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Pedagogical Adaptation in AI-Enhanced PADD Collaborative Classrooms: A Qualitative Study of University Teachers in Higher Education

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Abstract

Teaching and learning practices are taking a new shape, changing the direction of higher education. However, much of the focus has been on examining acceptance of artificial intelligence (AI) and technological readiness among teachers. This has left scope for pedagogical adaptations to be explored during classroom implementation. The present study explores teachers' adaptation of their pedagogy in integrating generative AI into Presentation-Assimilation-Discussion-Development (PADD) collaborative classrooms. Data were collected using semi-structured interviews with 15 university teachers belonging to diverse disciplinary backgrounds. Reflexive thematic analysis was used to analyse the data, guided by Social Constructivism and the Technological Pedagogical Content Knowledge (TPACK) framework. The findings show that teachers restructured instructional practices by integrating AI into their teaching via pedagogically informed decisions. Also, teachers perceived that generative AI could promote shared inquiry, reflection, and collaborative communication. Finally, the participants also perceived their professional identity as evolving and characterised by context-dependent decision-making and ethical accountability. These findings show that teachers' sense of responsibility was crucial to maintaining educational value in the face of AI. Also, meaningful generative AI integration is a process of pedagogical adaptation rather than technology adoption alone. Overall, this study contributes empirical evidence on AI-enhanced teaching in PADD classrooms. It also offers practical guidance for professional development of teachers to ensure pedagogically informed integration of AI in higher education.

Keywords: pedagogical adaptations, PADD collaborative classrooms, generative AI, higher education, university teachers

1. Introduction

1.1 Background and Rationale

Generative AI has emerged as a technological tool with the potential to transform higher education and its teaching practices, student learning, and assessment. Interestingly, generative AI is rapidly being adopted to support lesson preparation, seeking feedback, and designing assessments (Liang et al., 2025). This creates new opportunities for interactive and tailored educational experiences. The growing accessibility and use of generative AI raise important questions about pedagogical adaptation and its meaningful and ethical integration into higher education (Creely, 2026; Slimi, 2026). As universities also continue to incorporate generative AI into their educational practices, the focus has shifted from whether it should be used to its ethical and meaningful integration in education, so that it enhances student learning while preserving academic integrity and maintaining pedagogical quality.

The considerable potential of generative AI has been documented in the existing literature (Celik et al., 2022; Salas-Pilco et al., 2022), which focuses on increasing the efficiency of instruction, supporting curriculum design, and overall promoting student engagement. Also, beyond instructional design, research indicates that AI can play a facilitative role for collaborative learning and constructing knowledge (Baskara, 2024; Kurki et al., 2024). These

studies suggest that the educational value of GenAI depends less on the technology itself than on teachers' pedagogical decisions regarding its classroom use.

However, even with these opportunities, generative AI integration without adequate pedagogical planning can lead to notable challenges for teaching and learning. Evidence from García-López and Trujillo-Liñán (2025) emphasizes that careful implementation requires institutional guidance rather than technology adoption alone. Another recent review reported that even when technology can support engagement, collaboration, and accessibility, its inappropriate use in higher education may undermine critical thinking, academic integrity, and independent learning (Abdallah et al., 2025). Therefore, these concerns make teacher acceptance and informed adoption crucial, as teachers also need sufficient confidence and knowledge to evaluate AI critically and determine its pedagogically appropriate use.

Current literature primarily focuses on AI adoption, student outcomes, or the effectiveness of PADD teaching, leaving a limited understanding of how university teachers redesign their pedagogy when integrating AI into PADD classrooms. In addition, the current research base is also heavily focused on teachers' readiness, acceptance, and AI literacy related to the use of generative AI, and comparatively less attention is given to the way teachers continually adapt their pedagogy during actual classroom implementations. This leaves scope to explore the dynamic process by which teachers in higher education facilitate collaborative construction of knowledge, redesign instruction, and adjust their professional roles in AI-enhanced classrooms (Chen et al., 2020; Crompton & Burke, 2023), where the PADD model is applied as a pedagogical framework. Therefore, this study addresses this gap by exploring teachers' experiences of pedagogical adaptation within AI-enhanced PADD teaching, providing practical implications for technology-supported instructional innovation in higher education. The study thus aims to explore how university teachers adapt their pedagogy when integrating generative AI in AI-enhanced PADD collaborative classrooms.

1.2 Research Questions

RQ1. How do university teachers adapt their instructional practices when integrating generative AI?

RQ2. How does generative AI influence collaborative learning in AI-enhanced PADD classrooms?

RQ3. How does generative AI reshape teachers' professional identity?

2. Literature Review

2.1 Generative AI in Higher Education

As generative AI possesses the capability to create new content, it is increasingly reshaping higher education by being integrated to support communication and assist pedagogical practices in varied knowledge tasks, including lesson preparation, feedback, and design work. Nevertheless, the key concern in higher education is no longer limited to what generative AI can or cannot do; instead, the focus is shifting towards the way it is actually being implemented in pedagogical practices and student learning such that pedagogical integrity is maintained. Although practical implementation of generative AI remains underexplored, it is already reshaping student support systems and pedagogical practices (Belkina et al., 2025). Therefore, further research is needed to understand meaningful generative AI integration in student learning, especially where curriculum needs and pedagogical strategies have to be better aligned.

2.2 PADD Collaborative Classroom Teaching

In this study, PADD is operationalised as an extension of the Presentation–Assimilation–Discussion (PAD) model, with a fourth Development stage added to emphasise the application, extension, and transfer of collaboratively constructed knowledge (see Table 1). The evolved PADD classroom model is also built on the PAD (presentation–assimilation–discussion) classroom approach, which divides teaching into initial teacher-led presentations followed by group discussions and student learning (Zhai et al., 2022). In addition, across higher education, students have shown that PAD can improve class engagement and learning outcomes in English writing and education fields (Ding et al., 2023). These studies suggest that the evolved PADD model is not merely a teaching format; it also provides a structured framework for integrating pedagogical adaptations involving independent learning, collaborative dialogue, and explanation.

Table 1. Operationalisation of the PADD Collaborative Classroom

Stages	*Purpose*	*Example learning activities*	*Role of GenAI*
Presentation	Introduce key concepts and establish the learning focus	Teacher explanation, examples, demonstrations, and framing of learning objectives	Supports lesson planning, explanations, examples, and resource preparation
Assimilation	Allow students to process and develop an initial understanding	Individual reading, reflection, practice, questioning, and preparation for group interaction	Provides summaries, examples, explanations, and practice prompts
Discussion	Construct and negotiate understanding through interaction	Peer discussion, comparison of interpretations, questioning, justification, and collaborative problem-solving	Provides alternative perspectives or prompts that stimulate discussion
Development	Apply, extend, and transfer learning beyond the immediate discussion	Projects, authentic problems, creation, application, extended tasks, and real-world transfer	Supports idea development, problem-solving, application, and extension of knowledge

For this study, the Discussion stage of PADD refers to the collaborative negotiation and refinement of ideas through peer interactions, and the Development stage represents the subsequent application, extension, and transfer of that emerging understanding to more complex or authentic tasks. In other words, discussion centres on developing and testing shared understanding, whereas development focuses on using that understanding to create, solve, apply, or extend knowledge beyond the immediate discussion.

In research focused on business English writing, it was found that the PAD model approach could improve student scores along with increasing their interest in writing (Sun & Asmawi, 2023). This suggests the approach can support performance improvement and student engagement. Another recent research study in nursing education found that PAD outperformed traditional lecture-based learning in immediate performance and retention (Wang et al., 2025). However, it required stronger classroom facilitation and could be challenging for students who were hesitant to participate.

Studies have described blended PAD implementations in online and offline settings, as well as AI-empowered versions that extend the model into PADD-like formats (such as dialogue or demonstration), indicating that the original structure is being refined to suit technology-supported environments (Chiu & Chai, 2020; Holstein et al., 2019). Thus, the present study builds on this logic by using PADD to foreground development-oriented learning, where teachers' pedagogical adaptations are expected to support students in transferring and applying their learning beyond the classroom. Also, research has shown how AI-supported tools can extend the PAD approach into collaborative dialogue and demonstration, which further highlights teacher adaptation (Schwarz et al., 2018).

2.3 Theoretical Foundations

The Technological Pedagogical Content Knowledge (TPACK) framework is the primary guide for this study, as it explains the integration of technological, pedagogical, and content knowledge when making instructional decisions. Also, TPACK provides a comprehensive lens through which teachers redesign teaching activities while combining them with generative AI. Social Constructivism underpins this perspective, as it helps to understand the learning processes in PADD classrooms and emphasises knowledge construction via interactions, collaborative discussions, and reflections. Together, these two frameworks provide a coherent explanation of teachers' pedagogical adaptations that influence students' collaborative learning experiences in AI-enhanced classrooms.

2.4 Conceptual Framework

The conceptual framework for this study positions generative AI as a mediator for pedagogical adaptations across the PADD model. For example, during presentation, generative AI supports planning lessons, explaining concepts to students, and generating relevant resources, which reflects the TPACK emphasis on coordinated technological, pedagogical, and content knowledge. Likewise, during assimilation and discussion, generative AI acts as a scaffold for teacher reflection and adaptations to enhance collaborative knowledge construction. This aligns with the social constructivist perspective. Finally, in the development stage, generative AI is expected to support the transfer of

knowledge, its application, as well as its extension beyond classroom learning. Therefore, the framework in Figure 1 treats PADD as a complete pedagogical environment, where generative AI, collaborative learning, and teacher judgment interact dynamically to support meaningful learning opportunities in higher education.

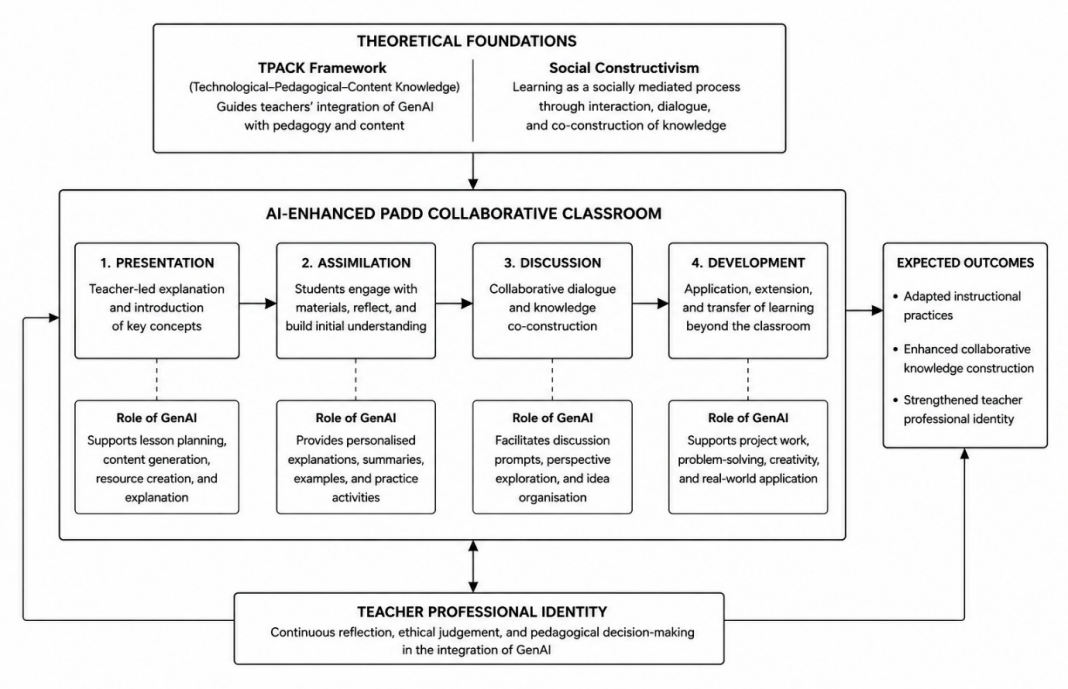


Figure 1. Conceptual Framework to Support the Study

2.5 Significance of the Study

This study is significant because the current use of generative AI in higher education is more concentrated on the broader implementation possibilities, perceptions, and technology-supported outcomes, rather than day-to-day pedagogical adaptations in AI-enhanced classroom environments. Recent systematic evidence highlights that practical classroom implementation of generative AI is somewhat under-explored (Belkina et al., 2025), as educational value depends on effective pedagogical planning and is accompanied by concerns involving academic integrity, critical thinking, privacy, bias, and over-reliance (Abdallah et al., 2025; García-López et al., 2025). These challenges lead teachers to use their informed judgments in deciding the way AI should be incorporated into class activities. Emerging work on AI-driven professional development argues that teachers in higher education require support not only in using the tool but also in making pedagogically and ethically informed decisions. Therefore, by examining PADD classrooms, this study addresses that gap and seeks to show that generative AI integration becomes meaningful, particularly when teachers actively redesign instruction, maintain professional judgement, and engage in supportive collaborative learning.

3. Methods

3.1 Research Design

An interpretivist qualitative design was adopted to explore university teachers' experiences of adapting PADD collaborative teaching practices in AI-supported classrooms. A qualitative approach was appropriate because this study is concerned with understanding teachers' instructional reasoning, perceptions of pedagogical change, and classroom decisions, rather than measuring variables or testing effects. Recent guidance on qualitative inquiry emphasises its value in capturing the meanings participants assign to their educational experiences (Kim et al., 2017; Lim, 2025), while qualitative descriptive approaches are often used when the study requires a practical account of those experiences.

3.2 Participants and Sampling

Fifteen university teachers who were involved in using PADD for their collaborative classroom teaching and generative AI in their undergraduate courses were recruited through purposive sampling so that information-rich participants could describe concrete examples from their teaching contexts and disciplines. Maximum variation sampling was applied to recruit teachers from varied teaching backgrounds. Purposive sampling was suitable here because it assists in identifying participants who can provide useful and relevant information for specific research purposes (Campbell et al., 2020). In addition, information power was an important consideration, as it suggests that smaller samples can suffice in research where highly relevant participants are selected to answer the research questions (Malterud et al., 2016). This supported the collection of rich and focused data.

3.3 Data Collection

The primary data source for the research was semi-structured interviews, as they enabled teachers to explain how AI shaped each phase of PADD teaching, such as class interactions, lesson design, and post-class activities. Each of the 15 participants completed one semi-structured interview, lasting 35 to 45 minutes. Data collection took place from February 2026 to July 2026. A common set of guiding questions was used that covered teachers' experiences of integrating generative AI across the PADD stages. This allowed participants to elaborate on their discipline-specific experiences and pedagogical adaptation.

3.4 Data Analysis

The data were analysed using reflexive thematic analysis. For the present study, this approach is suitable because reflexive thematic analysis enables the identification of patterned meanings across teachers' accounts while still preserving their experience-based contextual nuances (Byrne, 2022). Data analysis proceeded iteratively through familiarisation with the data, coding, development of themes, reviewing and naming the themes, and final write-up (Braun & Clarke, 2021). This process assisted in identifying patterns in teachers' experiences, with the final interpretation informed by TPACK and a social constructivist perspective. It helped explain the way learning and teaching are shaped through interaction and collaboration in PADD classrooms.

3.5 Trustworthiness and Ethics

To ensure the trustworthiness of the study, reflexive memoing was adopted, together with repeated engagement with the interview responses during coding and theme development. Reflexive memoing was undertaken wherever relevant to encourage critical awareness of the researcher's interpretive position and support credibility, dependability, and transparency in the analytical process (Korstjens & Moser, 2018; Lincoln & Guba, 1985). Ethical considerations for the research included securing institutional approval and collecting voluntary and informed consent from participants. The study also ensured their anonymity by using participant codes (P1-P15). The data were securely stored on a drive accessible only to the researchers. Particular care was taken to anonymise any identifiable student or institutional information shared during the interview.

4. Results

4.1 Participant Characteristics

Fifteen university teachers participated in this study, representing a diverse range of academic disciplines (see Table 2) and having between 7 and 20 years of teaching experience. All participants had practical experience integrating generative AI into PADD collaborative classrooms and were actively implementing the PADD model in undergraduate and/or postgraduate teaching. Reflexive thematic analysis generated three central themes that described teachers' pedagogical adaptations in generative AI-enabled PADD classrooms.

Table 2. Demographic Characteristics of Participants (N = 15)

Participant	Academic Discipline	Teaching Experience (Years) and Level	Experience Integrating Generative AI (Years)	Experience Implementing PADD (Years)
P1	Education	18; Undergraduate and Postgraduate	3	5
P2	English Language Education	15; Undergraduate	2	4
P3	Educational Technology	9; Undergraduate	2	2
P4	Business Administration	13; Undergraduate and Postgraduate	3	4
P5	Marketing	11; Undergraduate	2	3
P6	Accounting	8; Undergraduate	2	2
P7	Computer Science	16; Undergraduate and Postgraduate	3	4
P8	Information Technology	12; Undergraduate	2	3
P9	Mechanical Engineering	7; Undergraduate	2	2
P10	Psychology	20; Undergraduate and Postgraduate	3	5
P11	Public Administration	17; Postgraduate	3	4
P12	Economics	10; Undergraduate	2	2
P13	Chinese Language and Literature	19; Undergraduate and Postgraduate	3	5
P14	Foreign Languages	14; Undergraduate	2	3
P15	Law	11; Undergraduate and Postgraduate	2	2

4.2 Theme 1: Adapting Instructional Practice

The study participants described generative AI as encouraging changes in higher education instructional practices, rather than replacing established teaching approaches. Across disciplines, teachers reported redesigning lesson preparation, responding more flexibly during classroom instruction, and encouraging greater learner independence within the presentation and assimilation stages of the PADD model. Participants viewed AI as a planning partner because it helped reduce routine preparation while allowing teachers to retain responsibility for instructional quality.

As P1 explained, *"AI gives me a starting point for lesson planning, but I still redesign the materials to suit my students and course objectives."*

Similarly, P5 noted, *"It saves me time in finding examples and activities, leaving me more time to think about how students will actually learn."* Thus, these accounts show that teachers' efforts shifted from producing teaching materials to refining pedagogical design with AI.

They also described becoming more responsive in their classroom teaching by adapting explanations more effectively to students' needs.

Here, P7, a computer science lecturer, said, *"When students struggle with coding concepts, I generate different examples immediately instead of relying on the same explanation."*

P8 similarly reflected that *"AI helps me explain difficult topics from a student-friendly perspective, but I still decide which explanation fits the class."*

Participants from technology disciplines emphasised problem-solving support, while those from language-based disciplines highlighted the value of contextualising learning.

P14 explained, *"I use AI to create authentic communication scenarios, but meaningful discussion still depends on the way I guide students through those scenarios."* These different experiences suggest that disciplinary contexts influence how AI is integrated into teaching, while reinforcing the central role of teachers' pedagogical judgement.

Thus, participants described instructional adaptation as a shift towards designing enriched learning experiences for students. Although participants perceived generative AI as improving efficiency and instructional flexibility, they consistently upheld personal responsibility for choosing and contextualising AI-generated resources to support student learning meaningfully.

4.3 Theme 2: Adapting Student Learning

Participants reported that integrating generative AI also reshaped how students engaged with learning. Teachers reported that rather than increasing passive dependence on technology, they redesigned learning activities to promote collaboration, authentic knowledge application, and critical reflection throughout the discussion and development stages of the PADD model.

Participants perceived AI as expanding opportunities for learners to engage with different ideas, evaluate alternative perspectives, and participate in iterative knowledge construction. However, their meaningful collaborations also depended on teachers' facilitation, not AI itself.

This is supported by P2's statement that "*I have observed that students come to discussions with more ideas because of AI, but in my opinion, they still need skills to justify and debate those ideas with their classmates. It can help them develop proficiency in critical thinking."*

Similarly, P4 noted, "*AI starts the conversation, but the real learning happens when students question each other's interpretations."* These accounts suggest that in PADD collaborative classrooms in higher education, generative AI operates as a catalyst for collaborative inquiry, not just as a replacement for peer interaction.

Also, participants pointed out that they used AI in designing authentic learning tasks to connect theoretical knowledge with practical contexts. This is supported by P6, who said that *"Students in my module usually analyse AI-generated business cases, but I require that they must identify weaknesses and recommend better solutions instead of accepting the ready answers, which earns them points for in-class engagement."*

Likewise, P10 reflected, *"AI gives psychology students realistic, clinical scenarios, yet they still have to interpret behaviour using established theories and frameworks rather than AI's conclusions."*

Compared to participants from professionally oriented disciplines, those teaching humanities placed greater emphasis on contextual, interpretive understanding of the scenarios.

As P15 pointed out, *"Students often compare AI translations with their own writing, which helps them recognise cultural nuances that AI frequently overlooks, and they get excited finding technology's loopholes."*

These experiences suggest that, from participants' perspectives, AI-supported activities could strengthen opportunities for learning when students were directed to evaluate content and apply knowledge critically rather than taking AI-generated responses at face value. Overall, participants perceived AI-supported learning activities as enhancing opportunities for collaboration, reflection, and application of knowledge in PADD classrooms.

4.4 Theme 3: Adapting Professional Identity

When using generative AI in collaborative classrooms, pedagogical adaptations also involved redefining teachers' professional identity. They did not see AI as diminishing their role, but as requiring new forms of expertise centred on pedagogical judgment, continuous professional learning, and ethics. In this context, some participants explained that AI helped them shift their role from being viewed as the primary information source to becoming a learning facilitator.

P3 responded, "*With the help of AI, it is evident that students can get a hold of immediate information. My responsibility here is to help them evaluate that information critically, connect the dots, and use that knowledge meaningfully.*"

P11 said that "*To me, teaching is not about knowing solutions to all questions but asking questions that help students*

to consider the information beyond the AI outputs."

These responses highlight teachers' perceptions that their professional expertise remained an important component of effective pedagogy. Regarding professional responsibility, participants also noted that integrating generative AI heightened their awareness of and accountability for their teaching.

P9's comment supports this, mentioning, "*I have noticed in my practice recently that students often tend to trust AI without second-guessing it. So, I think if this is not contained, it can hamper their evaluations. So, I feel more inclined and responsible to teach them when to challenge it and how to critically question it for accurate information."*

P12 noted similarly that "*For my pedagogical activities, I feel that using AI purposefully needs constant learning and awareness, mainly because that tech can upgrade faster than teaching materials we develop."*

This revealed that, compared with less experienced participants who focused on developing technical confidence among students, senior teachers prioritised ethical decision-making and maintaining academic standards while integrating generative AI into teaching.

For meaningful integration of generative AI in higher education, participants regarded continuous professional development as essential for teaching in generative AI-enabled collaborative classrooms.

As P13 shared, *"In my view, learning to use AI is not enough; teachers also need to understand its limitations and model responsible use for students."*

Overall, these experiences show that pedagogical adaptations in higher education are about the ongoing transformation of teachers' professional identity. Using generative AI reinforced their role as learning facilitators and ethical decision-makers who reflect on technological innovation and connect it with pedagogically appropriate practice.

5. Discussion

This study demonstrated the multidimensional nature of pedagogical adaptation in AI-enhanced PADD collaborative classrooms. It involves redesigning instruction, collaborative learning, and the changing professional identity of university teachers. Generative AI is not an independent driver of educational change, as university teachers emphasised that the pedagogical value of AI depends on the integration of technological capabilities into instructional decisions and collaborative learning approaches.

Considering the TPACK framework and social constructivism, the study findings suggest that pedagogically informed generative AI integration involves continually evolving teaching methods and strategies, discipline-specific knowledge, and socially driven learning processes.

5.1 Pedagogical Adaptation as Instructional Redesign

As participants pointed out, their pedagogical adaptation involved more than simply adopting a new technological resource in AI-enhanced PADD classrooms. They did not consider generative AI a substitute for their teaching, and described consciously deciding when to use AI, how to integrate it, and the extent to which it should support student learning. According to the TPACK framework (Koehler & Mishra, 2009; Mishra & Koehler, 2006), these experiences illustrate that meaningful integration of generative AI depends on teachers' capacity to coordinate pedagogical, technological, and disciplinary knowledge to achieve instructional goals.

This interpretation also aligns with an expanding body of literature arguing that successful generative AI integration is primarily a pedagogical rather than technological effort. Teachers' effective generative AI use is shaped by the interaction of AI education, contextual judgement, pedagogical expertise, and evolving TPACK competencies (Al-Abdullatif, 2024; Dogan, 2026).

Likewise, recent systematic evidence (Liu & Zhong, 2025) suggests that the educational value of generative AI emerges when technological knowledge is integrated with appropriate pedagogical and disciplinary considerations. This reinforces TPACK as a useful lens for the present study through which teachers transform generative AI capabilities into pedagogically meaningful student learning activities. Therefore, rather than viewing AI as an autonomous solution for improving instruction, recent research positions teachers as informed pedagogical designers who are essential for adapting, interpreting, and regulating AI use iteratively (Levy-Nadav et al., 2026; Shenoy & Saarela, 2026).

The present study reinforces these insightful perspectives, extending them beyond technology adoption and

instruction-based planning. A recent study showed that teachers employ ChatGPT and other generative AI tools to support lesson and unit design (Wen & Wen, 2024); however, participants' insights highlight that pedagogical adaptation is an ongoing process that continues throughout classroom application. Hence, instead of using AI to simply generate instructional materials, they refined AI-generated content and modified collaborative activities and explanations so that the use of AI aligns with disciplinary expectations across the four stages of the PADD model. Therefore, the present study's findings reflect observations made by Georgiou et al. (2026) that higher education teachers negotiate the integration of generative AI use via interconnected TPACK dimensions.

They also illustrate the way these negotiations are enacted in practice through iterative pedagogical adaptations. Overall, the findings support the emerging consensus that integration of generative AI is a dynamic process of instructional redesign led by teachers, rather than simple technology adoption.

5.2 AI-Supported Collaborative Learning Through Knowledge Construction

Apart from reshaping instructional practice, the study findings suggest that, from teachers' perspectives, generative AI can reshape opportunities for student engagement in learning (Jung & Jin, 2025). This can be seen from a social constructivist perspective, where AI operates as a mediating tool to encourage questioning, dialogue, and shared meaning-making. This enables students to shape their learning through peer interactions, teacher support, and AI-generated responses (Zhou & Schofield, 2024). Participants perceived AI as expanding opportunities for learners to engage with different ideas, evaluate alternative perspectives from peers, and engage in iterative processes to construct knowledge. This reinforces the inherently social nature of meaningful learning despite increasing access to AI technologies.

These findings are supported by research that positions generative AI as a cognitive and collaborative scaffold for learners, without serving as the sole source of knowledge. Also, recent work by Kovari (2025) has highlighted that AI-assisted learning is more meaningful with active co-construction of ideas by learners. This helps learners to avoid accepting AI outputs uncritically and encourages reflection, dialogue, and shared problem-solving. In addition, studies on student-AI collaboration by Daniel et al. (2025) and Msambwa et al. (2025) also noted that productive learner interactions evolved from their ability to construct knowledge and meaning. These accounts suggest that participants perceived students' engagement with generative AI as increasingly reflective and purposeful.

The findings from this study contribute to the literature by showing the prominence of collaborative knowledge construction as a continuous pedagogical process within the PADD structure. This means collaboration does not occur just during discussion but across the four PADD stages, with AI support, and it contributes to richer engagement with disciplinary knowledge (McDonald et al., 2025). This indicates that AI creates opportunities for collaboration that become meaningful through dedicated pedagogical design and teacher-led facilitation (Kim, 2024). Overall, the contribution of AI lies primarily in strengthening the social processes by which learners exercise their ability to question, negotiate, and construct meaning collectively within AI-enhanced PADD collaborative classrooms.

5.3 Professional Identity in AI-Enhanced Higher Education

The study findings highlight that generative AI is reshaping the professional identity of teachers by redefining pedagogical expertise in AI-enhanced classrooms. Participants were not passive AI users, instead they had a strong sense of personal responsibility for evaluating AI-generated content. They used their professional judgment to assess the appropriateness of AI use to maintain ethical and disciplinary standards in higher education. Recent studies by Dogan (2026) and Lan et al. (2025) point out that AI integration goes beyond technological adaptability, as it involves ethical awareness and intentionality in teaching as well. This means that teachers are expected to make context-sensitive decisions about AI use in practice.

Studies also suggest that shifts in professional identity are supported by ongoing professional development of teachers. A systematic review of 95 studies on AI use in teaching and teacher professional development found that the research base is more focused on AI use in teaching than on AI for teacher development (Tan et al., 2025). This leaves a substantial gap in understanding the way teachers build the knowledge and confidence needed for responsible generative AI integration. Recent research has argued that professional development in dealing with generative AI needs to prioritise AI literacy that includes teachers' understanding of AI capabilities and their limitations, as well as the ethical implications (Brandão et al., 2024). This allows university teachers to adapt their role and practices in guiding students towards safe, informed use across diverse educational settings (Yuan et al., 2026). Overall, this aligns with the present findings, in which participants viewed AI competence as extending beyond familiarity with the tool, towards an evolving learning process that assists them in adapting and

contextualising generative AI in pedagogically feasible ways.

The present findings also align with recent empirical work regarding the support provided by generative AI for the professional growth of teachers while reshaping their understanding of the role. For example, a mixed-methods study of K-12 teachers revealed that generative tools such as ChatGPT were used not just for inspiration and developing the lesson structure, but also as a means of supporting self-directed professional development (Li et al., 2026). With this development, teachers also reported better self-management, confidence, and self-monitoring in their interactions with generative AI tools (Erbay-Çetinkaya, 2025). The study participants did not think of AI tools as a substitute for them but as an aid in improving their approaches to higher education pedagogy and its diverse requirements. This is reflected in phenomenological research where participants initially feared erosion of their roles but later recognised AI as a support for teaching rather than a replacement (Isma'il & Ibrahim, 2025). This highlights that professional identity development around the use and adaptation of AI tools in AI-mediated educational environments requires sustained support and facilitation. Overall, these insights highlight that in higher education, generative AI is not regarded as an additional tool for improving instruction and pedagogical approaches. Instead, it prompts teachers to review and rethink their expertise as a combination of sound ethical judgment, reflection, and adaptive facilitation of technological tools. Thus, AI-enhanced PADD classrooms reshape teachers' negotiation of professional identity through pedagogical decisions across diverse teaching situations.

6. Conclusion

6.1 Summary of Findings

This study explored the way university teachers adapt their pedagogical approaches in AI-enhanced PADD collaborative classrooms. It was evident from the findings that generative AI did not operate as the sole driver of educational change. Instead, its educational value was perceived by participants to be linked to collaborative construction of knowledge among students, use of instructional judgment by teachers, and reconfiguration of teachers' professional identity in higher education. Given the three themes that emerged from participant responses, the use of generative AI was perceived as more meaningful when guided by pedagogical decision-making rather than being treated as a substitute for teachers. The findings suggest that pedagogical adaptations within structured learning processes such as PADD can support teachers' meaningful integration of GenAI while creating opportunities for student collaboration, reflection, and knowledge application.

6.2 Limitations and Future Directions

Some limitations of the study need to be noted before generalising its findings. The study was conducted with a small sample of 15 university teachers, which is appropriate for a qualitative study but limits broader generalisations to regional or international educational contexts. Participants came from a wide range of disciplines, which was enriching for the data but may have also introduced variability in the way generative AI and PADD were understood and applied across different contexts. This study relied on self-reported interview data, which means records of class interactions and/or observations and students' perspectives were not included. Thus, the findings need to be interpreted as the reported experiences of teachers in their pedagogical adaptations rather than direct practice-based observations. For this reason, future research could incorporate analyses of teaching materials, classroom observations, and students' perspectives to provide a comprehensive picture of PADD classrooms.

6.3 Theoretical and Practical Contributions

Theoretically, the study highlights the value of TPACK in explaining pedagogical adaptation and instructional redesign in AI-enhanced classrooms, and social constructivism in clarifying the way AI can support collaborative knowledge construction. From a practical perspective, the study suggests that universities should support teachers through sustained professional development and opportunities to redesign PADD activities for AI-supported student learning. Overall, higher education educators can frame generative AI as an adaptive pedagogical resource whose value depends on teacher-led facilitation, ethical integration, and critical use.

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