






Exploring views and experiences of faculty members' participation in an asynchronous online program: Using a micro-learning format and CoP framework

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ABSTRACT



Traditional teaching methods in higher education often fall short of meeting the diverse needs of learners, particularly in remote or asynchronous settings. Addressing this gap, this qualitative case study investigates how a six-module asynchronous online professional learning program can support the integration of active learning strategies using micro-learning and a Community of Practice (CoP) framework. Conducted at a higher education institution, the study involved six faculty members from diverse academic backgrounds. Data were gathered through semi-structured interviews, lesson observations, discussion board content, and participant reflections. Content analysis revealed that the flexibility and accessibility of asynchronous learning coupled with micro-learning segments. This study addresses a critical need for practical insights into professional learning programs that effectively implement active learning in non-traditional educational environments. The findings suggest that such programs should incorporate structured support mechanisms, clear guidelines, and diverse content formats to enhance motivation and mitigate cognitive overload, particularly in remote learning contexts.

KEYWORDS

Asynchronous learning; learning technologies; active learning strategies; micro-learning; professional learning; community of practice

Introduction

Active learning is widely acknowledged for its pedagogical value, yet it lacks a universally accepted definition (Freeman et al., 2014). Collins and O'Brien (2003) conceptualise it as engaging students in tasks that promote critical thinking, practice, and reflection. Empirical studies consistently demonstrate that active learning improves academic performance and is more effective than traditional lectures (Theobald et al., 2020). Moreover, student satisfaction is notably higher when instructors employ active learning strategies (Sahito et al., 2025). Despite its documented benefits, integration of active learning remains inconsistent in higher education, particularly within online and asynchronous modalities.

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The increasing diversity of higher education learners, including international and remote students, underscores the need for innovative online pedagogies (Means et al., 2014). Although institutions have promoted active learning through physical learning spaces and teaching centres, there is a persistent gap in professional development tailored to online and asynchronous delivery (Aga, 2023). Faculty face challenges accessing flexible, scalable training due to workload constraints, with traditional formats proving impractical (Gao et al., 2022). While online learning provides flexibility (Trust & Whalen, 2020), its potential to support active learning remains underexplored (Wang & Hu, 2025). Active learning techniques, once introduced through faculty development programs, require effective transfer of learning to actual classroom settings. Research on the transfer of learning emphasises how knowledge acquired in one context can influence behaviour in another (Cilliers & Tekian, 2016). Structured support is essential for the successful transfer of active learning strategies (Elliott et al., 2025).

Micro-learning offers a promising alternative by delivering concise, engaging content that supports retention and multimodal instruction (Sumarni & Salsabila, 2023). It also enhances motivation and autonomy (Kohnke & Moorhouse, 2024). When paired with Community of Practice (CoP) models, micro-learning may strengthen faculty engagement with active learning, though further research is needed (Camarao & Din, 2023).

Thus, it is significant to investigate how asynchronous online professional development can effectively train faculty members to integrate active learning strategies into their teaching practices within online and asynchronous learning environments. The present study explores the integration of active learning strategies, specifically micro-learning and the CoP framework, into asynchronous online professional learning programs. It seeks to answer the following research questions:

- RQ1: What are the views and experiences of faculty members regarding a professional learning module delivered through a micro-learning-based online course platform?
- RQ2: What are the views, observations, and experiences of faculty members regarding a professional learning module to help promote active learning strategy use?
- RQ3: What are the views and experiences of faculty members regarding a professional learning module delivered within the CoP framework through collaborative inquiry?
- RQ4: What active learning-promoting behaviours of the faculty can be observed in their teaching following the training?

This research is crucial as it addresses the pressing need for innovative teaching approaches in higher education, where traditional methods often fail to meet the varied needs of learners. This training is aimed at faculty members from various departments with diverse backgrounds, encompassing a range of academic specialisations and teaching approaches. By examining their views and experiences in an asynchronous online professional learning program, this study contributes to the ongoing conversation about how to effectively implement active learning in non-traditional educational environments. Furthermore, it offers practical insights into the challenges and benefits of

leveraging micro-learning and CoP frameworks to enhance professional learning. These insights are vital as educators worldwide adapt their teaching practices to remote learning environments (Chellaraj, 2024).

Literature review

This literature review explores key elements of active learning, including asynchronous online professional learning, micro-learning, and CoP. Furthermore, it examines both the challenges and enabling factors in implementing active learning strategies and reviews how these approaches are integrated into asynchronous online platforms.

Active learning and asynchronous online professional learning

Constructivist principles, the importance of prior knowledge, and the social aspects of learning, are central to active learning (Cooperstein & Kocevar-Weidinger, 2004). Various strategies, such as collaborative, problem-based, and case-based learning, are commonly used in active learning to enhance critical thinking and problem-solving skills (Prince, 2004). However, the adoption of active learning faces challenges. Resistance can arise from both students and instructors, with students often favouring passive learning methods and instructors hesitant to adopt unfamiliar teaching techniques (Andrews et al., 2020).

With the expansion of online learning, there has been increased interest in applying active learning strategies to asynchronous environments. Asynchronous learning allows learners to access materials, engage in tasks, and participate in discussions at their convenience. This flexibility is especially beneficial in professional learning settings for adult learners who often juggle multiple responsibilities (Edwards, 2024). Technological tools such as video-based learning and interactive content have been found to improve knowledge retention and engagement in these settings (Ou, 2024). By using these tools, educators can design more effective professional learning programs that incorporate active learning strategies, even in asynchronous formats (Aponte, 2022). Asynchronous learning environments can lack real-time feedback and interaction, which are key to active learning. However, technologies like video discussions, interactive quizzes, and collaborative platforms can enhance engagement and make learning more dynamic (Koller et al., 2013).

Faculty development training must effectively support the transfer of learning – applying training to real-world teaching – to be successful. Key factors include well-designed content, ongoing support, and a focus on specific skills like problem-based or competency-based education (Gabr, 2024). Digital tools and multimodal strategies further enhance this transfer (Elliott et al., 2025). While social support helps, intrinsic motivation and training relevance are more impactful, institutional barriers like time constraints remain challenges, highlighting the need for strategic planning (Johnson & Johnson, 1998).

Micro-learning in professional learning

Micro-learning is a growing trend in education that aligns with active learning principles by delivering content in short, focused segments. This approach breaks down complex information into manageable pieces that fit easily into learners' daily routines (Suyo-Vega et al., 2023). Micro-learning is particularly effective in asynchronous environments, where learners may have limited time for professional learning. Studies show that micro-learning improves knowledge retention and engagement by reducing cognitive load and making learning more accessible (Alias & Razak, 2024). Additionally, it allows learners to immediately apply new knowledge, reinforcing their learning through real-world practice (Monib et al., 2024). Research supports the efficacy of micro-learning in various educational contexts, particularly in online professional learning programs for educators (Fan et al., 2024).

Community of practice and active learning

Community of practice (CoP) is another key aspect of active learning, especially in professional learning contexts. As Wenger (2011) notes, CoP is a group of individuals with a shared interest or profession who learn collectively through regular interaction. This model aligns with constructivist theories, emphasising learning as a social process. In asynchronous online settings, CoPs can manifest as virtual discussion boards or collaborative projects where participants share experiences, provide feedback, and reflect on their learning (Tu, 2004). Research shows that CoPs enhance learner engagement and motivation by fostering a sense of connectedness (Harland, 2020). Its collaborative nature also helps learners implement active learning strategies more effectively, as they are encouraged to engage in discussion, reflection, and problem-solving with their peers. Incorporating active learning strategies into asynchronous online professional learning programs can greatly enhance their effectiveness. By combining micro-learning with CoPs, educators can create experiences that are both flexible and engaging (Allela et al., 2020). These strategies enable learners to engage with content at their own pace while benefiting from the social and collaborative aspects of a community of practice.

Methodology

The methodology of this study followed an in-depth qualitative case study approach, as it aimed to explore the views and experiences of faculty members participating in an asynchronous online professional learning program. The qualitative case study was deemed appropriate for uncovering the intricate processes of learning in a natural context, utilising multiple data collection instruments for a comprehensive analysis (Yin, 2017). This approach is particularly suited to educational research, where the focus is on the process rather than solely the outcomes (Marshall & Rossman, 1995). This methodological approach is rooted in a constructivist epistemology, which posits that knowledge is actively constructed rather than passively received. Ontologically, this study aligns with interpretivism, acknowledging that reality is subjective and shaped by individuals' experiences. These philosophical foundations inform the study's qualitative approach,

emphasising the meaning-making processes of participants. The study was divided into two phases:

- (1) **Phase I** was focused on the needs analysis, design, and learning of the professional learning program. It involved expert evaluations and iterations of the training design. The design process followed a developmental research methodology (Richey & Klein, 2014), ensuring that the training content was grounded in empirical evidence and aligned with the participants' needs.
- (2) **Phase II** involved the implementation of the professional learning program and the data collection, analysis, and reporting of the qualitative case study. The primary research questions addressed in this phase included participants' experiences with the online micro-learning course, the active learning strategies, and the CoP framework, as well as their ability to transfer these strategies into their own teaching practices.

Participants and sampling

Six faculty members from a higher education institution participated in the study, selected through voluntary response to an open email call. Their diverse backgrounds contributed varied perspectives on integrating active learning. Participant identities were anonymised as P1–P6. [Table 1](#) presents an overview of their demographic and professional profiles.

The study was conducted at a highly selective, tuition-free private university in Eastern Europe, emphasising humanities, multilingual education, and comparative learning. Renowned for academic excellence, intellectual independence, and research-driven innovation, the institution's multicultural environment provides an ideal context for faculty professional development and the advancement of pedagogical practices.

Table 1. Participants.

Participant	Age	Nationality	Years of Teaching Experience	Field of Expertise	Previous Training in Active Learning	Additional participant details
P1	35	South African	6	Sociology	No	Familiar with online teaching, no prior use of online learning platforms.
P2	37	American	8	Computer Engineering, Sociology	No	Skilled in coding and programming; faculty member for six years.
P3	32	Turkish	6	Sociology	No	Incorporates educational technology; eager to enhance teaching skills.
P4	36	French	5	Philosophy of Religion Studies	No	Has not attended previous teaching enhancement workshops.
P5	40	Turkish	7	History	Yes	Interested in continuous professional learning.
P6	43	Azerbaijani	8	Psychology	Yes	Enjoys innovative teaching methods.

Table 2. Data collection instruments.

Research Questions (RQs)	Data Collection Instruments	Data Analysis Method
RQ1	Faculty Interviews (Micro-learning-based online course)	Content Analysis
RQ2	Faculty Interviews (Active Learning) + Discussion Boards (Active Learning)	Content Analysis
RQ3	Faculty Interviews (CoP) + Discussion Boards (CoP)	Content Analysis
RQ4	Lesson Observation Forms (video-recorded) + Participant Reflections on their teaching performance	Content Analysis

Data collection tools

Multiple data collection tools were employed in this study to capture the full spectrum of participants' views and experiences. These included interviews, lesson observations, discussion board content, and participant reflections. Table 2 summarises the tools used and their relation to the research questions.

Semi-structured interviews

Three sets of semi-structured interviews were conducted with participants: one set focused on their experiences with the micro-learning course, the second on their experiences with active learning strategies, and the third on their experiences with the CoP framework. Follow-up interviews were conducted with two participants to assess the long-term adoption of active learning strategies. These interviews were essential for capturing detailed personal insights into how participants experienced the training program and how they applied what they learned in their teaching.

Lesson observations

Lesson observations were carried out to assess the practical application of active learning strategies by the participants in their classrooms. Each participant was observed in class, and their lessons were video recorded for subsequent expert review. Observations focused on the alignment of learning outcomes with activities, the selection and implementation of active learning strategies, interaction patterns, and student reflection. A follow-up lesson observation was conducted five weeks after the initial observation to assess the sustained use of active learning strategies.

Discussion boards

Discussion boards on the online learning platform provided a space for participants to engage in collaborative learning and reflect on their experiences. Each module included a discussion board where participants shared their experiences, lesson plans, and responses to peer feedback. The content of these discussions was analysed to identify patterns of engagement and adoption of active learning strategies within the CoP framework.

Participant reflections

Participants were asked to complete a teaching reflection form following each lesson observation. These reflections allowed participants to self-assess their implementation of

active learning strategies, providing a secondary source of data to complement the researchers' observations. Reflections were compared with lesson observation data to ensure objectivity and triangulate the findings.

Data analysis

In this study, content analysis was chosen due to the large number of data sources (six in total) and the large datasets involved, which needed to be analysed across four research questions. The goal was not to identify broad, overarching themes, as in thematic analysis, but to conduct a detailed examination of each dataset, which varied in its contextual nature (e.g. micro-learning, active learning, CoP, faculty development, asynchronous learning). Content analysis provided a suitable framework for identifying specific patterns and making comparisons across different text sources (Vaismoradi et al., 2013). This method allowed us to avoid the limitations of broad, generalised themes, and instead focus on identifying the prevalence of key themes in a way that aligned with the specific research questions and the diversity of the datasets.

The analysis process followed a systematic three-staged coding and theme-generation approach. Data from the interviews, lesson observations, discussion boards, and reflections were transcribed for the qualitative data analysis (Braun & Clarke, 2006). First, in open coding, key themes and concepts were identified from participants' views on active learning, micro-learning modules, and the community of practice. Next, axial coding examined relationships between these codes, particularly how engagement with the professional learning program influenced teaching practices. Finally, in selective coding, core themes were refined to reflect the essence of participants' experiences and were aligned with the study's research questions.

Credibility, trustworthiness and dependability

To ensure credibility and trustworthiness, data were triangulated using multiple sources, including interviews, lesson observations, discussion board posts, and participant reflections. Participants were provided with interview and reflection summaries to verify accuracy. Additionally, expert reviews of the coding process enhanced validity. Detailed context descriptions in this research supported transferability to similar settings (Lincoln & Guba, 1985). To establish dependability, the two researchers of this study independently coded a subset of the qualitative data, compared their results, and resolved any discrepancies through discussion. The inter-coder reliability was assessed using Cohen's Kappa, yielding a score of 0.78, indicating substantial agreement.

Ethical considerations

Ethical approval was obtained from the university's Institutional Review Board (IRB) prior to conducting the research. All participants were informed of the study's purpose, and consent was obtained for video recordings of lesson observations and the use of interview data.

Findings and discussion

This section summarises the key findings and provides a detailed discussion aligned with the research questions, focusing on both the facilitative and challenging aspects of the training, the learning of expertise in active learning, along with the role of micro-learning and the CoP framework. As seen in Table 3, the findings are categorised into themes and subcategories, providing a comprehensive lens on the participants' views and experiences.

Experiences with asynchronous online learning: Benefits and challenges (RQ1)

Participants reported that the asynchronous format afforded important flexibility and autonomy in their professional learning. These aspects allowed the participants to manage their time more effectively, accessing the course materials from multiple devices, such as smartphones and laptops, at any time and location. As evidenced in the interviews, self-paced learning allowed them to balance professional learning with their academic responsibilities. P3 stated, *'I appreciated being able to learn at my own pace, fitting the training into my schedule without feeling rushed'*. Furthermore, discussion board content revealed that the ability to access materials on multiple devices increased engagement: *'Being able to access the course from my laptop, tablet, or phone made it much easier to stay engaged (P5)'*. This aligns with findings in the literature that highlight the value of flexibility and autonomy in online professional learning (Sakkir et al., 2023). Considering the age range of the participants, it can be argued that adult learners particularly benefit from asynchronous learning due to its affordances of flexibility, reflection, and adjustable pace, a claim supported by Lin and Sun (2024).

Despite these advantages, participants encountered challenges in the asynchronous format. A lack of built-in accountability often reduced motivation, as faculty missed the external pressure and peer interaction of synchronous settings. In the interview, P2 remarked, *'Without deadlines or someone checking in, I often found myself procrastinating'*. Lesson observations supported this, showing that participants struggled to maintain regular progress without external pressure. These findings align with studies suggesting the need for structured guidance in asynchronous learning environments (Utomo & Ahsanah, 2022). Jung et al. (2022) also argue that learners require self-regulation strategies to successfully navigate online courses. These insights suggest that targeted scaffolding (such as automated reminders or progress tracking) should be integrated into asynchronous PD programs to sustain engagement and completion rates (Thoradeniya et al., 2023).

Experiences with micro-learning in professional learning (RQ1)

Participants found the micro-learning format effective due to its concise, time-efficient structure, which suited their demanding schedules (P2, P3). The multimodal delivery – featuring videos, quizzes, and infographics – enhanced engagement and aided concept reinforcement (P6: *'I enjoyed the variety of media; it kept things interesting and helped reinforce the concepts'*), supporting findings by Suyo-Vega et al. (2023) on the benefits of micro-learning for adult learners. Do and Lee (2022) similarly highlight that multimodal

Table 3. Themes and categories.

Theme	Category	Sub-Category	Source	Quotation
Experiences with Asynchronous Online Learning: Benefits and Challenges (RQ1)	Facilitative aspects of learning in an asynchronous online training	Flexibility of time, space, and self-paced learning	I	<i>'I appreciated being able to learn at my own pace, fitting the training into my schedule without feeling rushed'. (P3)</i>
		Accessibility through multiple devices	LO	<i>'The instructor allowed the students to participate in the lesson through various ways (synch and asynch) and via various tools'. (for P5)</i>
	Challenging aspects of learning in an asynchronous online training	Lack of self-regulation, thus, motivation to progress in the course	PR	<i>'Without set deadlines, I sometimes found it hard to stay motivated and keep up with the course materials'. (P2)</i>
Lack of a pushing force, pressure, or accountability to progress in the course		DB	<i>'Since there was no one checking in on my progress, I often postponed completing the modules'. (P1)</i>	
Experiences with Micro-Learning in Professional learning (RQ1)	Facilitative aspects of micro-learning based content	To-the-point learning in short breaks of time under heavy schedules	I	<i>'The bite-sized lessons were perfect for squeezing in learning during my busy day'. (P2)</i>
		Multimodality and interactivity	LO	<i>'Having videos, quizzes, and readings made the learning experience more engaging and dynamic'. (for P4)</i>
	Challenging aspects of micro-learning based content	A risk of cognitive load due to a lack of unity	PR	<i>'At times, the lessons felt disconnected, making it harder to see the bigger picture'. (P6)</i>
Improperness for learning advanced and heavy content		LO	<i>'Some complex topics needed more depth, and the short lessons didn't provide enough explanation'. (For P2)</i>	
Developing Expertise in Active Learning Strategies (RQ2 & RQ4)	Gaining expertise in active learning implementation	Aligning learning objectives to active learning strategy use	I	<i>'I learned how to design my lessons so that every activity clearly supported my learning goals'. (P1)</i>
		Implementing student reflection as the closing part of active learning	DB	<i>'This training encouraged me to integrate more interactive techniques into my teaching'. (P4)</i>
	Enhancing student engagement through active learning	Increasing the use of active learning strategies and interaction patterns	PR	<i>'I realized the importance of asking students to reflect at the end of each lesson to deepen their learning'. (P6)</i>
		Encouraging student participation and collaboration	LO	<i>'Group discussions and problem-solving activities have significantly improved student participation in the lesson'. (For P3)</i>

(Continued)

Table 3. (Continued).

Theme	Category	Sub-Category	Source	Quotation
Community of Practice in Online Professional learning: Opportunities and Barriers (RQ3)	Experiencing facilitative aspects of community of practice in an asynchronous online training	Feeling motivated and connected to a community	I	<i>'Knowing others were also going through the same journey made me feel more engaged and motivated'. (P1)</i>
		Collaborative learning and exchange with others	DB	<i>'Discussing ideas with peers gave me new insights and perspectives I wouldn't have considered on my own'. (P3)</i>
	Experiencing challenging aspects of community of practice in an asynchronous online training	Lack of pressure or a pushing force	PR	<i>'Since participation was optional, I didn't feel a strong need to contribute regularly'. (P2)</i>
		Unwillingness in interacting and exchanging with others	LO	<i>'Some learners preferred to work alone, which made it difficult to create meaningful discussions'. (For P1)</i>

I: Interviews, PR: Participant Reflection, DB: Discussion Board, LO: Lesson Observation.

resources increase learner engagement and retention by addressing varied learning styles. However, participants also reported challenges, including fragmented content and cognitive overload, which hindered coherence and deep understanding of complex topics (P2: *'Some complex topics needed more depth, and the short lessons didn't provide enough explanation'*). These concerns suggest a need for better content integration and scaffolding. This echoes Mayer's (2005) concerns about cognitive overload in micro-learning environments when content is broken into isolated pieces. Our findings suggest that to maximise effectiveness, micro-learning modules should be intentionally linked and contextualised (for example, via summary cues or thematic framing) to help learners integrate the material.

Developing expertise in transferring active learning strategies to teaching in action (RQ2 & RQ4)

The training notably improved faculty's ability to implement active learning in their courses. As indicated in interviews, faculty members demonstrated better alignment of activities with learning objectives: *'I learned how to design my lessons so that every activity clearly supported my learning goals'* (P1). Additionally, participant reflections showed that lesson structures incorporated more student engagement activities, such as collaborative discussions. P5 stated, *'I've started to incorporate more activities that get students talking and thinking, rather than just listening to me'*. Observations of classroom implementation further confirmed these findings, with increased use of student reflections and interactive learning techniques. Participating faculty members were observed to use the active learning techniques in their courses, with clear implications that the active learning handbook shared in the online course helped them to remember practical ideas in pre-lesson planning and during teaching. This was also clear in faculty members' reflections and shared lesson plans in the online course, indicating that they integrated the newly acquired knowledge into their daily teaching habits. P3 observed improved student participation through group discussions, supporting research that active learning

enhances engagement and leads to better student outcomes (Halimi & Halimi, 2022). In particular, the findings support theories that combine practical micro-learning content with a reflective CoP can foster pedagogical improvement. By documenting these teaching changes, the current study adds to the literature on faculty PD, highlighting that asynchronous, micro-structured programs can lead to observable enhancements in active learning implementation (Bui & Brooks, 2023). Peculiar to the current study, the digital support mechanisms and multimodal approaches have fostered faculty members' learning transfer by incorporating newly acquired knowledge into daily practices (Elliott et al., 2024). Additionally, considering the diversity of participants' academic disciplines, this research underscores that active learning strategies are broadly applicable and beneficial across various subject areas (Dogani, 2023).

Community of practice in online professional learning: Opportunities and barriers (RQ3)

The CoP component of the program clearly fostered a collaborative learning culture among faculty. Participants valued exchanging ideas and experiences online, often feeling boosted by peer support. As P3 noted, 'Discussing ideas with peers gave me new insights and perspectives I wouldn't have considered on my own', and P5 observed, 'It was helpful to see how others were approaching the same challenges and to get feedback on my ideas'. This underscores Wenger's (2011) assertion that collaborative interaction is central to professional growth. The sense of belonging to this community also motivated engagement – P6 also remarked that knowing 'others were in the same boat' kept her connected and going. These experiences correspond with research on online CoPs enhancing motivation and persistence (A. Smith et al., 2022). Notably, it can reasonably be argued that the principles CoP are not limited to any single nationality and can be applied universally, although the way individuals engage with them may vary depending on cultural or national background (M. D. Smith et al., 2024).

Despite their benefits, some participants struggled with consistent engagement in the CoP due to limited accountability and optional participation (P2: '*Since participation was optional, I didn't feel a strong need to contribute regularly*'). Varying discussion quality also impacted experiences, with some interactions deemed superficial (P6: '*Sometimes the discussions felt superficial, and I didn't always get the feedback I was hoping for*'). This aligns with research emphasising the need for active facilitation and sustained involvement (Fuller, 2022). This also suggests that clear expectations and facilitation mechanisms (e.g. scheduled meetings or defined discussion roles) are needed to sustain interaction (Putri & Damayanti, 2023). By examining both the strengths and barriers of an online CoP in faculty PD, our study clarifies how peer networks can support – yet also require support in – virtual professional learning environments.

Synthesis of key insights

Asynchronous online learning, micro-learning, active learning strategies, and online CoPs each offer distinct contributions to faculty development. This research highlights asynchronous learning's flexibility and self-paced nature as essential for educators managing diverse responsibilities (Clevenger, 2022), supporting improved outcomes through

repeated content access and discussion (Andresen, 2009). These benefits align with our findings that emphasise structured support – like reminders and live Q&A – to mitigate motivational challenges and enhance accountability (Martin et al., 2024).

Similarly, micro-learning's concise, targeted approach aligns with busy faculty schedules and has shown efficacy in enhancing engagement and performance, particularly in applied disciplines (Fidan, 2023). Its ability to reduce cognitive overload and promote sustained attention supports our findings on its instructional value (Zrnic, 2024).

Active learning strategies continue to transform teaching by encouraging interactive, student-centred approaches that elevate cognitive engagement (Park & Xu, 2022). This study shows that faculty benefit from improved student participation but often require structured support to navigate their evolving roles (Brooks & Hughes, 2024).

Finally, CoPs provide critical peer support and foster professional growth, particularly in remote and crisis contexts, though engagement can be limited by institutional and time constraints (Steinert et al., 2009). Hybrid CoPs offer a solution, integrating digital and local networks for sustained impact (Schlager & Fusco, 2003).

Conclusion

This study demonstrates the significant impact of asynchronous, micro-learning-based PD on active learning integration in higher education. By combining short and focused learning modules with a CoP framework, faculty members were able to apply more active strategies in their teaching, resulting in higher student engagement, improved alignment of activities with learning objectives, and more interactive classroom environments. These findings add to the literature by showing that even brief, flexible online professional development can yield concrete pedagogical improvements, addressing a gap in research on remote faculty training.

Our results also highlight key design principles and challenges for such programs. Flexibility and varied content formats (videos, quizzes, etc.) emerged as critical motivators, consistent with prior work on adult learning. However, sustaining motivation in self-paced courses was difficult for some participants. This suggests that structured support (such as regular check-ins or incentives) and strong institutional backing are needed to maintain engagement. The inclusion of a CoP proved valuable for peer support and accountability, but it too requires clear expectations and active facilitation. Remarkably, well-designed asynchronous PD should balance autonomy with guidance, providing scaffolded support while preserving flexibility.

Future research should focus on refining these models to maintain engagement and ensure the practical application of learning in diverse teaching contexts. Given the positive reception of multimodal content, future programs should continue leveraging diverse formats, such as infographics and interactive exercises, to cater to different learning preferences and maximise engagement.

This study has limitations, including the subjectivity of participant responses and researcher observations, which affect the generalisability of the results. Conducted at a single university, the findings may differ in other settings. Additionally, the lack of a control group suggests that future studies should include diverse institutions and control groups for broader generalisation.

In conclusion, this research demonstrates the significant impact of a micro-learning-based, asynchronous online course combined with a CoP model on faculty adoption of active learning strategies. The findings emphasise the need for flexible, self-paced, and collaborative professional learning programs, while also stressing the importance of accountability and well-structured content to address motivational challenges and cognitive overload.

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Data availability statement

Due to privacy concerns, the data is securely stored and can be made available upon reasonable request.

Declarations and author credits

This study was part of a completed Ph.D. thesis that was conducted in an Artificial Intelligence-Teaching and Learning Center at a university. The first author (currently Dr., formerly the Ph.D. candidate, and the head of the centre) took part in the whole process of planning, designing, implementation and evaluation of the study. The advisor, as the second author, contributed to the

methodology, training plan, and implementation. The third author made contributions in the planning of the faculty training and material development in the centre, literature updating, and content analysis in the research part.

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