrid scholarly spaces.

Conclusion

This literature review has critically examined the affordances and constraints of synchronous and asynchronous formats in doctoral writing groups, highlighting their respective contributions to collaborative writing, reflective practice, and knowledge co-construction. The findings reveal that synchronous formats enhance immediacy, real-time feedback, and social presence, fostering dynamic engagement and strengthening academic community ties among doctoral students. However, they also introduce logistical and cognitive challenges, including time-zone constraints, scheduling difficulties, and the heightened cognitive load associated with rapid interaction. Such fast-paced exchanges can inadvertently privilege more confident or quick-thinking participants, contributing to a sense of marginalisation among those who require more time to formulate their ideas. This dynamic may lead to reduced participation, feelings of exclusion, or a reluctance to contribute, particularly for st-

-udents whose language proficiency, confidence, or cultural norms make rapid interaction more challenging. Conversely, asynchronous formats afford greater flexibility, enabling reflective contributions, iterative revisions, and equitable participation. Yet, their effectiveness is contingent on self-regulation, structured facilitation, and sustained engagement strategies to mitigate challenges related to social presence and interaction gaps.

The comparative analysis of these two modalities underscores the complex interplay of factors shaping doctoral writing groups. The review demonstrates that neither synchronous nor asynchronous formats alone sufficiently address the diverse needs of doctoral students. Instead, a hybrid approach that strategically integrates the strengths of both formats offers the most effective and comprehensive support for doctoral writing groups. This alignment with the CoI framework ensures that cognitive, social, and teaching presence are reinforced across multiple interaction modalities, creating a more structured yet flexible learning environment. By combining the immediacy and interactivity of synchronous engagement with the reflective depth and flexibility of asynchronous interaction, hybrid models mitigate the inherent limitations of each individual format, fostering a more balanced and sustainable approach to collaborative writing. Moreover, hybrid formats may reduce the risk of marginalisation by offering alternative avenues for expression and engagement, particularly when participation structures are intentionally designed to support equitable contribution.
Furthermore, structured facilitation, intentional scaffolding, and digital literacy development are pivotal in maximising the benefits of hybrid approaches. Effective leadership, clear goal-setting, and social presence strategies contribute to fostering a sense of belonging, equitable participation, and sustained engagement in virtual writing groups. To make these implications actionable, we recommend that facilitators and institutions design doctoral writing group workshops with three core components: (a) explicit participation structures (e.g., agreed turn-taking norms, rotating roles, and clear feedback protocols) to support equitable contribution; (b) a predictable hybrid rhythm (e.g., brief synchronous goal-setting and feedback sessions paired with structured asynchronous drafting and peer response cycles supported by timelines and check-ins); and (c) targeted scaffolds for self-regulation (e.g., weekly goals, accountability pairs, and prompts that guide reflective peer feedback).

As digital technologies continue to evolve, future research should investigate how emerging tools such as AI, adaptive learning platforms, and intelligent writing assistants can further enhance collaborative doctoral writing experiences. Where AI tools are used, we recommend embedding AI literacy development that includes (a) how to collaborate effectively with generative AI (e.g., prompt practices aligned with writing goals), (b) how to evaluate and verify outputs (e.g., checking accuracy, sources, and bias), and (c) how to use AI ethically and safely (e.g., attribution expectations, privacy and data handling, and alignment with institutional integrity policies).

Additionally, future empirical studies could examine: (1) the effects of different hybrid sequencing patterns (e.g., synchronous goal-setting followed by asynchronous drafting and peer feedback) on doctoral students' writing development and sustained participation across full-time and part-time cohorts; (2) which facilitation strategies (e.g., structured turn-taking, pre-writing prompts, or asynchronous preparation) are most effective in reducing participation inequities during synchronous sessions; (3) the impact of an AI-literacy intervention on doctoral writers' agency, confidence, and uptake of feedback in hybrid writing groups; and (4) how disciplinary writing norms and program structures (professional versus research doctorates) shape the perceived value of synchronous versus asynchronous engagement over time.

Ultimately, this review advocates for the intentional and evidence-based design of doctoral writing groups that harness the affordances of both synchronous and asynchronous formats while addressing their inherent challenges. By adopting a hybrid, pedagogically grounded approach, institutions and facilitators can create more inclusive, engaging, and effective writing environments that support doctoral students in developing advanced writing proficiency, fostering academic resilience, and navigating the complexities of scholarly communication in an increasingly digital academic landscape.

Statements, Declarations, and Data Availability

Dr Elham (Ellie) Manzari contributed to the investigation, data curation, formal analysis, and writing (both draft and final version) of this study. Dr Michael J. Henderson contributed to the conceptualisation, resources, supervision, and writing (both draft and final version) of this study. Dr Lynette Pretorius contributed to the conceptualisation, investigation, project administration, resources, supervision, and writing (both draft and final version) of this study.

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