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Synergizing Human and Artificial Intelligence: A Narrative Inquiry into Collaborative Reflective Practice for EFL Teacher Development in Iran

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ABSTRACT

Designing practical professional development (PD) for language teachers remains a persistent concern, particularly in settings where linguistic, cultural, and institutional dynamics are intertwined. This study explored the experiences of 30 Iranian English-as-a-Foreign-Language (EFL) teachers teaching in public junior high schools in a synergistic PD model integrating class-based reflection, ICT-mediated collaboration, and AI-driven support within communities of practice. Adopting a qualitative narrative inquiry approach grounded in sociocultural theory, the researchers collected the data over nine months from multiple sources, including reflective essays, interviews, AI interaction logs, WhatsApp discussions, and observational field notes. For data analysis, MAXQDA 24 was utilized, and results from thematic analysis revealed six related themes: relational foundations of reflection, ICT as connective tissue, AI both as a supporter and a distractor, professional identity renewal, contextual constraints and inequities, and cultural translation of technology. The findings indicate that the synergistic integration of human and AI-mediated reflective practice can enhance teacher learning, agency, and resilience, underscoring the need to thoughtfully incorporate relational, cultural, and structural conditions. Implications for teacher education, policy, and AI-supported PD design are discussed.

Introduction

Developing effective and modern professional development (PD) programs for language teachers has proved challenging, most notably, within the realm of teaching English as a foreign language (TEFL), where teachers need to face the complexities of linguistic, cultural, and pedagogical aspects (Sifakis & Sougari, 2003). In educational settings like Iran, EFL teachers are additionally challenged by a centralized and rigid curriculum, particular socio-cultural standards, and systemic inconsistencies in resources, all of which confound the application of effective PD (Safari & Rashidi, 2015). Previous PD models, often described as transmission-based workshops or top-down seminars, have been heavily criticized for their failure to generate longstanding, functional modifications in classroom practice (Borg, 2018; Darling-Hammond, 2016). These modes of PD regularly focus on theoretical or decontextualized content rather than the situated realities of teachers' classrooms, leaving teachers with knowledge that is challenging to put into practice

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(Borko, 2004; Webster-Wright, 2009). Consequently, the theory-practice gap persists as a structural weakness in teacher learning across educational systems.

Reflective practice has emerged as a fundamental concept in modern teacher education (Asregid et al., 2023). Instead of seeing teachers as passive recipients of expert knowledge, reflective practice considers them to be active participants in their own learning (Harford & MacRuairc, 2008). Teachers are actively engaged in their own instructional beliefs, assumptions, and practices and can probe their professional identities and instructional approaches with greater autonomy and agency (Farrell, 2015; Schön, 1983). Research studies have shown that reflection becomes more meaningful when it occurs within collaborative settings, where teachers gather to discuss and explore ideas cooperatively (Arefian et al., 2025). Collaborative reflective practice (CRP), when mainly rooted in communities of practice (CoPs), offers a framework for teachers to challenge each other's assumptions, exchange strategies, and co-construct knowledge (Mann & Walsh, 2017; Wenger, 1998). These approaches help diminish the sense of professional isolation that many teachers encounter, while also supporting the group's general expertise and effectiveness.

The digital age has transformed the landscape of CRP. Information and communication technology (ICT) tools have provided teachers with new modes of asynchronous and synchronous collaboration, transcending the boundaries of time and location. Digital platforms such as Telegram, WhatsApp, and Skype, along with online discussion tools, have offered teachers with exceptional opportunities to share ideas and experiences, collaboratively examine classroom challenges, and maintain professional conversation beyond the boundaries of their schools (Trust et al., 2016). The rise of these platforms has proven that reflection can flourish in digital environments, generating new ecosystems for teacher learning that extend beyond the conventional boundaries of CoP.

More recently, the advent of Artificial Intelligence (AI), particularly generative AI tools like ChatGPT, has opened up new opportunities for professional learning. These tools can provide immediate feedback, present different perspectives, and offer prompts for reflection or make suggestions for developing lesson plans (Arefian et al., 2024; Huda & Khanum, 2025; Kohnke et al., 2023). AI systems can serve as ubiquitous partners in reflection, offering resources and ideas that teachers might not otherwise provide, particularly in settings with limited resources. The potential of AI to function as a "reflective peer" has, therefore, sparked significant interest in incorporating it into PD models. However, integrating AI into teacher learning poses several challenges. Various factors, including algorithmic bias, cultural relevance, data privacy, and teacher autonomy, should be considered while integrating AI into education (Selwyn, 2019; Zembylas, 2020). Given its limited technological infrastructure and policy frameworks, Iran's educational system must approach AI integration with deliberate consideration. Iranian teachers also need to learn to grapple with unreliable internet access, diverse levels of digital literacy, and a lack of institutional guidance around AI integration. Besides, cultural norms such as hierarchy, authority, and gender dynamics can impact on how teachers participate in both human and AI-mediated reflective practices. Therefore, AI should not be viewed as a universal solution, but rather as a context-sensitive tool shaped by cultural and institutional realities.

Existing literature indicates a growing interest in reflective practice, ICT-enhanced collaboration, and AI in education (Kumar et al., 2024). However, a huge gap remains in understanding how these approaches can be synergistically combined into a strong PD model. Specifically, further research is needed to show how teachers experience the incorporation of class-based reflection, digitally mediated collaboration, and AI-driven reflective support, or how

contextual factors influence the application of such models in under-researched contexts like Iran. To address this gap, this present study probed into the lived experiences of Iranian EFL teachers who engaged in a PD initiative planned around the synergy of class-based, ICT-oriented, and AI-mediated collaborative reflective practice. This study was guided by the following two research questions:

1. How do novice and experienced EFL teachers perceive the incorporation of class-based, ICT-oriented, and AI-driven collaborative reflective practices within a community of practice?
2. How do cultural, institutional, and contextual factors in Iran mediate the implementation and effectiveness of this synergistic approach to collaborative reflective practice?

This study was grounded in sociocultural theory (Vygotsky, 1978), which views learning as a socially mediated process in which tools, artifacts, and interactions with others influence mental and professional growth. Within this framework, ICT tools and AI systems are treated as mediating artifacts within teachers' professional learning environments. By combining sociocultural theory with narrative inquiry, the research offers a detailed account of how human and AI-enhanced collaboration intersect to influence teacher learning within a specific cultural milieu.

Literature Review

From Individual Reflection to Collaborative Reflective Practice

The basics of reflective practice in education can be traced back to John Dewey, who presented reflection as a purposeful and deliberate form of inquiry. Dewey (1933) conceptualized reflection as the "reflection is the active, persistent, and careful consideration of any belief or supposed form of knowledge in light of the grounds that support it" (p. 9). This primary definition placed reflection as a vital constituent of PD, motivating teachers to analytically explore their own assumptions. Expanding on Dewey's thoughts, Schön (1983, 1987) proposed a more practice-oriented framework, dichotomizing reflection-on-action and reflection-in-action. Reflection-on-action includes looking back and analyzing instructional experiences after they happen, but reflection-in-action underscores the ability to think and change while actively engaged in practice. Schön's work has been instrumental in teacher education, mainly in stressing the professional artistry of practitioners exploring uncertain and complex phenomena. For several decades, reflective practice has often been used as a largely individual endeavor, frequently implemented by means of lesson diaries, reflective journals, or personal portfolios (Griggs et al., 2018). While these methods guided teachers to record and probe their personal and professional experiences, they also ran the risk of reducing reflection to a solitary, inward-looking activity (Farrell, 2015). Over time, Scholars realized that teaching was a socially embedded activity, and that reflection became more meaningful and effective when incorporated into dialogic and collective activities. This movement paved the way for what is now known as CRP.

CRP draws on Wenger's (1998) concept of CoPs, social groups bound together by shared engagement, joint aims, and a common repertoire of practices. Within such CoPs, teachers develop "mutual engagement" through dialogue, peer observation, and collective problem-solving. By putting implicit knowledge into explicit knowledge and subjecting it to collaborative reflections, CRP supports teachers to explore their actions and the reasons behind those actions. This form of reflection nurtures PD, reinforces distributed leadership, and alleviates the isolation (Hargreaves & Fullan, 2012; Mann & Walsh, 2017). Empirical studies have highlighted the benefits of CRP.

For example, Farrell (2024) found that teachers engaged in planned peer conversation were more likely to foster nuanced instructional reasoning than those working alone. Moradkhani (2019), studying Iranian EFL teachers, discovered that CRP nurtured greater understanding of cultural and institutional affecting pedagogy. These findings underscore CRPs' potential to bridge the theory-practice gap and to facilitate the engagement of communities capable of facing institutional and contextual challenges.

ICT-Mediated Professional Development and Reflective Practice

The rapid growth of digital technologies has transformed the possibilities for CRP, creating digitally mediated ecosystems for professional discussion. ICT tools, such as social media, messaging applications, and learning management systems, have empowered teachers to sustain professional learning networks that move beyond the physical and temporal restrictions of schools. These platforms not only increase access but also strengthen multimodal interactions that augment the reflective process. Teachers, for example, can share video lessons, refer to student work collaboratively, and involve in asynchronous discussions that permit time for deeper analysis (Li & Walsh, 2023).

Previous research has revealed that digitally mediated CRP can improve teacher autonomy and agency (e.g., Hubbard, 2023; Trust et al., 2016; Zohrabi & Ahmadpour, 2025). For example, Trust et al. (2016) found that learning networks on Twitter could empower teachers to exchange resources in groups, construct insights collectively, and participate in critical conversation together. Likewise, Hubbard (2023) contended that virtual collaborations, when arranged effectively, offered similar benefits as face-to-face CoPs, such as reciprocal support and joint problem-solving. In situations where teachers encounter geographic isolation or professional marginalization, ICT-mediated collaboration can offer critical channels of support and connection.

Regardless of the potential of digitally mediated CRP, important challenges persist. Banegas et al. (2013) cautioned that without thoughtful facilitation, online reflective spaces can easily turn into shallow exchanges of resources rather than meaningful, critical engagement. These challenges are further caffected by digital divides in access to reliable internet and enough devices, mainly in resource-limited settings (Benegas, 2015). Likewise, the constant nature of online discussion can lead to information overload by putting pressures on teachers to engage continuously. These restrictions highlight the requirement for considerate incorporation of ICT into reflective practice models that balance accessibility.

Artificial Intelligence as a Mediator of Teacher Reflection

The latest development in teacher education is the integration of AI into reflective practices. Large language models (LLMs), including ChatGPT, signify an important breakthrough in digital mediation, moving beyond platforms that merely facilitate human-to-human interaction and use tools that can actively participate in the reflective process itself (Zohrabi, 2023). AI systems can offer immediate feedback, produce prompts that boost critical thinking, simulate classroom situations, and analyze large datasets such as student performance records or classroom transcripts (Esfandiari & Arefian, 2025).

Arefian et al. (2024) emphasized that Iranian teachers who used ChatGPT found it as a supportive and, at the same time, a disruptive partner. Novice teachers believed that AI could work as a supporter, providing planned guidance and improving feelings of professional isolation. On

the other hand, experienced teachers viewed it as a critical peer, challenging engrained practices and prompting the reexamination of teaching assumptions. Montenegro-Rueda et al. (2023) additionally underlined the democratizing affordance of AI, noting that teachers in distant or under-resourced contexts could gain access to a form of expertise formerly inaccessible to them.

In spite of this capacity, scholars have raised concerns in using AI chatbots. Holliday (2022) claimed that AI suggestions were often driven by Western-centric instructional assumptions that might not support local cultural or curricular environments. Selwyn (2019) raised wider ethical concerns concerning data privacy, surveillance, and the risk of deprofessionalization. Zhai et al. (2024) cautioned against the dangers of over-reliance on AI, stating that excessive reliance on AI conversation systems could constrain teachers' autonomous critical capacities. These criticisms imply that AI should not be replaced for human collaboration, but it should serve as a tool that facilitates present reflective practices.

The Iranian Context: Cultural, Institutional, and Policy Considerations

While previous literature offers valuable insights into reflective practice, ICT-supported collaboration, and AI in teacher learning, the specificities of national and cultural contexts cannot be overlooked (Yang & Hong, 2024). Within Iranian teacher education context, teacher development is influenced by a highly centralized education system that requires prearranged curriculum, assessment, and teaching approaches (Nazari, 2025). Teachers often face substantial workloads, insufficient resources, and institutional pressures that prioritize obedience over innovation and experimentation. However, Iranian teachers have demonstrated professional resilience and creativity, often forming informal networks and localized strategies to tackle systemic constraints.

Studies on teacher development in Iran underscore both opportunities and barriers for innovative PD models. Moradkhani (2019), for instance, found that teachers embraced collaborative reflection but were inhibited by hierarchical norms that impeded open critique, mainly across levels of seniority. Similarly, Esfandiari and Arefian (2024) found that Iranian teachers successfully used social media for collaborative assessment literacy development, but digital inequities and policy limitations restricted teachers' involvement. These findings highlight that any effort to integrate ICT or AI into PD must address local realities, including infrastructural differences, socio-cultural potentials, and institutional regulation.

Identifying the Research Gap

The previous literature, as reviewed in the previous sections, reveals that reflective practice has transferred from an individual attempt to a collaborative, technology-mediated, and progressively AI-supported process (Liu et al., 2025). Empirical evidence shows the advantages of each modality, class-based CRP, ICT-mediated collaboration, and AI-driven reflection. Nevertheless, the interaction among these modalities remains underexplored, particularly in settings such as Iran where institutional and cultural features profoundly shape PD. More specifically, there is restricted empirical research exploring how teachers experience the synergy of human and AI-mediated reflection within CoPs, or how contextual dynamics in under-researched settings like Iran influence the application and results of these models. This study investigated this gap by providing a narrative inquiry into Iranian EFL teachers' experiences of a synergistic PD model that integrated class-based, ICT-oriented, and AI-driven CRP.

Method

Research Design and Philosophical Orientation

The current study used a qualitative exploratory design, framed through the methodological lens of narrative inquiry. Narrative inquiry is founded on the ontological assumption that human experience can be recounted; people make sense of their lives and professional worlds by constructing and sharing narratives (Clandinin & Connelly, 2004). For teacher development research, narrative inquiry offers a particularly suitable approach because it focuses on teachers' voices and clarifies the ways in which professional identity, reflection, and development are rooted in temporal, social, and physical settings. In contrast to more positivist designs that seek generalizations, narrative inquiry intends to capture the nuanced and subjective lived experiences of participants, providing a textured understanding of professional development processes.

Theoretically, this study was grounded in sociocultural theory (Vygotsky, 1978), which views learning as mediated by cultural tools, social interaction, and involvement in communities. From this perspective, tools including digital platforms and AI are understood not as neutral instruments but as mediating artifacts that influence understanding and professional practice. By embracing this viewpoint, the study conceptualized class-based reflective dialogues, ICT-mediated interactions, and AI-driven meetings as distinct yet interrelated mediators within teachers' professional learning ecosystems. The relationships between these mediators were central to the research questions. The exploratory nature of the research was essential because the incorporation of class-based, ICT-oriented, and AI-driven collaborative reflective practice is under-theorized and under-researched in the Iranian context. Instead of testing hypotheses, the study aimed to document teachers' experiences, monitor the meanings they built, and produce perceptions into how context and culture mediated their involvement.

Participants and Setting

The study included 30 Iranian male and female EFL teachers teaching in public junior high schools across various districts of Tehran. Participants were employed through purposive sampling to maximize variation in terms of instructional experience, gender, age, digital literacy, and school resource settings. Half of the participants were novice teachers with fewer than five years of professional experience, whereas the other half were experienced teachers with more than 10 years in the classroom. Their age ranged from 24 to 52 (M = 34, SD = 6.94). Half. Their academic backgrounds ranged from bachelor's degrees in English Language Teaching (70%) to master's degrees in Applied Linguistics (30%). Table 1 provides detailed information about the participant and the setting.

The participating schools also mirrored substantial deviation in infrastructural resources. Some were quite well-resourced urban institutions equipped with strong internet connections, computer laboratories, and administrative cultures. Other settings were under-resourced schools, where teachers often had to depend on personal devices and struggle with sporadic connectivity. This heterogeneity was essential for the study, because it helped the researchers to examine how infrastructural inequities and institutional conditions influenced teachers' engagement with the PD model.

Teachers were divided into three CoPs, each including a combination of novice and experienced teachers. The CoPs functioned as collaborative, teacher-led groups, while the researcher offered facilitation throughout the initial stages to establish norms of trust and mutual

support. Throughout the course of nine months, the CoPs were involved in iterative cycles of class-based, ICT-oriented, and AI-mediated reflection, enabling longitudinal observation of their developing professional narratives.

Ethical approval for the study was obtained from The Ministry of Education. All participants were provided with thorough information about the purpose of the research, the voluntary nature of their involvement, and their right to withdraw whenever they wanted without any consequences. Written informed consent was collected prior to data collection. To preserve confidentiality, we used pseudonyms, and all the digital data (WhatsApp discussions and ChatGPT logs) were anonymized and saved on password-protected devices.

Table 1

Background Information Related to the Participants and Setting

Demographic feature	Description
Number of participants	30
Nationality & role	Iranian EFL (English as a Foreign Language) Teachers
Setting	Public junior high schools across various districts of Tehran, Iran.
Sampling method	Purposive sampling (to maximize variation)
Age range	24 to 52 years of age
Mean age (SD)	34 years (± 6.94)
Gender Distribution	15 male (50%), 15 female (50%)
Teaching experience	Novice: 15 teachers (<5 years) Experienced: 15 teachers (>10 years)
Academic degree	Bachelor's in ELT: 21 teachers (70%) Master's in Applied Linguistics: 9 teachers (30%)
Inferred L1 (First Language)	Persian (Farsi)
School resource variation	From well-resourced (good internet, computer labs) to under-resourced (reliance on personal devices, sporadic connectivity)
Professional community structure	Divided into three communities of practice (CoPs), each with a mix of novice and experienced teachers

The Synergistic PD Intervention Model

The 9-month PD intervention was planned as an incorporated, cyclical process integrating class-based, ICT-mediated, and AI-driven reflection into teacher-led communities of practice (CoPs). The model functioned through structured **bi-monthly cycles**, each spanning around six weeks and following a regular pattern as described below:

Phase 1: Classroom Inquiry and Individual Reflection (Weeks 1-2)

Teachers acknowledged a principal area or challenge from their own junior high school EFL classrooms (e.g., engaging unwilling learners, teaching grammar communicatively, and managing mixed-ability groups). They taught related lessons and gathered initial data, which could comprise student work samples, personal notes, or brief lesson videos. Teachers then involved in

initial **individual reflection**, writing a short reflective essay supported by prompts including, *"Describe the challenge you chose. What was your initial approach, and what were your observations?"*

Phase 2: AI-Mediated Dialogue (Week 3)

Teachers took their initial reflections and classroom data to an AI tool (ChatGPT). They were trained to implement AI as a critical thinking partner, not a solution provider. Particular recommendations included prompting AI to analyze their described situations from diverse instructional perspectives, produce alternative pedagogical strategies for their context, or pose challenging questions to deepen their analysis. Example prompts were offered (e.g., *"Based on the classroom scenario I described, what are two alternative instructional strategies I could consider, and what might be the potential drawbacks of each in a large public school class?"*). Teachers documented these AI interactions in their logs.

Phase 3: ICT-Mediated CoP Discussion (Week 4)

The AI-produced ideas and teachers' thoughts became the basis for asynchronous discussion in their dedicated **WhatsApp groups**. A facilitator (the researcher, in the initial cycles) posted a synthesizing question to launch the conversation (e.g., *"How did AI's suggestions align with or challenge your initial thinking? Which ideas seem most adaptable to our Iranian classroom realities?"*). Teachers shared their AI logs, debated interpretations, and provided contextualized advice to peers encountering similar challenges. This phase highlighted collective sense-making and cultural translation of AI-generated suggestions.

Phase 4: Face-to-Face CoP Meeting & Action Planning (Week 5-6)

Each cycle culminated in a **90-minute, face-to-face CoP meeting** held at a central school or university facility. These sessions had a structured agenda as follows: (a) exchanging main ideas from the WhatsApp discussions, (b) collaborative, deep analysis of one or two particular cases by means of video or lesson materials brought by members, and (c) planning revised instructional actions for the next cycle. **Facilitation** was primarily researcher-led to model dialogic and reflective protocols. Over nine months, facilitation responsibilities were progressively distributed to experienced teacher-volunteers within each CoP, nurturing ownership and shifting the researcher's role to that of a participant-observer and resource provider.

Phase 5: Integration and Iteration

Teachers then implemented their revised plans in their classrooms, effectively introducing the next cycle. Over nine months, the group completed about **five full cycles**. The boundaries for AI use were explicitly discussed in the initial training: AI was implemented as a reflective catalyst and idea generator, with all outputs subject to critical evaluation by the teacher and the CoP for contextual and cultural appropriateness. Teachers were warned against using AI to produce finished lesson plans or materials for direct, unreflective classroom application.

Data Collection

Data collection was guided by the principles of narrative inquiry, underscoring temporality, sociality, and place. In order to understand teachers' developing experiences across time, we gathered various modes of qualitative data at different stages of the PD process. At the beginning, in the middle, and at the end of the 9-month period, the teachers participated in life-story interviews. These unstructured interviews motivated them to reconstruct their professional journeys, state their instructional values, and narrate their experiences of the synergistic PD model.

By concentrating on turning points, problems, and resolutions, these interviews enlightened how teachers understood transformations in their professional identities and practices over time. Besides interviews, the participants created reflective essays at three strategic intervals. These essays were guided by prompts designed to stimulate deeper engagement with their experiences, helping teachers to articulate perceived development, challenges, and developing philosophies of instruction. The reflective essays were particularly valuable for tracing the individual cognitive and emotional dimensions of development.

To ensure consistency, the researchers provided the teachers with supportive prompts throughout the reflective essay writing and AI collaborations. For example, one reflective essay prompt requested: *"Describe a new classroom challenge and describe how your thinking about it has changed through participation in your CoP."* Likewise, when involving with ChatGPT, teachers were stimulated to use prompts including: *"Suggest different ways to manage a mixed-ability classroom while preserving student engagement."* These examples illustrated the types of scaffolding to stimulate meaningful reflection and to ensure comparability across participants' contributions.

A substantial portion of data was collected from digital artifacts that documented teachers' participation in ICT-mediated and AI-driven reflective practices. The WhatsApp groups generated a large corpus of text-based discussions, including exchanges of ideas, expressions of support, and shared problem-solving around classroom incidents. These transcripts offered evidence of the ways in which teachers cooperated in asynchronous digital spaces, and they emphasized the immediacy and continuity of peer support. Likewise, participants' ChatGPT communication logs were gathered. These logs captured teachers' direct engagements with AI, comprising the reflective prompts they posed, the responses they obtained, and the ways they integrated AI-produced recommendations into their practice. This dataset offered unique insights into how teachers viewed AI as a reflective partner. Lastly, observational field notes were collected by the lead researcher throughout early training sessions and intermittent face-to-face CoP gatherings. These notes documented group dynamics, nonverbal communication, and the delicate nuances of teacher communication that were not always obvious in the textual data. Together, the reflective essays, interviews, digital artifacts, and field notes produced a triangulated and temporally layered dataset that conveyed the complexity of teachers' experiences.

Data Analysis

The analysis adopted a hybrid approach, incorporating narrative and thematic strategies to honor both the storied nature of teachers' experiences and the need to recognize cross-cutting patterns across 30 participants. This approach is consistent with narrative inquiry's commitment to social, temporal, and place-based dimensions (Clandinin & Connelly, 2004), while software-assisted thematic analysis can systematically organize a large, multi-source dataset. The analytic process was iterative and abductive, extending between the granularity of coded data and the holistic form of teachers' stories. MAXQDA (version 24) was applied for systematic familiarization and inductive-deductive coding of the whole corpus. Code frequencies and co-occurrence maps functioned a particular, limited purpose: They worked as 'analytic signposts', emphasizing which concerns, experiences, or concepts were pervasive or salient across the dataset.

Following this thematic mapping, the analysis shifted decisively to narrative modes. Integrating the codes and memos produced in MAXQDA as anchors, we returned to the raw data to construct and analyze teachers' narratives. This involved recognizing narrative elements within individual accounts: plotlines (e.g., a journey "from isolation to companionship" with AI),

important metaphors (e.g., AI as a "co-teacher" or "distractor"), critical incidents, and resolutions. We paid close attention to how teachers structured their professional identities over time within the socio-cultural context of Iran. The thematic patterns (e.g., "relational foundations," and "cultural translation") formed the basis on which these narratives were understood. The analytic process started with recurrent readings of reflective essays, WhatsApp discussions, ChatGPT logs, interview transcripts, and field notes. The data, then, were coded through both deductive and inductive strategies. Deductive codes were based by the theoretical framework and the research questions, focusing on categories like "observed benefits of AI," "peer support," "contextual constraints," and "teacher agency." Inductive codes appeared progressively from participants' narratives, encompassing recurrent themes like "feeling left behind," "secret networks," or "renewed purpose."

MAXQDA allowed the occurrence of codes to be pursued across the dataset. For instance, the code "digital divide" appeared 78 times across the corpus, mainly in WhatsApp transcripts and interviews. The theme "AI as scaffolding" recurred 58 times, mainly in the reflections of novice teachers, while the code "AI as distractor" occurred 42 times, mainly in the narratives of experienced teachers. Such frequency counts helped to illustrate the relative weight of definite experiences and insights across groups. Themes were regularly developed by gathering associated codes and reviewing them across diverse data sources. For example, codes based on "trust," "psychological safety," and "face-to-face interaction" merged into the theme "relational foundations of reflection."

Narrative analysis techniques were also used to investigate how teachers structured their stories. Attention was given to plotlines, turning points, metaphors, and resolutions within individual narratives. For instance, one teacher described her engagement with ChatGPT as a journey "from isolation to companionship," regarding AI as a character in her professional story. To guarantee credibility, primary interpretations were consulted with participants through member checking. To improve trustworthiness, numerous strategies were used beyond member checking. Credibility was strengthened by means of triangulation of data sources. Transferability was reinforced by offering the thick description of the environment and participants. Dependability was addressed by preserving an audit trail of coding decisions, analytic memos, and modifications to the coding framework across time. Confirmability was improved through reflexive journaling and peer debriefing.

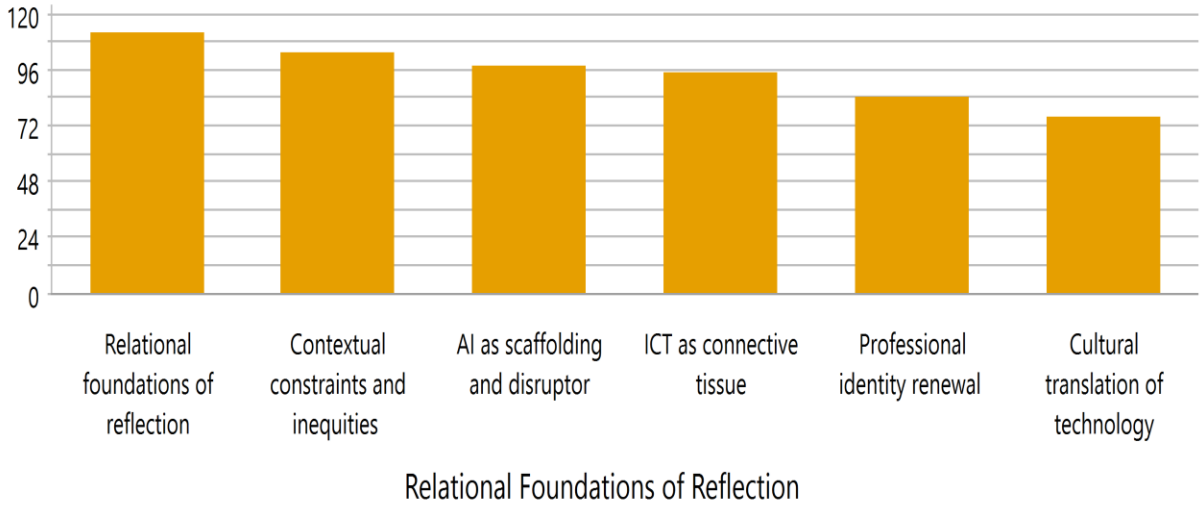
Results

Exploring the First Research Question: *How do novice and experienced EFL teachers perceive the incorporation of class-based, ICT-oriented, and AI-driven collaborative reflective practices within a community of practice?*

The analysis of the dataset through MAXQDA revealed six main themes: (1) relational foundations of reflection, (2) ICT as connective tissue, (3) AI both scaffolding and disruptor, (4) professional identity renewal, (5) contextual constraints and inequities, and (6) cultural translation of technology. The general frequency counts of different codes appeared within each theme in **Figure 1**.

Figure 1

Relational Foundations of Reflection



Relational Foundations of Reflection

The most frequently coded theme concerned the relational foundations of reflection, with 112 instances. The teachers emphasized that trust and psychological safety within their CoPs were fundamental for honest dialogue and experimentation. Many teachers remarked how encouragement from peers allowed them to acknowledge weaknesses and exchange challenges without the fear of judgment. For instance, one novice teacher elucidated that the WhatsApp group felt like a "safe corner" where she could openly share her struggles: "*I could try new grammar teaching strategies, because I realized that my colleagues could support me during my instructions"* (T18-Interviews). MAXQDA's code co-occurrence analysis indicated a strong intersection between "trust" and "professional risk-taking," representing that supportive peer relationships permitted greater experimentation with instructional strategies.

The second theme, coded 95 times, highlighted the role of ICT as connective tissue for reflective conversation. Teachers respected the immediacy and continuousness afforded by platforms such as WhatsApp and Telegram. These tools permitted reflection to move beyond formal sessions, generating a constant cycle of professional discussion. One participant stated that "*In the past, reflection ended when the workshop ended. Now, our discussion continues at night, in the morning, every time something occurs"* (T2-Reflective essays). The code "anytime support" underlined this theme (58 instances), pursued by "digital solidarity" (25 instances). However, some teachers also voiced concerns about "digital fatigue" (12 instances.

AI tools including ChatGPT were coded in 98 examples, generating extremely various perceptions. Novice teachers normally viewed AI as a helpful partner, proposing immediate instructional recommendations that improved their confidence. For example, one teacher described "*AI as a colleague available immediately"* (T8-Reflective Essays). Another novice teacher stated that "*ChatGPT gave me a starting point when I felt entirely stuck on how to present a new tense*" (T22-Interview). On the contrary, experienced teachers regularly regarded AI as a disruptor, underscoring its propositions either misaligned with local context or overly authoritative. A concrete episode demonstrating this disruption was narrated by one of the teachers. In his interview, he asked ChatGPT to teach the passive voice. AI proposed a complex role-play including a crime scene investigation—an activity he discovered culturally inappropriate and logistically impossible in his classroom. "*It wasn't just unhelpful,*" the teacher explained, "*It forced me to defend my own practice. Why don't I do such activities? It made me articulate the limitations of my setting—the exam pressure, the class size—but also question if I was hiding behind those*

restrictions. It disrupted my routine thinking" (T14-Interview). This encounter, later discussed in his CoP's WhatsApp group, triggered a vigorous debate on balancing communicative ideals with systemic realities. This divergence is evident in the MAXQDA frequency charts: "AI as scaffolding" was coded 56 times, mainly among novice teachers, while "AI as disruptor" appeared 42 times, mainly among experienced teachers.

Eighty-four coded segments reflected professional development manifested as enhanced agency, confidence, and resilience. T25, for example, pointed out that: "*I was more confident as I was supported by others and AI. I could delve into new teaching practices and enhance my skill and knowledge continuously. So, I could stay more in the profession"* (reflective essays). Teachers reconsidered their sense of purpose, with one participant describing the mutual reflective practice model as "*a complementary source for teaching practices"* (T10- AI interaction logs). Word frequency analysis from MAXQDA strengthened this theme, with terms including *confidence, purpose,* and *voice* recurring frequently across interviews and reflective essays: "*During these practices, I found myself and listened to my own voice. Previously, I was a listener but now I take more decisions and think more creatively and critically"* (T27-interviews). Similarly, another teacher declared: "*Thank you ChatGPT! You directed and guided me towards a more effective teaching approach"* (AI interaction logs).

One hundred and three coded segments underscored systemic obstacles. During the observation, field notes revealed that "*teachers emphasized inequities in digital access, unstable internet connections, and unpredictable institutional support"* (T7-observational field notes). Some participants described by using personal data plans to be active in the WhatsApp groups, whereas others temporarily gave up because of technological problems. Institutional limitations, for example, blocked platforms or constrained administrative backing. The source analysis in MAXQDA showed that references to restrictions were most frequently used in interviews (40 instances), followed by WhatsApp transcripts (35), and reflective essays (28).

Finally, 76 coded segments focused on the cultural aspect of ICT and AI tools. Teachers commonly described modifying AI-generated materials to fit local curriculum needs and classroom realities. While some teachers claimed that AI outputs felt "Westernized," many other teachers treated them as raw materials to be reorganized. The process of cultural translation is demonstrated by T9's experience, who explained in her CoP's WhatsApp group that ChatGPT produced a reading comprehension text about "Thanksgiving dinner." She clarified her adaptation as follows: "*I kept the grammatical structure and question types, but I improved the topic to 'Eid al-Fitr visit,' which is familiar to all my students. The AI's questions were about 'the main course,' so I improved it to 'the special dishes' we prepare. This way, the instructional goal is met without the cultural confusion*" (T9-WhatsApp Log). This log was tracked by peers exchanging similar adaptations—substituting "baseball" with "volleyball," or "job interviews" with "university entrance exam interviews"—establishing a collective practice of localizing content. This translational process underscores the non-neutrality of technology and highlights teacher agency in adapting tools to be instructionally and culturally appropriate.

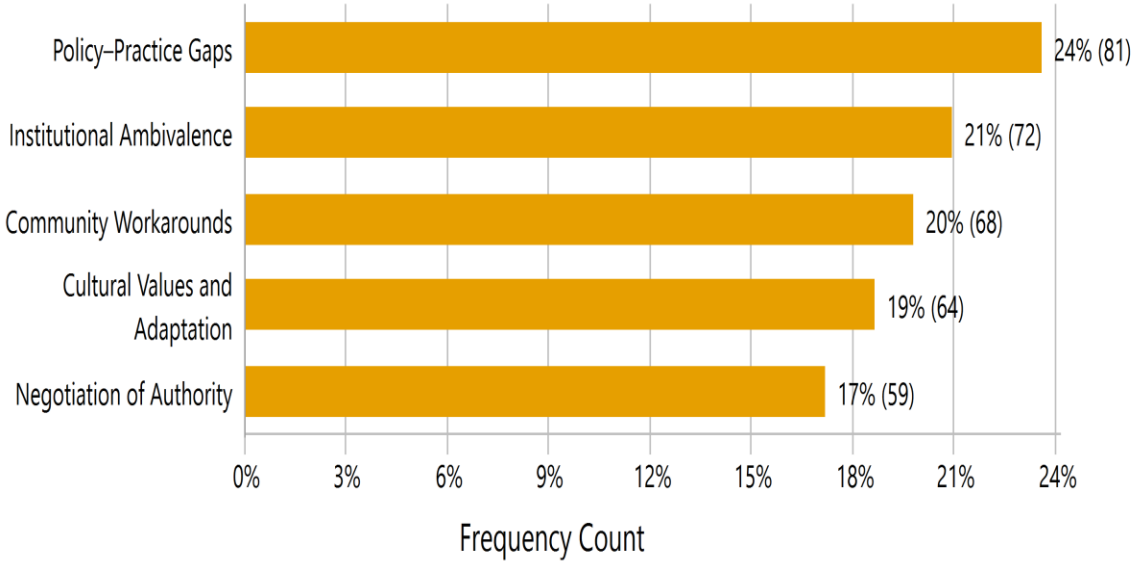
Exploring the Second Research Question: *How do cultural, institutional, and contextual factors in Iran mediate the implementation and effectiveness of this synergistic approach to collaborative reflective practice?*

MAXQDA analysis showed that teacher engagement was influenced not only by personal attitudes towards technology but also by wider contextual and institutional forces**.** Five themes, as shown in Figure 2, appeared: (1) institutional ambivalence, (2) policy–practice gaps, (3) cultural

values and adaptation, (4) negotiation of authority, and (5) resilience through community workarounds.

Figure 2

Frequency of Codes Reflecting Contextual and Institutional Influences



Teachers characterized institutional responses to ICT and AI integration as inconsistent or mixed. While ministries and schools emphasized modernization, teachers reported a persistent lack of resources, restricted training, and minimal structural support. As one of the teachers noted, "*They talk about digital revolution, but in practice, we purchase our personal tools and pay for our own internet"* (T15- WhatsApp discussions). MAXQDA frequency counts presented 72 instances coded under "institutional ambivalence," most deeply gathered in interview transcripts.

The most frequently coded institutional theme (81 instances) was the policy-practice gap. Teachers underscored pressure to adopt creative practices while concurrently being limited by rigid curricula and assessment systems. T5, for example, commented that "*I feel pushed to have more creativity and innovation, but my hands are restricted by strict assessment necessities"* (WhatsApp discussions). In several cases, AI-produced notions were believed "too creative" to fit exam-oriented lessons. As one teacher explained, "*AI could not realize my contextual factors, so I think that we need to respect the contextual needs, interests, and regulations while receiving help from an AI system"* (T1-Interviews).

Sixty-four coded segments illustrated how teachers negotiated the integration of ICT and AI within existing cultural and moral norms. Respect for authority and collectivist values were seen both as supporting and limiting factors. On the one hand, collectivism fostered CRP; on the other hand, undue deference to tradition sometimes discouraged innovation and exploration. Word frequency analysis from MAXQDA revealed repeated emphasis on *respect* (22 mentions), *responsibility* (18 mentions), and *adaptation* (14 mentions), underlining how cultural alignment was vital to teachers' acceptance of AI and ICT. One of the teachers uttered the following words in this regard: "*In our own culture, we are trained to respect experts and seniors; thus, I am*

sometimes tempted to challenge traditional methods, even when AI proposes rather innovative and novel methods" (T11-Interviews). Similarly, another teacher pointed out that "*I've learned to adjust AI tools in ways that preserve our shared values, so students perceive technology as supportive instead of disruptive"* (T3-Reflective essays).

Fifty-nine instances highlighted evolving perceptions of authority within classrooms and professional communities. The teachers reflected on how AI blurred limitations between teacher expertise and machine-produced recommendations. In this regard, T14 noted that "*at times I feel like AI identifies the answer better than I do. I worry my students will start trusting it more than me"* (WhatsApp discussions). Such concerns were also raised in reflective essays. One of the teachers uttered the following words: "*My authority came from possessing the knowledge. Now knowledge is everywhere, even in a chatbot. I am learning that my new role is the guide who helps them [students] question and contextualize that information*" (T17-reflective essay). Some teachers stated that students might start to see AI as more authoritative than their teachers, while others incorporated AI as a co-teacher. MAXQDA's code relation browser showed frequent overlap between "AI authority" and "teacher identity," proposing that identity negotiations were at the core of this tension. Another teacher admitted that "*I've used AI recommendations along with my lessons—it's like possessing a co-teacher in the class. Students still listen to me; however, the AI provides a creative outlook"* (T6-Observation field notes).

Finally, 68 coded segments highlighted teachers' resourcefulness in circumventing institutional and technological constraints. Examples comprised means of VPN to access blocked platforms, using other resources for internet access, and developing informal WhatsApp-based "mini-curricula." Teachers enclosed these strategies as acts of professional resilience, guaranteeing continuity of reflective conversation in spite of systemic boundaries. One teacher elaborated on this ethos clearly: "*If the door is closed, we open the window. If the window is closed, we talk through the wall"* (T13-Interviews).

Discussion

This study explored the experiences of Iranian EFL teachers involved in a synergistic PD model incorporating class-based, ICT-mediated, and AI-driven CRP. The findings reveal a complex interplay between relational, technological, and contextual factors, representing both the potential and restrictions of incorporating human and AI in teacher learning. Relational basics were central to meaningful reflective practice, with psychological safety, trust, and peer support identified as fundamental prerequisites for effective dialogue, risk-taking, and innovation. The teachers stated that encouragement from peers enabled them to recognize weaknesses and exchange challenges without the fear of judgment, which confirms prior research on the social nature of teacher learning (Farrell, 2024: Wenger, 1998). The relationship between trust and professional risk-taking highlighted the synergistic role of supportive communities in helping teachers to challenge assumptions and renovate instructionally.

ICT appeared as a vital connective tissue in supporting reflective conversation across time and space. Platforms like WhatsApp and Telegram moved reflection beyond formal sessions, contributing to continuous, asynchronous professional conversation. Although these tools enhanced accessibility and immediacy, the participants also reported "digital fatigue," highlighting the need to balance constant connectivity with sustainable engagement. These findings support previous studies on online professional learning networks (Li & Walsh, 2023; Trust et al., 2016) and lengthen them by demonstrating the interaction of ICT-mediated and AI-mediated reflection

in resource-limited settings. AI served as a supporter and a disruptor. Novice teachers respected AI-generated prompts and immediate instructional recommendations as support for classroom decision-making, resonating evidence of AI's capacity to democratize access to expertise (Montenegro-Rueda et al., 2023). Conversely, experienced teachers often situated AI as a disruptor, challenging entrenched teaching assumptions or generating suggestions misaligned with prescribed curricula. This polarity highlights the significance of human agency in mediating AI outputs and incorporating them meaningfully into culturally and institutionally appropriate frameworks (Holliday, 2022; Selwyn, 2019).

Teacher engagement was also intensely mediated by institutional, cultural, and infrastructural aspects. Institutional ambivalence and policy-practice gaps constrained innovation, with teachers facing unpredictable support, restricted training, and inconsistent directives. These challenges align with prior research on Iranian teacher development, which identifies centralized curricula and hierarchical norms as both enabling and constraining forces (Moradkhani, 2019). Teachers showed professional resilience through innovative strategies, such as using VPN, sharing internet resources, and producing local WhatsApp-based mini-curricula, guaranteeing continuity of reflective dialogue in spite of systemic obstacles. Cultural values also influenced embracing and variation of ICT and AI tools. While collectivist norms supported CRP, respect for authority sometimes inhibited open critique. Teachers were involved in the cultural translation of technology, adjusting AI-generated materials to align with local curricular expectations and classroom realities. This highlights the non-neutrality of technology and highlights teacher agency in localizing global innovations (Holliday, 2022; Zembylas, 2020).

The integrated PD model fostered significant professional identity renewal, mainly among novice teachers. AI-mediated scaffolding, combined with ICT-supported communities, contributed to a sense of empowerment, enabling teachers to explore both classroom and systemic challenges. By contrast, using AI as a disruptor prompted reflection on professional judgment, emphasizing that carefully calibrating AI's role is vital to preserving teacher autonomy and preventing deprofessionalization (Selwyn, 2019; Zhai et al., 2024). The sustainability of such synergistic models depends on addressing digital literacy, infrastructural inequities, and institutional support. Although the model proved effective within heterogeneous communities of practice, sustaining engagement requires attention to workload, access, and the mitigation of digital exhaustion. Scalability also depends on culturally responsive AI design, localized content integration, and alignment with national policy frameworks. These findings suggest that synergistic models linking human and AI-mediated reflection are practicable, but their influence relies on constant support, contextual adaptation, and teacher agency.

Theoretically, this study contributes to exploring teacher learning as a socially and technologically facilitated process. By framing ICT and AI as mediating artifacts within professional learning ecosystems, the study establishes the interdependence of human collaboration and digital augmentation. It extends previous literature by demonstrating how teachers negotiate AI's dual role as a supporter and a disruptor and by underlining the centrality of cultural, relational, and contextual mediation in technologically improved PD. In general, the findings show that the incorporation of class-based reflection, ICT-mediated collaboration, and AI-driven support can enhance PD, identity regeneration, and resilience, provided that contextual and cultural features are widely reflected and teacher agency remains significant.

Conclusion

This study explored Iranian EFL teachers' experiences with a synergistic PD model that incorporated class-based reflection, ICT-mediated collaboration, and AI-driven support. The findings underscore the complex interplay of relational, technological, and contextual factors in shaping teacher engagement, PD, and reflective capability. Relational foundations, comprising trust and psychological safety, emerged as vital prerequisites for meaningful conversation and experimentation, implying that even in digitally mediated and AI-fostered settings, human connections remain crucial. ICT platforms provided continuous reflection and peer support, while AI functioned both as a supporter for novice teachers and as a critical disruptor for experienced teachers, demonstrating the nuanced and context-dependent role of AI in professional learning. The study also highlights the mediating role of institutional, cultural, and infrastructural factors. The teachers navigated institutional ambivalence, policy–practice gaps, and resource inequalities while actively adapting ICT and AI tools to align with local curricular and cultural expectations. These processes reflected teachers' agency and resilience, as well as the need of culturally responsive and contextually grounded approaches to incorporating technology into PD.

The findings have implications for teacher education, policy-making, and localization of technology. For teacher education, the findings highlight the importance of designing PD models that integrate human, digital, and AI-mediated collaboration, nurturing both reflective practice and professional identity regeneration. For policy and school leadership, the findings underscore the need to offer constant institutional support, address infrastructural disparities, and generate environments that help teachers to participate fully in creative PD initiatives. For the development of AI tools in education, the study suggests that technology must be locally adaptable, culturally aligned, and positioned as a complement to, rather than a replacement for, human collaboration.

Although this study offers rich ideas into a synergistic PD model, it is not without limitations. Firstly, its emphasis on a particular group of 30 EFL teachers in public junior high school in Tehran confines the generalizability of the findings. The experiences of teachers in private institutions, rural areas, and other instructional settings may vary considerably. Secondly, the 9-month duration, though substantial, captures only the initial stages of engagement with this integrated model; the long-term sustainability of its benefits and potential evolution of teacher-AI dynamics need longitudinal investigation. Thirdly, the dependence on self-reported data and narratives, though central to the methodology, means the findings reflect perceived changes in practice instead of autonomously measured classroom outcomes. Future research could expand this line of inquiry by including more diverse teacher populations across Iran and other similar contexts. Longitudinal studies tracking teachers over several years would be invaluable for understanding the enduring impact on professional identity and classroom practice. Additionally, employing mixed-methods designs that combine narrative inquiry with classroom observations and analysis of student learning outcomes would offer a more comprehensive evaluation of the model's effectiveness. Lastly, dedicated research into the design and efficacy of culturally modified AI tools and prompts, co-created with local educators, is a vital next step for realizing the equitable potential of AI in teacher development.

In conclusion, the incorporation of class-based, ICT-mediated, and AI-driven CRP provides substantial potential for fostering teacher learning, agency, and resilience. Its success, however, hinges on contextual sensitivity, relational trust, and sustained support. By foregrounding teacher experiences in under-researched contexts like Iran, this study contributes to a deeper

understanding of how human and AI capacities can be synergistically integrated to transform PD and support meaningful, contextually grounded educational innovation.

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