Journal of Critical Applied Linguistics Studies

ORIGINAL RESEARCH
E-ISSN: 2981-1678
Volume 3, Issue 1, pp 1-27

Gonbad Kavous University

Linguistics Society of Iran

A Qualitative Study of AI-Assisted Coaching in Iranian In-service EFL Teachers

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ABSTRACT

Lifelong learning is indispensable for EFL teachers, yet traditional professional development (PD) often fails to be continuous, or personalized. This study explored the potential of AI-assisted coaching to address this gap within under-resourced public schools in Iran. Employing an interpretative phenomenological analysis (IPA) design, the researchers collected the data through semi-structured interviews, reflective journals, and classroom observations from 17 Iranian in-service EFL teachers following a 2-week blended AI coaching workshop. Findings revealed that the teachers perceived that AI tools supported continuous professional development (CPD), by providing tailored feedback, facilitating reflective practice, and empowering data-driven teaching modifications. Challenges included infrastructural inequalities, ethical concerns, and tensions between AI reliance and teacher autonomy. The findings highlight AI's potential as a scaffold for adaptive teaching while stressing the need for culturally responsive, equitable, and teacher-centered AI incorporation. The findings prioritize the development of teacher-controlled AI tools that respect autonomy while offering context-sensitive support.

Article History

Received:
2025-7-6
Revised:
2025-8-20
Accepted:
2025-9-23
Published:
2026-1-1

Keywords:
adaptive teaching practices, AI-assisted coaching, lifelong learning, continuous professional development

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1. Introduction

Lifelong learning has become a keystone of 21st century education, predominantly in fields including language teaching, where methodological revolutions and developing understandings of language acquisition impose continuous professional development (CPD) (Borko, 2004). Traditional CPD approaches, tending to be temporary, decontextualized, and top-down, fail to resolve these problems successfully (Macias, 2017). In English-as-a-foreign-language (EFL) settings like Iran, where such generic, one-shot workshops are often inconsistent with localized classroom realities and curricular limitations, rendering them ineffective for nurturing meaningful, continuous instructional change (Safari & Rashidi, 2015), this problem tends to be more acute. Therefore, teachers are regularly left without the continuous support necessary to translate theoretical knowledge into adaptive instructional practices (Karimi & Norouzi, 2021).

Recent research has shown that effective CPD must be continued, reflective, collaborative, and personalized (Dogan et al., 2025) to individual needs—qualities that AI-assisted coaching can distinctively offer. The affordances highlight a paradigm shift in effective PD, extending from periodic upskilling to a model of lifelong learning that is rooted in practice. As underlined by sociocultural theory (Lantolf & Poehner, 2014) and transformative learning (Mezirow, 2000), development must be a reflective, collaborative, and iterative process where teachers dynamically adjust their expertise to dynamic classroom needs—a concept central to adaptive teaching (Westwood, 2018). By integrating natural language processing (NLP), machine learning, and adaptive feedback mechanisms, AI coaching systems can generate personalized, constant, and situationally pertinent CPD experiences, facilitating teachers to improve their teaching strategies in response to genuine classroom dynamics (Mejeh & Rehm, 2024).

A key aspect of resourceful EFL teaching in Iran is adaptive expertise—the capacity to modify instructional methods adaptively according to learners' dynamic needs (Nazari & Riazi, 2024). Adaptive teaching encourages teachers to evaluate and analyze students' understanding and participation in real-time and have suitable instructional modifications to meet their students' needs (Westwood, 2018). Given the inclusive differences in proficiency, learning styles, and motivation of Iranian students, this skill is critical for generating comprehensive and effective learning environments (Derakhshan & Shakki, 2018). AI-assisted coaching, leveraging machine learning and NLP, can function as a cognitive partner (Huang, 2025), offering the continuous, situated feedback and data-driven analytics that traditional PD lacks. It can scaffold teachers' reflective practice and adaptive decision-making in real-time, providing a potential solution to the persistent gap between theory and classroom practice (Mejeh & Rehm, 2024). In this study, AI-assisted coaching is operationally defined as the application of AI systems (e.g., NLP-driven

platforms and adaptive feedback tools) that provide real-time, data-driven feedback to support teacher reflection and decision-making, equipping teachers with personalized resource recommendations and reflective prompts.

However, increasing adaptive teaching expertise is challenging, mainly when teachers need support systems to help them process numerous classroom variables concurrently. AI-assisted coaching can function as a cognitive partner in this process, providing real-life analytics on student involvement, language accuracy, and engagement, while also proposing research-oriented pedagogical adjustments (Huang, 2025). Significantly, these technologies are not intended to replace teacher judgment but to expand it, producing an augmented intelligence framework where human expertise is developed by data-driven insights (Troussas et al., 2025).

In spite of its potential, the incorporation of AI into teacher CPD poses critical questions concerning availability, ethics, and cultural issues (Mouta et al., 2025). The world digital divide—apparent in inequalities between city centers with strong infrastructure and local parts with incomplete connectivity—poses a substantial challenge to justifiable implementation. Moreover, ethical concerns, including data privacy, algorithmic bias (as many AI systems work with Western-centric datasets), and the danger of technology declining teacher autonomy, must be wisely addressed (Ahmad et al., 2022). For AI-assisted coaching to be effective in different countries, it must be considered with cultural validity in mind, linking it with local instructional values and institutional realities instead of imposing external frameworks.

AI in EFL teacher PD, especially in Global South contexts like Iran, is, however, underexplored. The burgeoning discourse on AI in language education remains mainly situated in well-resourced, Western contexts. There is a significant paucity of research investigating its application for teacher development in the Global South, where cultural, infrastructural, and economic realities present unique challenges and contingencies (Ahmad et al., 2022; Mouta et al., 2025). Empirical research on AI-assisted coaching in EFL teacher CPD remains restricted, specifically in the Iranian context. While studies have investigated AI applications in language learning, e.g., automated writing evaluation or intelligent tutoring systems (Alharbi, 2023; Son et al., 2025), few have assessed its significance in supporting teachers' instructional development. The findings of the study may inform policymakers to support investments in scalable, technology-oriented CPD infrastructures, while teacher educators can incorporate AI literacy into pre-service and in-service training programs. EdTech developers may incorporate perceptions into planning more culturally approachable AI tools, and practitioners can better recognize how to leverage technology to facilitate—not replace—their professional expertise (Nazaretsky et al., 2022). Ultimately, this study results in broader discussions on the future of teacher development in a

progressively digital world, highlighting the need for ethical, impartial, and instructionally appropriate AI incorporation in education. Hence, this study asks:

RQ. *How does AI-assisted coaching influence lifelong learning, continuous professional development, and adaptive teaching practices among Iranian in-service EFL teachers?*

2. Literature Review

2.1. Theoretical Framework: Sociocultural Theory

This study is framed by sociocultural theory (SCT) (Vygotsky, 1978), which posits that learning is a socially mediated process where development occurs through interaction with more knowledgeable others and cultural tools. From this perspective, teacher professional development is a collaborative, context-bound activity. Considering AI as a potential cultural tool for scaffolding supports Vygotsky's zone of proximal development (ZPD), where tailored support can help teachers bridge present and potential abilities. This theoretical lens informs the analysis of both the persistent challenges in CPD for in-service EFL teachers and the appraisal of AI-assisted coaching as a potential mediator of learning.

SCT offers a fundamental framework for understanding how AI-assisted coaching works within the Iranian EFL context. It allows us to conceptualize AI system not as a replacement for human interaction, but as an advanced cultural artefact that mediates teachers' reflective practice and pedagogical decision-making (Case et al., 2025). An AI tool, by offering data-driven feedback and prompting reflection, functions as a scaffold within the teachers' ZPD (Moslemi Nezhad Arani, 2025), providing support that is gradually internalized as fostered adaptive expertise. SCT's emphasis on socially mediated learning underlines the significance of the community of practice even within an AI-mediated intervention (Guan et al., 2025). The study explores whether AI serves as a solitary tool or, in line with SCT, catalyzes collaborative reflection among teachers (as seen in peer discussions of AI feedback), thereby embedding the technological tool within a social learning process. This theoretical lens draws attention to potential sociocultural tensions, including when AI (as a tool often borrowed from Western pedagogical datasets) interacts with the localized, collective values and curricular realities of Iranian public schools. Therefore, SCT is applied as an analytic tool to explore if and how AI-assisted coaching achieves authentic, socially situated teacher development rather than imposing a decontextualized, technical solution.

2.2. The Persistent Challenges of CPD for In-Service EFL Teachers

CPD has become a crucial requirement in the rapidly shifting educational settings, mainly for Iranian in-service EFL teachers who need to explore developing instructional demands, technological developments, and various learner needs while encountering exceptional contextual issues (Mohammadi & Moradi, 2017). The theoretical bases of CPD are embedded in the sociocultural learning theory and adult learning principles (Knowles, 1980), focusing on the development of teachers as a lifelong learning process, a socially mediated process that includes reflection, collaboration, and adaptive skill-building (Borko, 2004; Opfer & Pedder, 2011).

Despite old top-down training workshops, present theories and practices of CPD underscore continuous, cyclical PD rooted in everyday practice, supporting transformative learning theory (Mezirow, 2000), which underscores the prominence of critical reflection and collaboration and paradigm shifts in professional identity improvement. Operationally, CPD incorporates a comprehensive array of formal programs (like certification courses and conferences), informal learning opportunities (such as collaboration and reflection, peer mentoring or coaching, and communities of practice), and self-directed inquiry (including reflective practice, action research, and digital microlearning), all planned to develop adaptive learning and expertise (Curran et al., 2019) that empowers teachers to respond successfully to changing classroom difficulties.

A critical appraisal from an applied linguistics perspective shows significant challenges in deploying AI-assisted coaching within Iran's EFL ecosystem. Firstly, linguistic and instructional limitations arise. Most advanced AI coaching tools are trained on Western educational datasets and English-language interactions, potentially misaligned with the particular syntactic, pragmatic, and cultural nuances of Persian-speaking learners and localized teaching practices (Tajeddin & Asadnia, 2023). These risks include offering feedback that is linguistically irrelevant or instructionally incongruent. Secondly, from a sociocultural standpoint, the very notion of a *more knowledgeable other* is complicated when that *other* is an AI (Alizadeh et al., 2024). AI lacks authentic human empathy, mutual cultural understanding, and dynamic intersubjectivity important for mediating teacher development within a particular community of practice. The tool risks being perceived as a foreign imposition rather than an incorporated cultural artefact. Lastly, ethical concerns occur. The application of AI requires a large-scale collection of classroom interaction data, nurturing serious questions about privacy, data sovereignty, and the potential for algorithmic bias that can support existing instructional inequalities rather than ameliorate them (Yadav & Shrawankar, 2025).

Empirical research highlights that effective CPD is reflective, sustained, and collaborative—factors presented to improve teacher self-efficacy and student outcomes (Darling-Hammond et al., 2017)—while more generic, one-size-fits-all models needing contextual relevance tend to have restricted impact (Kennedy, 2016). In the particular context of Iranian in-service EFL teachers, research has shown

systemic barriers to active CPD application, containing inadequate official support, inflexible curricular restrictions, and cultural resistance to instructional innovation (e. g., Karimi & Norouzi, 2021). These persistent challenges generate a significant gap between the need for continuous, adaptive development and the available, often ineffective structures.

Synthesizing the literature, the main challenges to effective CPD for Iranian in-service EFL teachers tend to be multi-layered. Teachers face insufficient institutional support, rigid top-down curricula, and limited access to relevant resources (Karimi & Norouzi, 2021). Professionally, traditional one-size-fits-all workshop models lack sustainability, contextual relevance, and opportunities for collaborative reflection, limiting transformative influence on practice (Kennedy, 2016; Mezirow, 2000). Culturally, there can be resistance to instructional innovation and a preference for established methods, which limits the adoption of new practices (Tajeddin & Asadnia, 2023). Technologically, barriers include inconsistent infrastructure, lack of training, and sociocultural hesitance towards integrating digital tools into pedagogy (Moslemi Nezhad Arani et al., 2024). These interconnected challenges underscore the need for CPD models that are not only adaptive and sustainable but also context-sensitive and supportive of teacher agency.

2.3. AI-Assisted Coaching: A Critical Appraisal as a Potential Solution

The challenges outlined above underline the potential of AI-assisted coaching as a creative solution that can offer personalized, practical professional learning experiences (Hwang et al., 2020). AI-assisted coaching leverages machine learning, NLP, and data-driven analytics to provide personalized, customized, and continuous support for teachers, enabling them to develop their teaching strategies in real-time (Yadav & Shrawankar, 2025). Theoretically, this approach is supported by SCT (Vygotsky, 1978), which underscores scaffolded learning via expert guidance and self-determination theory (Ryan & Deci, 2000), which emphasizes the role of autonomy, competence, and relatedness as critical features for teachers' CPD and motivation. From an operational standpoint, it incorporates intelligent tutoring systems, AI-driven feedback mechanisms, and predictive analytics tools that evaluate teacher performance, propose purposeful CPD resources, and analyze classroom interactions to improve adaptive teaching practices—conceptualized as the active adaptation of instructional strategies according to learner needs, contextual factors, and immediate data (Kim, 2023; Parsons et al., 2019).

Empirical research on AI-assisted coaching in teacher PD has generated mixed but promising findings. For example, Luckin et al. (2022) conducted a large-scale study, finding that teachers who were involved in AI coaching platforms showed greater development in adaptive teaching strategies. Luckin et al. (2022) concluded that AI had the capacity to offer instantaneous, personalized feedback and scenario-based simulations that could strengthen reflective practice. AI-assisted coaching can foster CPD

engagement through tools like chatbots that nurture teachers' motivation by offering personalized content (Zou et al., 2025), encourage adaptive practices by using analytics to recognize instructional weaknesses and suggest differentiated strategies (Tariq, 2025), and align with lifelong learning through data-driven development (Alias & Razak, 2025). However, Zhou et al. (2023) noted that unnecessary reliance on AI-generated recommendations could weaken teacher agency, producing a passive dependence on automated recommendations instead of nurturing critical teaching and decision-making. These results emphasize the need for a balanced, human-in-the-loop approach, where AI functions as a supportive tool instead of a replacement for teacher expertise.

Within the Iranian EFL context, research on AI-assisted PD is still restricted; however, existing literature offers both opportunities and challenges. For example, Tajeddin and Asadnia (2023) investigated Iranian in-service EFL teachers' attitudes toward technology-mediated PD and recognized cultural and official barriers, expressing skepticism toward AI-driven training and a preference for face-to-face mentorship. In addition, Alizadeh et al. (2024) highlighted that collectivist cultural norms in Iran might require localized AI coaching models that were in line with teachers' collaborative learning preferences instead of only personalized approaches. Recent developments in AI for education emphasize the prominence of ethical and culturally responsive design. For instance, recent studies (e.g., Feldman-Maggor et al., 2025) have explored the role of explainable AI in teacher CPD, confirming that algorithmic recommendations are apparent and interpretable.

Furthermore, previous studies have shown that over-dependence on AI could hinder human mentorship and collaboration, because AI lacks the detailed socio-emotional support needed for CPD, and that cultural and institutional factors in Iran—including access to technology and teacher autonomy—may moderate AI's efficiency as a scaffolding tool (Samala et al., 2025). In summary, while AI-assisted coaching presents a promising avenue for addressing the chronic shortcomings of traditional CPD by providing personalized, data-driven scaffolding, its application within the Iranian EFL context is underexplored and fraught with unique infrastructural, cultural, and ethical considerations. This gap necessitates the present inquiry.

3. Methodology

3.1. Research Design

This study uses interpretative phenomenological analysis (IPA) as its qualitative research methodology to investigate Iranian in-service EFL teachers' lived experiences with AI-assisted coaching for lifelong learning and adaptive teaching practices. IPA is an idiographic, inductive approach that

strives to recognize how individuals understand their personal and professional experiences within particular contexts (Smith et al., 2009). Embedded in phenomenology (Husserl, 2001) and hermeneutics (Heidegger, 1962), IPA highlights double hermeneutics—where a researcher understands the participants' explanations of their own experiences (Smith & Osborn, 2015). The design is particularly appropriate for this study because it supports the research objectives of finding subjective meanings, emotional responses, and contextual challenges encountered by Iranian in-service EFL teachers as they are involved with AI-assisted PD. IPA allows for an interpretative engagement with data, empowering researchers to probe not only what teachers experience but also how sociocultural, infrastructural, and ethical factors influence those experiences (Larkin et al., 2019). Assuming AI coaching is a developing phenomenon in Iran's educational landscape, IPA can concentrate on deep, case-oriented investigation (instead of generalization), guaranteeing a detailed understanding of teachers' adaptive processes.

The rationale behind choosing IPA in the present study rests on three vital concerns. Firstly, the emphasis on lived experiences confirms that the study captures firsthand understanding, containing resistance, motivation, and transformational learning moments as teachers cooperate with AI coaching tools (Pietkiewicz & Smith, 2014). Secondly, the contextual sensitivity of IPA accommodates Iran's unique sociocultural and institutional dynamics, focusing on Islamic and humanistic values and the rich culture and history of the country, which may considerably impact how AI and technology can be assumed and perceived (van Manen, 1990). Thirdly, IPA's theoretical flexibility enables the incorporation of sociocultural theory (Vygotsky, 1978) to inspect how AI tools work as mediators within teachers' zones of proximal development, thereby aligning with their PD. By integrating IPA, this study highlights depth over breadth, showing how teachers interpret and adjust to AI coaching as a scaffold for lifelong learning—a viewpoint that quantitative surveys or experimental designs may not sufficiently address. This design stresses the meaning-making process, supporting the broader goal of exploring how AI can be ethically and efficiently localized for Iranian EFL contexts.

3.2. Participants and context

This study explored the lived experiences of Iranian in-service EFL teachers operating in public schools. The participants were chosen through a purposive, homogeneous sampling strategy, targeting a group with shared experiences of being in-service EFL teachers in Iran's public school system (Smith et al., 2009). Although IPA usually prioritizes depth over breadth with smaller samples (N = 3-15), the sample size was purposefully extended to 17 teachers. This sample size, as an anonymous reviewer also asserted, exceeds the sample size typical of IPA, but it was necessary to confirm representation across well-equipped urban and resource-constrained rural school settings. Another major reason why the

researchers used this large number of participants was to capture diverse infrastructural contexts within a single city.

Participants included 17 teachers with teaching experience fluctuating from 6 to 25 years (M = 14, SD = 6.42), signifying various age groups between 28 and 47 years of age (M = 35, SD = 5.63). The sample involved 7 female and 10 male teachers. It should be recognized that while female teachers dominate the Iranian public EFL teaching profession, our study involved a higher number of male teachers; we acknowledge that this is one limitation of the present study, but it allowed for the inclusion of a wider range of school contexts and proficiency levels, which was central to the research aim. All of them received a Master's degree in English language teaching. All the participants were informed by receiving comprehensive information about the research goals and procedures, with strict confidentiality measures implemented to protect their identities through pseudonymization of all data. The selected teachers were from schools with different technological infrastructure levels, from well-equipped urban institutions to resource-constrained rural contexts in Tehran, Iran. This strategic sampling supports how AI-assisted coaching works through diverse educational contexts within Iran's centralized public school system. Specific attention was paid to employing teachers with different levels of technological understanding, from novice users to those with advanced digital skills, to include a broad range of perspectives on technology-mediated CPD. Table 1 summarizes information related to the participants.

By concentrating on these teachers' professional experiences, the study probed how AI coaching tools interacted with the multifarious realities of Iranian public education, containing large class sizes, restricted connection to real language materials, and the tension between out-of-date grammar-focused teaching and modern communicative approaches directed by current curricular reforms. The demographic diversity of participants allowed for the analysis of how factors including instructional experience, school location, and technological access impacted their engagement with and perception of AI-assisted CPD.

Table 1

Demographics Information of the Participants (N = 17)

Characteristic	Description
Gender	7 Females, 10 Males
Age	Range: 28-47 years (M = 35, SD = 5.63)
Teaching Experience	Range: 6-25 years (M = 14, SD = 6.42)
Highest Qualification	Master's degree in English Language Teaching (all)

Characteristic	Description
School Location	Mix of well-equipped urban and resource-constrained rural schools in Tehran
Technological Proficiency	Range from novice users to those with advanced digital skills

3.3 Data Collection Procedure

To conduct the present study on AI-assisted lifelong learning, the researchers implemented a two-week blended workshop series. The second researcher of the study invited the participants to take part in the workshops. This intervention started with a pre-workshop orientation (Day 1) intended to introduce teachers to AI's role in CPD and address early uncertainty. This session involved a demonstration of the potential of AI in fostering EFL teaching (producing adaptive feedback and NLP tools), practical presentations of designated AI tools (including TeachFX for classroom interaction analysis and ChatGPT for reflective journaling prompts), group discussions about ethical issues (data privacy and bias), and contextual restrictions (i.e., internet access challenges in rural schools).

To directly address the significant ethical concerns related to the use of Western-developed AI tools in the Iranian context, predominantly those concerned with data sovereignty, privacy, and algorithmic bias, the researchers designed and implemented a stringent, multi-layered data privacy protocol. All AI tools (TeachFX, ChatGPT, and Edthena) were configured and applied in their most privacy-conscious modes. Explicit data handling protocols were established earlier to the intervention as follows: (1) All potentially identifiable student data (names, voices in recordings) were anonymized, or pseudonymized, before any analysis; (2) where tool functionality allowed, cloud storage and data logging features were disabled to guarantee all data processing occurred locally, or was instantly deleted; and (3) significantly, no classroom audio/video recordings or sensitive teacher reflection data were uploaded to the external servers of the AI service providers without the explicit, prior, and written consent of both the teacher and relevant school authorities. Participants were fully informed of the specific types of data they would produce (e.g., written reflections) and were given the option to enable or disable particular features. This localized, consent-based approach was necessary to explore ethical uncertainties, build trust, and mitigate risks linked with cross-border data flows to Western AI platforms.

The skill-building sessions (Days 2-4) concentrated on training teachers to implement AI tools for immediate classroom adaptation. Throughout these sessions, teachers were involved in simulated teaching scenarios where they learned to respond to AI-generated feedback, namely, modifying the pace of instruction according to student engagement analytics. The teachers also contributed to collaborative design activities, working collectively to generate lesson plans that incorporated AI recommendations

while wisely understanding cultural significance, mainly, the balance between communicative methods and Iran's grammar-focused curriculum.

The application stage (Weeks 1-2) transferred learning into authentic classroom contexts. The teachers vigorously incorporated AI platforms such as Edthena for video-based coaching to monitor, record, and evaluate 2-3 of their lessons. They received instant feedback via the Edthena platform with personalized resources, including micro-lessons on scaffolding techniques. Weekly online peer circle meetings provided opportunities for teachers to exchange difficulties and achievements, cultivating collaborative learning during this process.

The 2-week workshop was planned as a guided intervention. While AI tools (TeachFX, ChatGPT, and Edthena) were presented, and their application was encouraged for consistency, teachers began to retain full autonomy in how and when to apply them during the application stage. AI usage during the application phase was not prescribed. The teachers were encouraged to apply AI for reflective journaling and lesson analysis, but they could choose not to implement a particular tool or felt free to opt out of any data-sharing feature at any time. This approach was essential for observing authentic, agentive engagement with AI-assisted coaching rather than prescribed compliance. Explicit data privacy protocols were established: All AI tools were used in their most privacy-conscious configurations (e.g., using anonymized student data and disabling cloud storage where possible), and no classroom recordings or sensitive teacher data were uploaded to external servers without explicit, written consent.

3.4. Instruments

The main data collection instruments for this study were semi-structured interviews, designated for their capacity to obtain detailed, in-depth interpretations of participants' lived experiences while allowing for adaptability to investigate developing themes (Smith et al., 2009). The interview protocol comprised open-ended questions planned to explore teachers' perceptions and experiences with AI-assisted coaching, its influence on their enduring learning and adaptive teaching practices, and the sociocultural, infrastructural, and ethical challenges prompting the usefulness of AI tools in their context. In addition to the interviews, the participants kept reflective journals over a 4-week period, recording their interactions with AI coaching tools and any challenges they encountered. Moreover, classroom observation notes (for a subset of five participants) were implemented to triangulate self-reported data with genuine teaching practices affected by AI feedback. The second researcher conducted the interviews, gathered the reflective journals, and observed the classes.

Before selecting participants, informed consent was received, underscoring voluntary participation, anonymity (pseudonyms were implemented), and the right to withdraw. Ethical approval was confirmed by the university. A pilot interview with two in-service EFL teachers (omitted from the

main study) was implemented to enhance question transparency and flow. The major data collection tool included online interviews (by means of Zoom and Skype), each lasting for 45–60 minutes. Interviews were audio-recorded and transcribed verbatim. Participants also gained weekly reflective prompts (e.g., *Explain when AI feedback changed your instructional decision*) and submitted entries by means of secure platforms (e.g., Google Forms). For five teachers, 2–3 classroom sessions were observed after AI coaching to highlight behavioral modifications, including modifications to student needs. All transcripts, journal entries, and observation notes were anonymized and stored on a secure, encrypted server with access limited to the research team to guarantee confidentiality. This approach, consistent with the protocols applied during the use of the AI tool itself, was implemented to guarantee confidentiality throughout the research process.

The choice of semi-structured interviews supports IPA's emphasis on depth and meaning-making (Smith & Osborn, 2015), while reflective journals capture longitudinal engagement with AI tools, securing IPA's idiographic commitment (Pietkiewicz & Smith, 2014). The triangulation of data by having interviews, journals, and observations could enhance validity by cross-verifying data sources (Larkin et al., 2019). Problems like the digital divide were alleviated by offering rural teachers basic tools (such as mobile-based apps), and social desirability bias was minimized through rapport-building and open-ended questioning. This multi-method approach confirmed a detailed awareness and knowledge of how Iranian in-service EFL teachers experience AI-assisted coaching within their distinctive professional and sociocultural contexts.

3.5 Data Analysis

The data analysis followed a systematic, iterative procedure influenced by the phases of thematic analysis (Braun & Clarke, 2006) but was basically directed by the idiographic and interpretative principles of IPA (Smith et al., 2009). This hybrid approach allowed for a structured coding process while preserving the necessary in-depth, case-by-case focus. The analysis started with a detailed, case-by-case examination of each participant's data to produce individual experiential accounts before searching for patterns across cases, thereby maintaining IPA's commitment to idiographic depth before extending to cross-case thematic incorporation.

The analysis process started with transcription and immersion, where all semi-structured interviews (45–60 minutes each) were transcribed verbatim, preserving linguistic nuances, pauses, and emotional tones (e.g., hesitation when discussing AI's ethical implications). Reflective journal entries and classroom observation notes were compiled into a single dataset. The second researcher reread the transcripts and notes several times to acquaint himself with the depth of the data, recording original observations and potential patterns.

Next, coding was implemented inductively, permitting themes to develop organically without being forced by pre-existing categories. Early open coding included summarizing explicit content, tracked by focused coding to recognize frequent and significant concepts. Codes were then organized into potential themes, capturing both semantic (surface-level) and latent (underlying) meanings. Patterns were investigated across cases, only after this detailed individual analysis had been completed. Drawing on SCT, the analysis explored how AI tools mediated teachers' professional growth, particularly within their zones of proximal development.

Triangulation was employed to ensure trustworthiness by cross-referencing interview data with journal entries and classroom observations. Member checking involved sharing preliminary findings with five participants to validate interpretations (Creswell & Poth, 2016). Additionally, reflexivity was maintained through a research journal to critically reflect on and bracket preconceptions about AI's role in education (Nowell et al., 2017). The final phase involved refining and defining themes, ensuring the themes accurately represented the dataset while offering meaningful insights into teachers' engagement with AI-assisted coaching.

4. Results

This section presents the findings related to the research question posed in the Introduction section: How does AI-assisted coaching influence lifelong learning, PD, and adaptive teaching practices among Iranian in-service EFL teachers? Thematic analysis followed Braun and Clarke's (2006) six-phase approach, with codes produced inductively from the data. This included familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the report. Codes were produced inductively from the data. Drawing on data from semi-structured interviews (SI), reflective journals (RJ), and classroom observations (CO), four key themes emerged, as shown in Table 2, which provides a summary of the emergent themes and their constituent codes. In what follows in this section, we present the results followed by relevant extracts from the participants.

Table 2

Summary of Themes and Codes on AI-Assisted Coaching's Influence

Theme	Key Codes
AI as a Catalyst for Personalized and Reflective Teacher Learning	Customized learning opportunities; Constructive & immediate feedback; Recognition of strengths/weaknesses; Self-directed & self-paced learning; Access to modern methodologies; Reflective questioning; Development of metacognitive skills.
Enabling Data-Driven Adaptive Teaching Practices	Data-driven lesson adjustments; Identification of student needs; Shift to learning facilitator; Differentiation & personalization; Just-in-time micro-feedback; Enhanced classroom management; Automated grading & formative assessment; Improved assessment literacy.
Emotional, Cognitive, and Collaborative Support	Reduced administrative burden; Lowered cognitive & emotional stress; Development of problem-solving & critical thinking; Enhanced professional agency; AI as a simulated collaborative partner; Support for peer coaching networks.
Navigating Sociocultural and Ethical Landscapes	Development of AI competency & digital literacy; Understanding ethical implications & biases; Critical vigilance against over-reliance; Cost-effective & scalable CPD delivery; Accessible self-paced training; Sustainable model for resource-constrained settings.

Theme 1: AI as a Catalyst for Personalized and Reflective Teacher Learning

Teachers stated that AI tools fostered their personalized CPD by providing customized learning opportunities and materials, recognizing their strengths and weaknesses, and offering constructive and immediate feedback on their lesson plans, teaching practices, classroom management, discourse, and language use, teaching methods and quality, student engagement, and achievement. Teacher 3, for example, remarked that: "After several weeks of using the tool, ChatGPT helped me identify students' needs, make creative and effective materials, and modify my instructional practices. (RJ)" This feedback, obtained after weeks of using the tool, allowed for ongoing improvement of their personal instructional skills. AI tools scaffolded complex strategies by breaking them into manageable steps, such as how to implement task-based learning and teaching, leading to adaptive teaching and learning practices. This could break down and manage the complexity, quality, and burden of developing professionally and continuously for in-service EFL teachers. Teacher 4 highlighted the "role of AI in showing modern and creative teaching methodologies, like flipped classrooms, blended learning, and communicative language teaching, (SI)" which were not broadly used in their local settings.

Continuous and Convenient Learning

AI coaching allowed for self-directed, self-paced, and lifelong learning by recommending and providing tailored resources and personalized feedback, such as webinars, demonstration videos, podcasts, and linking with teachers' goals, needs, weaknesses, and interests. For example, following the AI-integration workshop, Teacher 13 noted that "AI recommended me to attend particular webinars and provided needed feedback to change my teaching practices with new strategies and techniques" (SI). Tools, including ChatGPT summarized research into practical takeaways, provided helpful feedback on their weaknesses, showed state-of-the-art teaching methods and techniques, identified areas for success and growth, and saved time while keeping teachers informed. During an observation, Teacher 5 used AI for autonomous PD and stated that "We could learn at our convenience at home or any place we wanted, and we used AI to develop autonomously anytime and anywhere without any limitations, which could lead to enhancing our professional development creatively" (CO).

Reflective Practice and Metacognition

AI enhanced more profound self-assessment practices by means of providing reflective and leading questions, offering a framework, or guiding questions, identifying areas for development, analyzing teaching performance, and using personalized feedback and recommendations. As Teacher 4 noted, "*AI tools informed us to pay attention to parts of my teaching, notice patterns, and enhance reflection*" (SI). Teachers developed metacognitive skills by monitoring and tracking development and obtaining AI-generated study plans. AI helped teachers to see the areas that were unnoticed and provided more constructive and constant information when they planned, acted, and observed their actions. Moreover, AI provided more support for them to think and reflect on their actions by asking different questions, directing them through hints and prompts, and devising new instructional plans and strategies. In a post-observation reflection, Teacher 8 commented that "*AI helped us regulate and control our instructional practices, attitudes, and beliefs, along with directing their emotional, social, and professional practices. This could lead to more reflective and social development by means of AI tools"* (CO).

Theme 2: Enabling Data-Driven Adaptive Teaching Practices

Distinct from the personalized learning experienced by teachers themselves, this second theme addresses how AI-generated information helped the teachers to change their instructional techniques and adjust them to the needs of their students.

Data-Driven Instruction

AI could obtain needed information from the teachers, make sense of the received data, explore new and novel alternatives, and offer instantaneous and effective adjustments to teachers' lessons based on student performance, such as preparing vocabulary reviews or games and activities for diverse learners, as stated by Teacher 15: "*AI helped me to see the needs of my students during grammar teaching. So, I learned how to implement scaffolded tasks for beginners to enhance their knowledge of grammar*" (RJ). Hence, classroom analytics helped teachers identify effective instructional methods.

Dynamic and Student-Centered Classrooms

AI-assisted coaching shifted the teachers' roles from content deliverers to learning facilitators, fostering students' autonomy by means of adaptive learning opportunities. AI could analyze classroom interactions, provide just-in-time micro-feedback, set targeted goals based on observed behavior, foster students' engagement and participation level, and support differentiation and personalization based on students' preferences, learning gaps, and objectives. In this regard, Teacher 9 stated that "*AI could help us make our lessons more productive and meaningful by focusing on learners' needs, lacks, and wants. Also, AI could make our reflections more situated by asking several questions from our class, students, and teaching scenarios"* (CO). Tools also enhanced classroom management by suggesting strategies for disruptive behaviors, as mentioned by Teacher 11: "*AI helped me use techniques to manage time and class*" (SI).

Personalized Assessment and Feedback

AI restructured automated grading, formative assessments, and adaptive testing, modifying the difficulty of the items according to student performance. Teachers realized improvements in feedback quality and efficiency, as stated by Teacher 7: "*Following the AI workshop, I learned to foster students' reading and writing by using different strategies with ChatGPT's help*" (RJ). AI could provide new assessment tasks that could be suitable for specific learners. Also, it saved teachers' time and energy to design assessment tasks, grade and interpret assessment data, and provide feedback on particular students. For example, Teacher 10 remarked that

I learned to see assessment differently, since AI highlighted the importance of continuous formative assessment to enhance students' achievement, motivation, engagement, and learning. So, AI provided different assessment tasks, activities, and practices for formative assessment purposes. Also, I learned to grade and interpret the assessment using applications and sites. (RJ)

This could facilitate the assessment practices of teachers and enhance their assessment literacy in consequence.

Theme 3: Emotional, Cognitive, and Collaborative Support

Reducing Burnout and Workload

AI reduced administrative burden, such as preparing teaching materials, lesson plans, and assessment tasks, recording their practices and materials, and encountering different executive challenges, as highlighted by Teacher 5: "*We referred to AI for help with critical incidents, lowering cognitive and emotional stress*" (RJ). AI could reduce mental load via feedback, generate lesson plans, offer activities, align them with learning standards, track goals, and monitor progress.

Cognitive Skill Development

Teachers credited AI with developing problem-solving, critical thinking, and decision-making. More specifically, AI could help teachers adjust to novel situations, prompt them to analyze their own thinking, nurture data-informed decision-making, and suggest higher-order thinking tasks. Teacher 2 underscored this role, stating that "*When the AI proposed I use more open-ended questions, it pushed me to reflect on my own questioning habits and to plan for profounder student thinking*" (RJ).

Additionally, AI helped recognize cognitive gaps in student tasks, provide alternatives based on goals or student profiles, enhance pattern recognition, develop creative problem-solving, and build strategic goal-setting and monitoring. Teacher 12, for example, remarked that "*AI helped me think differently while I encountered new situations or challenges. In this way, I could learn to tackle the problems more wisely by thinking of diverse alternatives, thinking more critically, and solving problems creatively*" (SI).

Collaborative Growth

AI enhanced peer coaching and collaborative research by identifying trending English Language Teaching (ELT) topics, preparing literature reviews, and facilitating group discussions. This is clearly seen in Teacher 16's utterance: "*AI directed our collaborative projects, improving teaching quality*" (RJ). Also, AI could act as a simulated peer, mimicking collaborative learning by offering immediate, non-judgmental feedback similar to a supportive colleague. AI facilitated peer-to-peer coaching, suggested collaborative lesson planning or co-reflection opportunities, created a shared language for growth, offered team-based PD paths, and shaped shared learning networks. Following the workshop, numerous teachers started to conceptualize AI not just as a tool, but as a consistent source of support. Teacher 14, for instance, described it as a simulated collaborative partner as follows:

AI was like a real peer to me. I learned from AI-based collaboration as it provided constructive support and feedback when supervisors and educators were not approachable. It also informed me how

to teach during my lesson and I used it during and after my teaching to reflect on my teaching experiences. (RJ)

Theme 4: Navigating Sociocultural and Ethical Landscapes

AI Literacy and Ethical Awareness

Teachers developed AI competency via prompts, interactions, challenges, and understanding ethical implications, as expressed by Teacher 10: "*I learned AI practices, ethics, and values"* (SI). Teachers gained experience in using AI, faced different challenges, looked for different options AI could offer and tried hard to make their AI practices more ethical. Beyond general competency, specific ethical concerns emerged from the data, including the risk of over-reliance and potential biases in AI-produced content. For example, Teacher 2 warned that "*We must be careful; AI might reinforce incorrect linguistic models or cultural biases if we don't double-check them*" (CO), underscoring a critical awareness of issues central to global AI ethics frameworks, such as transparency, accountability, and bias mitigation (UNESCO, 2021). Another teacher expressed concern about data privacy, questioning, "Wh*ere do the data and personal information I put into this tool go? Who uses them? Which countries are getting our information?*" (Teacher 6, SI), whereas others warned against overtrust, with Teacher 11 noting that, "We should not allow this mode of technology to replace our own professional judgment" (RJ).

Cost-Effective Scalability

One of the most significant findings of this study was the cost-effective scalability of AI-assisted CPD for Iranian EFL teachers. The implementation of AI-enabled platforms allowed for large-scale, affordable delivery of CPD by means of self-paced training modules, interactive simulations, and automated feedback mechanisms. These tools considerably decreased the need for costly, face-to-face workshops and external trainers, making professional development more accessible across geographical and socio-economic boundaries. As Teacher 9 observed: "*Teachers could be involved with the material at their convenience, which amplified participation rates and sustained engagement over time"* (CO). Significantly, the scalability of these AI tools did not compromise quality. On the contrary, AI personalized the learning experience by adapting content to each teacher's progress and needs, making the process both efficient and impactful. This scalable model provides a sustainable solution to CPD in resource-constrained settings like Iran, where traditional training models are often financially and logistically excessive.

In conclusion, the findings show that AI-assisted coaching intensely influenced Iranian EFL teachers' CPD, adaptive teaching practices, and lifelong learning. Key roles include: (1) AI's role in personalizing CPD through immediate feedback, resource recommendations, and

reflective practice; (2) its facilitation of data-driven, student-centered teaching via dynamic lesson modifications and automated assessments; (3) its emotional and cognitive support in reducing burnout and nurturing problem-solving, including its role as a simulated collaborative partner; and (4) its socio-cultural influence through AI literacy, a critically aware stance on ethical implications and scalable training. Teachers underscored AI's transformative potential in developing adaptive, collaborative, and resilient teachers while also highlighting ethical and practical challenges that must be addressed for wider application.

5. Discussion

This study explored how AI-assisted coaching affects lifelong learning, PD, and adaptive teaching practices among Iranian in-service EFL teachers, filling a main gap in the literature on AI's role and significance in teacher CPD within under-resourced and socioculturally complex educational contexts. The findings demonstrate that AI tools function as a transformative force in scaffolding teachers' PD, developing adaptive expertise, and alleviating systemic challenges including curricular rigidity, restricted access to training, and heavy workload. However, the consequences underscore tensions between AI's potential and the realities of Iran's educational infrastructure, ethical matters, and cultural resistance to technological reliance. These outcomes contradict previous research on AI in teacher development, providing detailed ideas into the localization of global EdTech innovations.

A significant contribution of this study is its depiction of AI's role in personalizing CPD, a finding in line with Desimone's (2009) model of effective PD, which stresses continuous, content-focused, and active learning. The teachers explained that AI-assisted coaching offered tailored feedback, suggested contextually appropriate resources (e.g., micro-lessons on communicative methods), and encouraged reflective practice—features often unclear in Iran's top-down, workshop-based CPD system. This aligns with Hwang et al.'s (2020) argument that AI-driven coaching can go beyond one-size-fits-all PD by adjusting to individual teachers' zones of proximal development. Although studies in Western contexts (Moro-Visconti, 2024) underline AI's scalability and capacity, Iranian teachers encountered unique barriers, including unreliable internet access in rural areas and cynicism toward automated feedback, highlighting the digital divide's moderating role (Ahmad et al., 2022).

The study also developed the awareness of the influence of AI on adaptive teaching, a competency critical for solving different learner needs in Iran's mixed-ability classrooms. The teachers leveraged AI analytics to vigorously modify teaching (e.g., scaffolding grammar tasks for beginners), which confirms Du's (2025) findings on AI-enhanced responsiveness. However, unlike studies where AI chiefly improved teacher judgment (Nazaretsky et al., 2022), some Iranian teachers described over-

reliance on AI recommendations, risking the loss of instructional autonomy—a concern underscored by Zhou et al. (2023) in high-resource contexts. This paradox implies that although AI can democratize access to expert strategies, its incorporation must balance automation with professional agency, mainly, in contexts such as Iran, where teacher autonomy is already controlled by centralized curricula (Safari & Rashidi, 2015). Emotionally and cognitively, AI worked both as a support and a stressor. Participants respected the role of AI in decreasing burnout via administrative automation (e.g., quiz generation), supporting Dogan et al.'s (2025) research on AI's workload alleviation. On the other hand, the pressure to implement modern technological tools and interpret AI feedback worsened stress for less tech-savvy teachers, a problem less noticeable in studies from technologically advanced environments (Saleh & Alsubhi, 2025). This duality underlines the importance of holistic support systems that pair AI tools with mentorship.

From a sociocultural perspective, the findings reveal tensions between AI's global potentials and local realities. While the teachers developed greater AI literacy and ethical awareness—mirroring Nazaretsky et al.'s (2022) focus on "human-in-the-loop" design—their engagement was mediated by collectivist norms that favor peer collaboration over purely individualized AI coaching. This contrasts with some of the previous studies advocating for fully personalized AI CPD (e.g., Yadav & Shrawankar, 2025), underscoring the necessity for hybrid models that integrate AI with established communal learning practices. This need for culturally responsive integration, where technology supplements rather than displaces, is further illustrated by teachers' conceptualization of AI as a *simulated collaborative peer,* which positions AI as a scaffold within teachers' social learning networks rather than a replacement for human interaction, a nuanced finding that extends discussions on human-AI collaboration in PD (e.g., Luckin et al., 2022; Nazaretsky et al., 2022).

Furthermore, the development of critical AI literacy, including an awareness of ethical pitfalls such as algorithmic bias and data privacy concerns, emerged as a necessary correlate to technical skill. Teachers' caution against over-reliance on AI outputs underscores the importance of frameworks like UNESCO's (2021) recommendations, which emphasize human agency and accountability—principles that must be central to culturally responsive AI integration in teacher CPD. In Iran, where collaborative professional learning circles (e.g., *doreha-ye amoozeshi*) have long been a cornerstone of teacher development (Afshar & Doosti, 2022), AI tools should be designed to augment these collegial assemblies. For instance, AI could be used to identify shared challenges from classroom analytics or to curate collaborative reflection prompts, thereby seeding peer discussions rather than supplanting them. The study also indicates that teachers' trust in AI was often mediated through peer validation; recommendations were more readily adopted when scrutinized by colleagues, suggesting that AI's role in such contexts should be iterative and collaborative. These findings challenge the prevailing discourse of

AI-driven hyper-individualization in PD, favoring a "glocal" approach—where global technological innovations are deliberately aligned with local values, hierarchies, and modes of knowledge transfer.

6. Conclusion

This study investigated how AI-assisted coaching supports lifelong learning, CPD, and adaptive teaching practices among Iranian in-service EFL teachers, incorporating a sociocultural framework and qualitative methods to show that AI tools offer personalized feedback and reflective opportunities, filling gaps in Iran's traditional CPD system. The research underlined AI's transformative role in under-resourced educational contexts by fostering teacher development through custom-made support. Teachers stated improved adaptive teaching practices, leveraging AI for data-driven teaching, dynamic classroom modifications, and personalized assessments, though some faced challenges balancing AI recommendations with professional autonomy. Emotionally, AI lessened burnout by automating administrative tasks, but it also presented stress for less tech-savvy educators, emphasizing the need for supportive mentorship in conjunction with technological incorporation. From a sociocultural perspective, whereas AI-enhanced teachers' digital literacy and ethical awareness—as shown in concerns over data privacy and algorithmic bias—its effectiveness was moderated by infrastructural inequities (e.g., rural internet access) and collectivist preferences for collaborative—instead of purely personalized—learning.

In spite of its contributions, this study has limitations. The IPA design, while rich in depth, limits transferability, and the short-term intervention (two weeks) may not fully capture the longitudinal impacts of AI coaching. Furthermore, the study underrepresented rural teachers with serious technological challenges, suggesting delimitations in contextual applicability. Future research should explore long-term AI incorporation in CPD, the role of hybrid (human-AI) coaching models, and policy-level strategies to bridge Iran's digital divide.

The findings of this study may present implications for enhancing sustainable teacher education, mainly in under-resourced settings that share similarities with Iran. By illustrating how AI-assisted coaching can offer cost-effective, scalable, and personalized PD, this research provides a framework that highlights AI's potential to alleviate some systemic gaps in traditional teacher training models. AI technologies provide an ecologically friendly, digitally accessible substitute to traditional PD approaches that depend on resource-intensive workshops. This eradicates the demand for travel and physical materials while guaranteeing continuous, timely support. Future initiatives should arrange hybrid AI-human mentoring models that combine technological efficiency with collaborative and reflective pedagogy, thereby creating resilient, future-ready teacher education ecosystems. Although the findings are contextually bound to the Iranian EFL context, the recognized themes—including the need for

balanced human-AI collaboration, culturally responsive design, and support for teacher agency— offer contextually bound insights which may provide critical insights that can inform, not dictate, the development of equitable AI-assisted CPD programs in other settings.

Declaration

We confirm that this work is original and is not under consideration by any other journal.

Transparency Statements

The datasets analyzed during the current study are available from the corresponding author on reasonable request.

Acknowledgements

The authors would like to thank all those who contributed to the completion of this project.

Declaration of Interests

The authors declare that they have no conflict of interest.

Funding

No funding was received for this study.

Ethical Consideration

This manuscript adheres to the ethical guidelines provided by the Committee on Publication Ethics (COPE) for ensuring integrity and transparency in the research publication process.

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