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# Exploring Iraqi Kurdish EFL teachers' familiarity with AI-driven technology

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Artificial intelligence (AI) is increasingly influencing educational practices, offering innovative tools for language teaching and learning. However, the extent of teachers' familiarity, acceptance, and use of AI in EFL classrooms remains underexplored in the Iraqi Kurdish context. This study employed a descriptive quantitative design to examine these dimensions among 565 Iraqi Kurdish EFL teachers (215 male, 350 female) holding bachelor's, master's, or doctoral degrees. Data were collected via a 5-point Likert scale questionnaire distributed through a snowball sampling technique initiated from a purposive sample. Statistical analyses included one-way ANOVA to identify differences by academic qualification and age, and independent samples t-tests to assess gender-based variations. The findings revealed significant differences in AI engagement by gender, age, and academic qualification. Teachers aged 31–40 reported higher familiarity and usage than other groups, while PhD holders showed the highest familiarity and use, and master's degree holders the highest acceptance. Overall, teachers demonstrated moderate levels of familiarity, acceptance, and use of AI-driven technologies. Conceptually, these findings suggest that AI adoption in EFL teaching is not merely a matter of personal preference or demographic variation, but a context-sensitive process shaped by professional experience, academic preparation, and access to institutional and pedagogical support. The results underscore the need for targeted professional development, institutional support, and comprehensive AI integration strategies. These findings provide actionable insights for policymakers, curriculum designers, and teacher educators seeking to enhance AI adoption and improve EFL teaching and learning outcomes in the Iraqi Kurdish context.

**Keywords:** Artificial intelligence, engagement with AI tools, familiarity with AI tools, Kurdish EFL teachers

# 1. Introduction

Artificial intelligence (AI) has become increasingly a primary factor in changing various fields, comprising business, healthcare, and most importantly education (Ahmad et al., 2021). AI, in the context of education, provides modern solutions to consistent obstacles, offering customized learning and teaching practices. AI learning platforms, intelligent grading systems, and automated tutoring systems are widely available to learners and teachers (Zhang et al., 2023). These technologies could be a great help to improve the effectiveness of teaching, adopt word balance, and promote student-centeredness in the educational institutions. Therefore, the incorporation of these AI tools into classroom environments heavily relies on teachers' preparedness and enthusiasm to adapt these technological advancements (Qasim, 2024).

Educators are the backbone of every pedagogical system; their viewpoints are important for succeeding the familiarity and acceptance of the AI tools (Kim et al., 2022). Teachers' engagement with AI tools – defined as the incorporation of digital technologies into classroom practices – directly impacts on teachers' capability to employ such tools (Alwaqdani, 2024). Teachers' familiarity can be considered as having awareness and practical knowledge on AI tools to implement them in classroom. Furthermore, the acceptance of AI tools comprises the teachers' attitudes and preparedness for the adoption of AI such as user-friendliness, convenience, and comprehensive viewpoints towards the technological breakthroughs (Falebita & Kok, 2024; Nuangchalerm et al., 2024).

To strengthen the conceptual foundation of this study, Connectivism provides a guiding lens for understanding teachers' engagement with AI tools. Connectivism frames learning as the formation and navigation of digital networks; therefore, teachers' familiarity with AI tools reflects their initial ability to connect to technological knowledge sources, while their acceptance of these tools demonstrates their willingness to integrate digital nodes into their professional learning networks. Similarly, their use of AI tools represents active participation within these networks, translating digital connections into meaningful practice. By situating the study within this theoretical perspective, the choice of variables becomes theoretically informed rather than descriptive, and demographic differences – such as gender, age, and academic qualification – are understood as factors that influence individuals' opportunities and readiness to form and sustain digital learning connections. Accordingly, Connectivism not only justifies the study's focus but also provides a framework for interpreting how teachers engage with AI in contemporary EFL contexts.

Notwithstanding the increasing presence of AI tools, several educators remain uncertain about accepting these technological resources as a result of circumstances, such as insufficient training, restricted exposure, and uncertainties about possible obstacles such as job replacement (Dilmaghani et al., 2019), data confidentiality, (Plikas et al., 2024), and ethical concerns (Reddy Yellu et al., 2021). While these concerns have been discussed in international scholarship, their relevance may vary across educational settings depending on local infrastructure, institutional support, and teachers' professional preparation. In under-researched contexts such as Iraqi Kurdistan, where the integration of

emerging educational technologies is still developing, it is important to examine how teachers perceive and engage with AI in their actual teaching environment. The incorporation of AI tools in educational institutions is persistent to the needs of examining the current state-of-art in the Kurdish EFL context. Due to this fact, the current research is intended to explore the perceptions of the Kurdish EFL teachers who are qualified to employ AI technologies in their classroom environment. Additionally, the research intends to explore the level of familiarity, acceptance, and uses of AI tools in educational settings, focusing on primary factors impacting on acceptance, such as willingness, usability, and attitudes to adopt AI technology.

Although AI-platforms are becoming increasingly prevalent in education, limited research has focused on teachers' familiarity with and acceptance of these technologies, particularly regarding the factors influencing their attitudes. This study addresses this gap by investigating key determinants of AI acceptance among teachers and their implications for effective integration into teaching practices. Throughout this investigation, the present research seeks to offer valuable contributions to teachers, educators, and policymakers to tailor curriculum to meet the students and teachers' needs of using AI tools.

The researcher attempts to answer the following research questions to achieve the objectives of the study:

RQ1. How do gender-related differences in perceived usefulness and ease of use influence AI adoption among EFL teachers?

RQ2. How do demographic variables (age, qualification) influence teachers' position within AI-supported knowledge networks in EFL education?

RQ3. How do Kurdish EFL teachers perceive the role of AI technologies in fostering networked, self-directed learning environments?

RQ4. What are the factors influencing Kurdish EFL teachers' engagement with AI tools in the context of digital knowledge construction?

## 2. Literature review

### 2.1 *The role of teachers in AI integration*

The integration of Artificial Intelligence (AI) in education has been a growing area of research, with much of the existing literature focusing on student perceptions and learning outcomes. AI in education refers to the use of intelligent systems capable of automating tasks, personalizing instruction, and enhancing teaching efficiency (Stuchlikova & Weis, 2024). AI applications include machine learning, natural language processing, and adaptive learning technologies, all of which analyze student data to tailor instruction based on individual needs (Sajja et al., 2024). These technologies range from intelligent tutoring systems and AI-powered chatbots to automated grading mechanisms, all designed to enhance educational outcomes and optimize instructional delivery (Zhu et al., 2024). However, while AI offers various benefits, its effectiveness is highly dependent on the role of teachers in guiding, managing, and integrating AI tools into pedagogical practice.

The evolution of AI in education has followed a trajectory from simple automation of repetitive administrative tasks, such as grading and scheduling, to more sophisticated applications that incorporate real-time data analytics, personalized learning experiences, and intelligent decision-making to support both teachers and students (Kaswan et al., 2024). Previously, the employment of AI tools was to decrease the teachers and educators' workloads such as automatic grading systems used by standardized tests i.e., IELTS and TOFEL (Zawacki-Richter et al., 2019). Therefore, with the innovative improvements in the field of artificial intelligence, there are numerous platforms and applications such as Quizzes and Kahoot that have shown the way AI can personalize learning practices to promote learner engagement (Nhan, 2025). These tools offer immediate feedback to the teachers for better time management. AI grading assessment changes the traditional grading system way better than expected due to technological improvements (Ahmed, 2023; Williamson et al., 2024). The development in technology has always impacted on the course of education worldwide by offering innovative challenges and opportunities to teachers, students, and families in educational institutions. The European Union published a scientific report directing to the policymakers "The Impact of Artificial Intelligence on Learning, Teaching, and Education" to commence an expert guidance about the cutting-edge of the AI and its potential consequences in learning, teaching, and education (Gentile et al., 2023, p. 1).

Regardless of the rapid improvement of AI in the field of education, teachers are cornerstone of integrating AI into educational institutions. AI is widely used by educators, and its impact has been demonstrated in classroom environments. The review of the literature focused on the fact that AI should not substitute teachers; therefore, it can be an effective assistant in the teaching processes, enabling the teachers to provide more specialized instruction to guide students (Dutta et al., 2024; Holmes et al., 2022).

AI technologies have significant impact on developing teaching instructions; however, the teachers should implement and contextualize these tools. Teachers and educators are accountable to generate these AI-content which align with materials and students' necessities (Ahmed & Ariannejad, 2025). Another fundamental aspect of incorporating AI into classroom practices is the role of teachers in changing the pedagogical paradigm of educational institutions, such as employing AI tools in automatic assessments in which it reduces the time and efforts of the teachers (Dimitriadou & Lanitis, 2023). Further studies proposed the effectiveness of AI tools in promoting creativity and critical thinking which generates higher order thinking. This shift emphasizes the requisite for improving teachers' awareness toward the use of AI tools, then acceptance of AI technology will occur (Chounta et al., 2022).

## *2.2 The importance of teachers in adopting and implementing AI in classrooms*

Through automation, personalized instruction, and data-driven decision-making, the integration of Artificial Intelligence (AI) in education offers significant

potential to enhance learning experiences. It is, however, the way teachers integrate AI into their pedagogical practices that determines AI's effectiveness in educational settings. Teachers must ensure that AI is used as an instructional aid rather than as a replacement for humans (Nhan, 2025). There exists a disconnect between meaningful education and student-centered learning due to AI-driven automation (Chou et al., 2024). Teachers can use artificial intelligence to create a more balanced classroom environment by using it instead of instructing directly. When integrated into existing teaching techniques, AI can be most effective for educators (Holmes et al., 2022).

It is important for teachers to understand the pedagogical role of AI and how it can be integrated into classroom practice to support effective adoption. Although AI systems can analyze large amounts of data, identify learning patterns, and provide automated feedback, they remain limited in interpreting the social, emotional, and interactional dynamics of classroom environments. For this reason, the successful use of AI in education depends not only on the availability of technological tools, but also on teachers' professional judgment, classroom awareness, and ability to use these tools in pedagogically appropriate ways. By assessing algorithms, customizing feedback accordingly, and addressing biases associated with algorithm-driven decision-making, teachers can improve the quality of algorithmic decision-making (Williamson et al., 2024). AI-assisted classrooms can be designed in such a way that teachers present can make AI more flexible, adaptable, and less of a one-size-fits-all tool.

A fundamental question in the debate about AI's role in education is whether it should be considered an autonomous teacher or a teaching aid. As described in many studies, AI has been positioned as an assistive technology that enhances teaching efficiency rather than replacing human educators (Halkiopoulou & Gkintoni, 2024). As a result of AI, administrative tasks such as grading and attendance tracking, providing immediate feedback to students, and adapting content to different learning styles have been streamlined. While AI is capable of fostering meaningful interactions between students and teachers, it lacks essential human qualities such as emotional intelligence, creativity, and adaptability. However, AI cannot replicate motivational, empathetic, and relational aspects of teaching (Xia et al., 2024).

Education still relies heavily on teachers to foster higher-order cognitive skills such as critical thinking, problem-solving, and emotional intelligence (Fakour & Imani, 2025). AI cannot fully replicate educators' ability to cultivate curiosity, facilitate discussions, and adapt lessons to students' evolving needs. A human overseer is also required because of ethical considerations surrounding AI-generated insights. AI-based educational tools sometimes reflect bias in their programming, leading to inaccurate or unfair assessments of student performance. In order to avoid reinforcing disparities or hindering equitable learning opportunities, teachers must critically assess AI-generated recommendations (Chinta et al., 2024).

The potential benefits of AI should be viewed as an enhancement of pedagogical strategies rather than as a replacement for human expertise. To integrate AI into teaching practices successfully, educators must be adequately

trained. Using AI tools to benefit their students is more likely to happen after teachers receive professional development on AI (Yang et al., 2021). AI literacy programs that lack institutional support could lead to inconsistent implementation and missed opportunities for teachers to advance.

### *2.3 Connectivism theory in AI-integrated education*

Connectivism, developed by Siemens (2005), positions learning as a process of forming, navigating, and continuously updating networks of information distributed across digital technologies, social interactions, and online environments. Unlike traditional learning theories – behaviorism, cognitivism, and constructivism – which focus primarily on internal cognitive processes or teacher-led instruction, Connectivism conceptualizes knowledge as external, fluid, and constantly shaped by technological change. In this view, learning occurs not only through personal experience but through the ability to access, connect, and utilize diverse digital nodes of information (Bell, 2011; Duke et al., 2013).

With the growing role of AI technologies in education, Connectivism provides a relevant lens for understanding how teachers interact with these tools. AI systems such as ChatGPT, Grammarly, intelligent tutoring platforms, automated assessment tools, and adaptive learning algorithms act as “knowledge nodes” within digital networks. Teachers’ engagement with AI therefore depends on their capacity to form meaningful connections with these tools, evaluate AI-generated information, and integrate digital resources into instructional practices (Javed, 2025; Strielkowski et al., 2024).

Connectivism also emphasizes the need for learners – and, in this context, teachers – to critically navigate digital environments. As AI tools present curated, personalized, and algorithmically filtered information, educators must exercise critical judgment to assess accuracy, bias, and ethical implications (Geris & Cukurbasi, 2025; Liang & Bai, 2024). In this sense, teachers are not passive recipients of AI-generated content; they serve as mediators who interpret, contextualize, and align digital knowledge with pedagogical goals.

Furthermore, AI-enhanced learning settings inherently require the development of digital literacy, ethical awareness, and adaptability. Teachers’ ability to evaluate AI outputs, use multiple digital platforms, and guide students through technology-mediated learning processes aligns closely with connectivist principles. As Corbett and Spinello (2020) highlight, effective participation in digital learning environments requires continual updating of knowledge and frequent engagement with evolving technologies – conditions that mirror the dynamic nature of AI integration in teaching.

While connectivism acknowledges the transformative potential of technology, it also underscores the indispensable role of educators. Teachers serve as connectors between students and digital resources, ensuring that AI complements rather than replacing human interaction, creativity, emotional intelligence, and contextual judgment (Abulibdeh et al., 2024; Holmes et al., 2022). For AI to contribute meaningfully to language instruction, teachers must construct

and sustain robust digital networks, enabling them to select appropriate tools, monitor student engagement, and mediate interactions with technology.

**2.3.1 Connectivism and its application.** Connectivism provides a useful framework for understanding teachers' engagement with AI-driven technologies in education. The theory views learning as a process of forming and sustaining connections across digital networks, information sources, and technological systems. In AI-supported education, this perspective is particularly relevant because teachers increasingly rely on external digital tools for lesson planning, feedback, content support, and classroom decision-making.

Connectivism directly informs the conceptualization of the three key variables examined in this study – familiarity, acceptance, and use of AI tools. Within a connectivist framework, familiarity represents teachers' initial ability to recognize and connect to technological knowledge sources, enabling them to navigate AI-supported environments. Acceptance reflects their readiness to incorporate AI into their professional networks, indicating trust in digital systems and willingness to expand their learning connections. Use of AI tools demonstrates active engagement in the digital ecosystem, where teachers apply AI resources for lesson planning, assessment, language support, and classroom management (Bell, 2011).

Connectivism also provides a theoretical rationale for examining demographic factors such as gender, age, and academic qualification. According to the theory, individuals' digital connections – and their capacity to maintain and benefit from them – vary based on experience, exposure, technological readiness, and access to digital infrastructure (Corbett & Spinello, 2020). Therefore, differences in AI engagement across demographic groups are not incidental; they reflect variations in educators' opportunities and readiness to construct digital learning networks. By grounding the study in Connectivism, the selection of variables and research questions becomes theoretically coherent, and the analysis of findings can be interpreted through a lens that emphasizes network formation, digital participation, and technological connectivity.

## 2.4 Scholarly related studies

Recent literature has shown growing interest in the role of artificial intelligence in educational practice, particularly in relation to familiarity with, acceptance of, and use of AI tools among teachers and learners. Existing studies suggest that AI engagement is shaped by several recurring factors, including demographic characteristics, perceived usefulness, prior exposure, and academic background. Rather than showing a uniform pattern, the literature points to both convergence and variation across contexts.

One prominent theme in previous research is the role of demographic differences, especially gender and age. For example, Kurshumova (2024) found that Bulgarian teachers showed varying levels of AI familiarity, with male teachers reporting higher knowledge of AI technology, while nearly half of the participants expressed interest in adopting AI tools for teaching-related



purposes such as lesson planning and test design. In contrast, Fakour and Imani (2025) reported that female participants were more willing to accept AI tools than male participants. Taken together, these findings suggest that gender may influence AI engagement, although the direction of that influence is not consistent across studies and may depend on context, population, and the specific dimension being examined, such as familiarity or acceptance.

A second recurring theme concerns age, exposure, and experience with digital tools. Zhang et al. (2023) showed that preservice teachers' intention to use AI was strongly influenced by perceived usefulness and perceived ease of use, with usefulness having the stronger effect. Similarly, Nikoulina and Caroni (2024) found that first-year students were more familiar with AI tools before university, whereas final-year students used them more deeply and in more varied ways. Apriyadi and Juwitasary (2024) also reported a strong relationship between familiarity and affective engagement in the use of AI writing tools. These studies suggest that AI engagement is not only a matter of access, but also of experience, confidence, and meaningful interaction with the technology over time.

Another important theme in the literature is the effect of academic qualification and educational level. Studies have indicated that individuals with higher academic qualifications or stronger academic positions often demonstrate greater familiarity with AI tools and more positive attitudes toward their use. For instance, Kavitha and Joshith (2025) found that participants with higher scientific titles were more familiar with and more capable of using AI tools. Likewise, Magantran and Abd Rahman (2023) reported that those holding master's and doctoral degrees viewed generative AI technologies more positively than those with only bachelor's degrees. These findings suggest that academic capital may shape the degree to which educators feel ready to understand, evaluate, and integrate AI into educational settings.

Although these studies provide valuable insights, the literature still shows several gaps. First, findings are not fully consistent across contexts, particularly regarding gender and the factors that predict familiarity or acceptance. Second, several of the studies focus on students or preservice teachers rather than in-service teachers. These studies remain relevant because they address key constructs related to AI engagement, such as familiarity, perceived usefulness, confidence, and willingness to adopt digital tools. However, in-service EFL teachers work within different pedagogical and institutional conditions, including classroom management, curriculum implementation, and assessment responsibilities. As a result, findings from student-based or preservice-teacher populations cannot be assumed to apply directly to practicing teachers. Third, limited attention has been given to the Iraqi Kurdish context, where institutional conditions, professional development opportunities, and patterns of AI integration may differ from those reported elsewhere. Therefore, further research is needed to examine how familiarity, acceptance, and use of AI tools are experienced by Iraqi Kurdish EFL teachers and how these dimensions vary across demographic groups.

3. Methodology

3.1 Design of the Study

The current research aims to assess the familiarity and acceptance of AI tools among Iraqi Kurdish EFL teachers through a descriptive quantitative research design. This design is precisely selected to describe and quantify teachers' familiarity with AI-based tools systematically. Taking into account the previously specified research questions, the study investigated whether gender-based of the familiarity and acceptability of the participants differed significantly. Furthermore, an in-depth analysis is conducted to investigate the impact of participants' educational attainment on their opinions of acceptability and familiarity with AI tools. Finally, the impact of age on the engagement with AI tools is investigated.

3.2 Participant and Context

The study included 565 Iraqi Kurdish EFL teachers from high schools and universities. The participants are from the Sulaymaniyah district of Iraq's Kurdistan. The participants were gathered using a snowball sampling technique initiated from a purposive sample of Iraqi Kurdish EFL teachers. The Google Forms link was distributed to high school teachers via the directorate of education's computerized system. The online survey was emailed to several universities in the region to the university teachers.

Table 1. Demographic profile of participants by gender and qualification

| Demographic variable | Category          | Frequency | Percent (%) |
|----------------------|-------------------|-----------|-------------|
| Gender               | Female            | 350       | 61.9        |
|                      | Male              | 215       | 38.1        |
|                      | Total             | 565       | 100         |
| Age                  | Under 30 years    | 110       | 19.5        |
|                      | 31–40 years       | 289       | 51.2        |
|                      | 41–50 years       | 166       | 29.4        |
|                      | Total             | 565       | 100         |
| Qualification        | Bachelor's degree | 311       | 55.0        |
|                      | Master's degree   | 189       | 33.5        |
|                      | PhD degree        | 65        | 11.5        |
|                      | Total             | 565       | 100         |

3.3 Data collection tool

A survey questionnaire was employed in this study to assess the acceptance and familiarity of Iraqi Kurdish EFL teachers. The survey's structure encouraged university lecturers and high school teachers to consider their approaches and share their best practices and experiences with other professionals in the

field of artificial intelligence. There were two sections of the questionnaire utilized in this study. The first section requested demographic data from the participants, such as gender, number of years of teaching experience, and whether they had bachelor, master, or PhD degrees.

The second section of the questionnaire comprised the questions created by the researcher considering the Kurdish EFL context. The survey used a 5-Likert scale. Participants were asked to choose between the following options for each question: (strongly disagree = 1 to strongly agree = 5; Never = 1 to Always = 5), which incorporated the teachers' experiences and perceptions into their teaching process. The survey consisted of 15 items in total. The questions were separated into three primary categories: acceptance of AI tools (6 questions), familiarity with AI technologies (4 questions), and uses of AI tools (5 questions).

### *3.4 Data collection procedure*

First, a request letter was sent to the electronic system of Sulaymaniyah's General Directorate of Education asking for authorization to gather data from high school teachers, a popular platform utilized by the education directorate. Regarding data collection from the university lecturers, the researcher shared the link through social media applications and their institutional email addresses. The lecturers were asked about their consent to participate in the study. Data was collected between January and March of 2025, a period of two months. Throughout the primary data collection procedure, the data were meticulously checked to guarantee completeness. When putting up the Google Forms link, great care was taken to ensure that each questionnaire required a response from the participants. A pilot study was carried out among 25 volunteer Kurdish EFL teachers to check for any errors in the questionnaire, estimate the time required to complete the survey, and examine the feasibility of the data collection approach.

### *3.5 Data analysis procedure*

The collected data was analyzed using Statistical Packages for the Social Sciences (SPSS). The t-test was conducted to ascertain whether there was significant variation between the mean scores of male and female participants in terms of their familiarity and acceptance of AI tools because of its appropriacy for comparing the means of two independent groups. Additionally, since a one-way ANOVA is appropriate for examining differences among three or more independent groups, it was used to compare the means of the academic qualification levels: bachelor's, master's, and doctoral degrees.

### *3.6 Issues of reliability and validity*

The results showed that the questionnaire's Cronbach's Alpha correlation coefficient was .84, indicating a good level of internal consistency. This suggests that the questionnaire is a reliable tool for assessing the pertinent concept.

According to the questionnaire's high Cronbach's Alpha coefficient, its items are highly correlated with one another, and results from giving it to the same people repeatedly over time are likely to be consistent. Furthermore, the Kaiser-Meyer-Olkin (KMO) score of .88 indicates a high degree of sample adequacy for factor analysis that depends on shared variance among variables. A KMO value between .90 and 1.00 is considered extraordinary, per Shrestha (2021). In terms of authenticity, only Kurdish EFL teachers from the three groups of having qualifications have been listed in the study. The survey was developed by the researcher; the scientific committee of my institution approved it. They ensured that none of the items of the questionnaire harms the participants. Finally, Large Language Models (LLMs) have been used in some parts of the research.

## 4. Results and discussions

### 4.1 Gender-based differences

This section explores the variations between male and female teachers towards familiarity and acceptance of AI tools. Both male and female teachers tend to have a diverse view regarding their engagement with AI technology. Therefore, contextual factors comprising training opportunities, institutional support, and prior exposure can have an impact on the level of acceptance. These considerations such as professional development programs by educational institutions can encourage the incorporation of AI technology in the classroom.

**Table 2.** Independent sample T-test of gender-based differences

| Variables                 | Male <sup>a</sup> |      | Female <sup>b</sup> |      | <i>t</i> (563) | <i>p</i> |
|---------------------------|-------------------|------|---------------------|------|----------------|----------|
|                           | M                 | SD   | M                   | SD   |                |          |
| Familiarity with AI tools | 13.13             | 3.72 | 14.85               | 1.73 | 6.90           | .001     |
| Acceptance of AI tools    | 19.39             | 5.74 | 22.19               | 2.82 | 7.20           | .001     |
| Uses of AI tools          | 16.65             | 4.68 | 19.21               | 2.06 | 8.25           | .001     |

Note. N=565; M = mean; SD = standard deviation; <sup>a</sup>n = 215. <sup>b</sup>n = 350; \**p* < .05. \*\**p* < .01.

Table 2 presents the findings of the independent sample t-test for the Kurdish EFL teachers' gender-based variances. Three categories were used to compare the results of engagement with AI tools: familiarity, acceptance, and uses of AI tools. A brief examination of the observed t-values made it abundantly evident that there were notable disparities between the three categories of the study which investigates the perceptions of male and female participants.

As shown in Table 2, statistically significant gender differences were found across all three dimensions. Female teachers reported higher familiarity with AI tools (M = 14.85, SD = 1.73) than male teachers (M = 13.13, SD = 3.72), and this difference was significant, *t*(563) = 6.90, *p* < .001. Female teachers also showed higher acceptance of AI tools (M = 22.19, SD = 2.82) than male teachers

( $M = 19.39$ ,  $SD = 5.74$ ),  $t(563) = 7.20$ ,  $p < .001$ . A similar pattern appeared for use of AI tools, where female teachers again obtained higher mean scores ( $M = 19.21$ ,  $SD = 2.06$ ) than male teachers ( $M = 16.65$ ,  $SD = 4.68$ ),  $t(563) = 8.25$ ,  $p < .001$ . These results indicate that female participants in this sample reported stronger engagement with AI across all three measured dimensions.

In summary, the female Kurdish EFL teachers demonstrated a greater degree of AI tools than the male ones in their perceptions in the three categories of familiarity, acceptability, and uses of AI-based technologies. In language teaching contexts, female teachers were more familiar with and understand AI tools and applications, which suggests a greater engagement and experience using these tools. Moreover, female teachers were more positively inclined to accept AI tools in educational contexts, considering the importance of these applications and tools for improving language learning. Moreover, female teachers pointed out that using AI tools in the classroom provides better opportunities for a more engaging classroom experience. Findings suggest that accepting and incorporating AI tools into EFL classrooms provide opportunities for professional development. Gender disparities may affect the ability of AI tools to be incorporated into the classroom environment.

The finding is broadly consistent with Fakour and Imani (2025), who also reported higher acceptance of AI tools among female participants, although it differs from Kurshumova (2024), where male teachers showed greater familiarity with AI. This contrast suggests that gender-related patterns in AI engagement may vary across educational and cultural contexts rather than follow a single universal trend. Therefore, the present findings are best interpreted as context-specific evidence from Iraqi Kurdish EFL teachers rather than as a generalized claim about gender and AI adoption.

From a connectivist perspective, the higher self-reported scores among female teachers may be interpreted as indicating stronger engagement with digital knowledge networks and AI-mediated professional practices. In this sense, familiarity reflects the ability to recognize and connect to AI-related knowledge sources, acceptance reflects willingness to incorporate such tools into one's professional network, and use reflects active participation in digitally supported teaching practices. However, because the present study relied on self-reported measures of familiarity, acceptance, and use, it cannot determine the underlying causes of these gender differences. Explanations related to training, institutional support, access to technology, or prior experience remain possible, but they should be treated as hypotheses for future research rather than direct conclusions from the present data.

## 4.2 Age-based differences

This section explores the Kurdish EFL teachers' viewpoints regarding the three age categories: under 30 years, 31–40 years, and 41–50 years towards the engagement with AI technology.

**Table 3.** Results of ANOVA of the age-based variations of the engagement with AI tools

| Measure                | Under 30 years |      | 41-50 years |      | 41-50 years |      | F(2, 562) | F-critical |
|------------------------|----------------|------|-------------|------|-------------|------|-----------|------------|
|                        | M              | SD   | M           | SD   | M           | SD   |           |            |
| Familiarity with AI    | 13.51          | 2.44 | 14.67       | 2.84 | 13.81       | 2.80 | 9.39**    | 3.01       |
| Acceptance of AI tools | 21.26          | 3.57 | 21.59       | 4.56 | 20.22       | 4.48 | 5.27*     | 3.01       |
| Uses of AI tools       | 18.21          | 2.87 | 18.65       | 3.50 | 17.52       | 3.87 | 5.50*     | 3.01       |

Note. \*  $p < .05$ , \*\*  $p < .01$ .

Table 3 demonstrates the results of the analysis of variance (ANOVA) one way of the three categories of engagement with AI tools across the three age groups. The means (M), standard deviation (SD), the F-value, and F-critical for the age-groups: under 30 years old, 31–40 years old, and 41–50 years old.

Regarding the first category – familiarity with AI tools, for the participants who were in the age range 31–40 years, the highest mean score ( $M = 14.67$ ,  $SD = 2.84$ ) had been reported, followed by those aged 41–50 years ( $M = 13.81$ ,  $SD = 2.80$ ) and those under 30 years ( $M = 13.51$ ,  $SD = 2.44$ ). The results of ANOVA implied a statistically significant variation among the groups,  $F(2, 562) = 9.39$ ,  $p < .05$ . Post hoc detailed comparisons further disclosed the first category – familiarity with AI tools was remarkably higher than the other categories among the participants aged 31–40 years in comparison with those under 30 years old ( $p = .001$ ) and those participants who were in the age range 41–50 years ( $p = .004$ ). Nevertheless, no significant differences were found between the two groups of participants under 30 years and those 41–50 years ( $p = .642$ ).

As far as the acceptance of AI tools is concerned, the mean scores were reasonably comparable across groups, with participants aged 31–40 years indicating the highest results in acceptance ( $M = 21.59$ ,  $SD = 4.56$ ), followed by those participants in the age range under 30 years ( $M = 21.26$ ,  $SD = 3.57$ ) and those aged 41–50 years ( $M = 20.22$ ,  $SD = 4.48$ ). The results of the ANOVA reported a significant variation among the groups,  $F(2, 562) = 5.27$ ,  $p < .05$ . Therefore, the analysis of the post hoc suggested that this variation was predominately controlled by a significant difference between the participants ages 31-40 years and those aged 41–50 years ( $p = .004$ ). There was a lack of significant differences between the participants aged under 30 years and 31–40 years old groups ( $p = .780$ ) or between the under 30 years and 41–50 years old groups ( $p = .128$ ).

In the third category – uses of the AI tools, the participants from the 31–40 years old group were acknowledged with the highest mean scores ( $M = 18.65$ ,  $SD = 3.50$ ), followed by the group under 30 years ( $M = 18.21$ ,  $SD = 2.87$ ) and those aged 41–50 years ( $M = 17.52$ ,  $SD = 3.87$ ). The results of ANOVA demonstrated a statistically significant difference among the age groups,  $F(2, 562) = 5.50$ ,  $p < .05$ . The comparison of the post hoc revealed that the uses of AI tools were remarkably higher in the 31–40-year age group compared to those aged 41–50 years ( $p = .003$ ). Therefore, among other age groups, no statistically significant differences were highlighted between the under-30 and 31–40-year-old groups ( $p = .500$ ) or between the under-30 and 41–50-year-old groups ( $p = .245$ ).

Overall, the results indicate that participants between the ages of 31 and 40 use AI tools more frequently and are considerably more familiar with the technology than participants in other age groups, especially when compared to those between the ages of 41 and 50. However, there was no discernible variation in the acceptability of AI technologies between the youngest and middle-aged groups; instead, the main disparities were seen between the age groups of 31–40 and 41–50 years. These findings demonstrate how age may affect people’s familiarity, acceptance, and usage of AI.

In contrast to Nikoulina and Caroni (2024) and Bobrytska et al. (2024), the current study presents some differences in perspectives among generations toward AI tools. In their study, Nikoulina and Caroni (2024) discovered that first-year students demonstrated more favorable perception and more proficiency in AI tools than their peers in fourth-year programs. Furthermore, Bobrytska et al. (2024) determined that those aged 17–30 expressed the greatest optimism and engagement when it came to AI. The discrepancy in findings suggests that factors beyond age may affect attitudes toward AI implementation, such as academic experience and being exposed to AI tools.

From a connectivist viewpoint, the higher scores of the 31–40 group may be interpreted as reflecting stronger participation in digital knowledge networks. In this study, familiarity may be understood as awareness of and connection to AI-related resources, acceptance as willingness to integrate those resources into professional practice and use as active engagement with them in teaching-related contexts. Under this interpretation, the 31–40 group appears to report a stronger position within digitally mediated professional learning networks than the 41–50 group. However, Connectivism here should be treated as an interpretive lens rather than a direct explanatory proof, since the study did not measure network participation, digital access, or intensity of technological exposure.

Accordingly, explanations involving training opportunities, institutional support, or prior access to technology may be plausible, but they remain hypothetical in the present study and should be framed as directions for future research rather than firm conclusions. Future studies could test these explanations more directly by including measures of professional development, institutional infrastructure, and actual frequency of AI-supported classroom practice.

### *4.3 Qualification-based differences*

This study examines Kurdish EFL teachers’ use of AI tools based on their academic credentials, including Bachelor’s, Master’s, and PhD degrees. As a result of the diverse academic backgrounds of those participating in the AI technology employment study, their experiences were effectively shaped.

**Table 4.** Descriptive statistics for engagement with AI tools of EFL teachers

| Measure                | Bachelor's degree |      | Master's degree |      | PhD degree |      | F(2,562) | F-critical |
|------------------------|-------------------|------|-----------------|------|------------|------|----------|------------|
|                        | M                 | SD   | M               | SD   | M          | SD   |          |            |
| Familiarity with AI    | 13.94             | 2.89 | 14.46           | 2.91 | 14.65      | 1.68 | 8.11**   | 3.01       |
| Acceptance of AI tools | 20.87             | 4.60 | 21.43           | 4.41 | 21.48      | 3.11 | 1.74     | 3.01       |
| Uses of AI tools       | 17.76             | 3.80 | 18.44           | 3.61 | 18.59      | 3.01 | 3.07*    | 3.01       |

Note. \*  $p < .05$ , \*\*  $p < .01$ .

Table 4 presents the results of the one-way analysis of variance (ANOVA) of the three categories of engagement with AI tools across the three groups. The data regarding the three main variables: bachelor's degree, master's degree, and PhD degree have been presented.

In the first category, familiarity with AI, the highest mean scores were reported for the participants holding PhD degree ( $M = 14.65$ ,  $SD = 1.68$ ), followed by master's degree holders ( $M = 14.46$ ,  $SD = 2.91$ ) and bachelor's degree holders ( $M = 13.94$ ,  $SD = 2.89$ ). The results of the ANOVA demonstrated notable discrepancies among the groups,  $F(2,562) = 8.11$ ,  $p < .01$ . Tukey HSD post hoc comparisons indicated that both master's degree holders and PhD holders scored significantly higher than bachelor's degree holders ( $p = .001$ ), whereas the difference between master's and PhD holders was not significant ( $p = .786$ ).

With regard to the second category, acceptance of AI tool, the participants who hold master's degree ( $M = 21.43$ ,  $SD = 4.41$ ) and the ones who were qualified with PhD degrees had the mean score ( $M = 21.48$ ,  $SD = 3.11$ ) reported significantly higher levels of acceptance compared to those who hold bachelor's degree ( $M = 20.87$ ,  $SD = 4.60$ ). Nevertheless,  $F(2,562) = 1.74$ ,  $p > .05$ , indicating that acceptance did not differ significantly across qualification levels. Tukey HSD comparisons likewise showed no significant pairwise differences.

As far as the uses of AI tools are concerned, those participants who have PhD degrees reported the highest mean scores ( $M = 18.59$ ,  $SD = 3.01$ ), followed by those with master's degree ( $M = 18.44$ ,  $SD = 3.61$ ) and bachelor's degree ( $M = 17.76$ ,  $SD = 3.80$ ). In line with these results provided by the ANOVA analysis, there is a statistically significant difference in the use of AI tools relying on educational backgrounds ( $F(2,562) = 3.07$ ,  $p < .05$ ). However, Tukey HSD post hoc comparisons did not show statistically significant pairwise differences at the .05 level. The comparison between bachelor's and PhD degree holders approached significance ( $p = .061$ ), while the differences between bachelor's and master's degree holders ( $p = .135$ ) and between master's and PhD degree holders ( $p = .910$ ) were not significant.

These results imply that while acceptability of AI technologies does not significantly vary by educational level, EFL teachers' familiarity and use of these tools are positively correlated with their degree of education. In two of the categories: familiarity with and uses of AI tools, PhD holders have higher mean scores showing a more positive attitude toward the engagement of AI tools. On

the other hand, master's degree holders have higher mean scores in accepting AI tools.

As a result of the high level of research expectations on university lecturers, it may be that some of the participants with PhD degrees are more engaged with AI tools owing to higher research expectations. Therefore, this implies that lecturers who hold PhDs will have to engage more with AI technology and digital resources in order to become more digitally literate, which in turn will help them become better digital learners. It has been demonstrated that teachers with a doctorate degree have a higher score of positive attitudes when compared to those who have a bachelor's degree as a teacher. To create lectures, develop tests to evaluate students or introduce new subjects, publish scholarly articles, make presentations, and provide feedback, they use artificial intelligence (AI) technologies. Those findings are consistent with those of studies undertaken by (Kavitha & Joshith, 2025; Magantran & Abd Rahman, 2023; Zhu et al., 2024) that examined teachers' perspectives on using AI tools. There was also a significant correlation between having higher educational qualifications and having a more positive attitude toward the familiarity, usage, and acceptance of AI tools, as well as a higher level of appreciation for them.

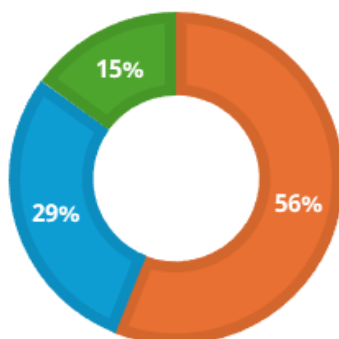
These results may also be impacted by the differences in training and curriculum among educational levels. It is likely that postgraduate programs will integrate topics related to artificial intelligence into conventional undergraduate programs. This is consistent with the present findings, since more-educated individuals have more exposure to AI, which enhanced their knowledge and ability to use these tools. Postgraduate students and faculty members who attend conferences, workshops, and professional development programs related to AI may be better equipped to use AI tools effectively, so job experience and institutional support may be valuable as well. The level of academic qualifications also affects AI engagement. Teachers with PhDs reported significantly higher levels of AI engagement, possibly due to an increase in academic research, content creation, and assessment tools that use AI. AI-based tools are increasingly useful to those involved in academic research, particularly those who write research papers, develop assessments, or create teaching materials. The use of AI beyond basic classroom applications may be limited by those with only a bachelor's degree. Finally, PhD holders' greater engagement may indicate better-developed digital knowledge networks due to research demands, consistent with Connectivism.

#### *4.4 Teachers' attitude towards their engagement with AI tools*

This section presents the attitudes – positive, neutral, or negative – of the Iraqi Kurdish EFL teachers regarding their engagements with AI tools, especially language teaching and education. It further reveals that the fundamental elements impact on their acceptance or rejection of AI-technologies for educational practices.

# Familiarity with AI Tools

Positive Neutral Negative



**Figure 1.** Teachers' perceptions on familiarity with AI tools

The familiarity with AI tools deals with the level of familiarity of teachers with the concepts of AI tools in education to prepare lesson planning, material preparation, and designing assessments. It further addresses to what extent these tools – ChatGPT, Grammarly, QuillBot, and other tools – are supportive in teaching environment. Figure 1 presents the Iraqi Kurdish EFL teachers' perceptions towards their familiarity with AI tools. As can be seen, a majority of the respondents showed positive attitudes (56%) regarding their familiarity with AI-based technology. On the other hand, a small group of participants, 15%, showed negative attitudes to utilizing AI-driven applications. Furthermore, 29% of the participants showed neutrality in their attitudes, indicating that they were familiar with the topic to a moderate extent.

These results suggest Iraqi Kurdish EFL teachers are familiar with and use AI tools in relation to their educational background since a good proportion of them are familiar AI-powered technologies for their academic practices. The findings of the present study reflect those of Kurshumova (2024) who also found that a high percentage of Bulgarian teachers have familiarity with AI tools. Therefore, there are many teachers who lack confidence or exposure to these AI-technological tools. For those who lack confidence with the employment of AI tools, there is a possibility that the results of this study could be explained by the fact that AI and digital literacy are not taught equally at all levels of education. In higher education, especially master's and doctoral degrees, digital literacy and technological involvement are more prevalent. For that reason, higher education degree holders are more likely to understand and use AI since more research is relying on AI-powered solutions such as data analysis software, automatic writing assistance, automated grading systems, and plagiarism detection. The lack of opportunities to interact with AI-driven tools during undergraduate education might have limited exposure to and use of these tools for those with bachelor's degrees. It is evident from this variation in familiarity that there is a need for educators to undergo targeted professional development programs in order to enhance their AI literacy. It can be

concluded that there is digital inequality as closely one third of the teachers and educators show negative attitudes regarding AI-based tools. It might be due to the socioeconomic factors such as low-class areas having difficulties reaching internet, high-tech devices, technological infrastructure for the educational institutions (Ahmed & Ariannejad, 2025).

## Acceptance of AI Tools

Positive Neutral Negative

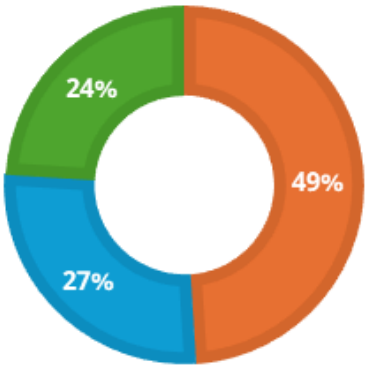


Figure 2. Teachers’ perceptions on acceptance of AI tools

The acceptance of AI tools category highlights the importance of integration of AI-based platforms in education, the way it improves teaching efficiency and motivates students’ engagement with ease in daily teaching activities. Figure 2 presents the Iraqi Kurdish EFL teachers’ perceptions about the acceptance of AI tools in their classrooms. Based on the donut chart, it can be shown that almost half of the teachers have positive attitudes toward the adoption of AI-tools in their classroom teachings. A closely quarter of the teachers, 27%, have neutral – neither positive nor negative – perceptions. They particularly did not show their preferences for AI-based technology, indicating an undecided stance toward its acceptance. Moreover, only 24% of the participants showed negative attitudes regarding these AI-based technologies, implying lower acceptance of these AI-tools for their classrooms.

It can be concluded that a quarter of Iraqi Kurdish EFL teachers who are aware of the benefits of integrating AI into their teaching practices appreciate the promising power of AI-tools in educational practices. Teachers are progressively encompassing AI-based applications in their classroom environment since they believe these tools improve the quality of their teaching and more importantly students will benefit from enhancing their language skills. The literature shows the comprehensive teaching environment in Kurdistan region of Iraq which underlines major reasons for accepting AI-tools. Consistent with the literature, this research found that participants who reported using positive views regarding AI-driven technologies, (Rasul & Shareef, 2025), also confirmed

that Kurdish EFL teachers discern the effectiveness of AI-applications in enhancing students four primary language skills: reading, writing, listening, and speaking and pronunciation skills.

On the other hand, there is still a large number of educators who are hesitant or resistant to using AI in their teaching practices, as indicated by these findings. Nearly half of the teachers and educators present negative or neutral beliefs regarding the acceptance of AI-tools, which might result from ethical and practical considerations. Those teachers who hold negative viewpoints toward AI-driven technologies are concerned about academic integrity and the ethical implications of AI-generated content in their classroom environment. Furthermore, teachers believe that using AI-driven tools might bypass the learning process and make them rely solely on these tools. They are also concerned about data privacy and content bias within AI algorithms. Another significant reason might stem from the lack of teacher training in effectively incorporating AI-based applications into their classrooms. To ensure teachers feel more comfortable and prepared to use AI in the classroom, additional training and exposure to AI tools is critical. For this reason, educational institutions should provide continuous professional development courses for teachers to upgrade their digital skills and align them with the requirements of 21st-century skills. This also accords with the earlier observations by Shareef (2024), which showed that nearly half of the participants of her study showed worriedness and doubtfulness about employment and acceptance of AI-based tools in teaching classrooms.

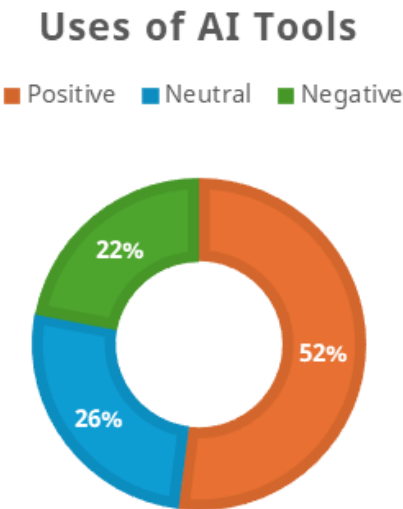


Figure 3. Teachers’ perceptions on uses of AI tools

The uses of AI tools emphasize the frequency of employing AI-based tools in teaching practices such as lesson planning, material development, grading assessments, or designing tasks and activities. It further focuses on the advantages and limitations of using AI-driven technology in classroom environments. Figure 3 presents the Iraqi Kurdish EFL teachers’ perceptions regarding the

uses of AI tools. According to the data, a high proportion of the teachers, 52%, showed positive attitude towards the employment of AI tools in their classroom environment. On the other hand, the smallest percentage of the teachers, 22%, reported that they had negative attitudes about AI-based technologies in their educational activities. In addition, about a quarter of the teachers had neutral attitudes, signifying indecisive position in their perceptions whether or not to utilize AI-based application in their classroom practices.

It can be stated that a high portion of the teachers utilize AI-driven tools in their classroom environment. Therefore, substantial numbers are hesitant to use these tools since they show uncertainty in using these AI-based technologies in educational practices. Hence, it is important to provide additional training and awareness programs to ensure all teachers can effectively use AI to enhance their teaching and learning. The primary reason for high usage of AI-based applications might be due to its adaptability for doing various types of academic tasks in such a short time. Furthermore, it has time saving features for teachers and educators such as creating quizzes and assignments and grading them instantly which saves hours of working in large-scale educational contexts. In accordance with the present results, previous studies such as Mathes et al. (2023) have demonstrated that tertiary education students use AI tools with high percentages in their educational practices. There are a wide variety of factors that influence AI familiarity and usage across educational levels, including shared beliefs, ethical concerns, and external barriers, but this study emphasizes the importance of educational exposure, research requirements, and institutional support. The effectiveness of focused AI training initiatives should be assessed more comprehensively to ascertain if they can address teachers' concerns and close the knowledge and usage gap at the same time.

On the other hand, a lack of professional development and teacher training is just one of the factors to consider. The use of comprehensive workshops and hands-on training sessions can increase teachers' comfort level with AI tools. The creation of supportive communities within which educators can share their experiences and best practices about integrating AI may be helpful for educators as well. In addition, teachers should be part of the development and customization of AI tools in order to make sure that these tools meet their specific teaching needs. In the absence of digital pedagogy, traditional teaching methods will be a limiting factor for AI integration. AI technologies may not be fully explored by teachers if policymakers do not actively promote them.

## 5. Conclusion

Artificial intelligence has become increasingly relevant in education, including language teaching. This study examined Iraqi Kurdish EFL teachers' familiarity with, acceptance of, and use of AI tools in relation to gender, age, and academic qualification. The study included 565 Kurdish EFL teachers from high schools and universities in the Sulaymaniyah district. The findings showed that female teachers reported higher familiarity with, acceptance of, and use of AI tools than male teachers. In addition, teachers aged 31–40 reported the highest

levels of familiarity and use, while academic qualification was associated most clearly with familiarity with AI tools. PhD holders reported the highest mean scores across the three dimensions, although the strongest statistically supported difference concerned familiarity rather than acceptance or use.

These findings suggest that teachers' engagement with AI tools is not distributed uniformly across groups. Rather, reported engagement appears to vary according to demographic and academic factors. At the same time, because the study relied on self-reported measures, the findings should be interpreted as reported perceptions and practices, not as direct evidence of actual classroom competence or frequency of use.

The study also has practical implications. The results point to the value of professional development opportunities that support teachers in developing informed and confident engagement with AI tools, particularly in groups reporting comparatively lower levels of familiarity or use. Such support may help teachers evaluate AI tools more critically and integrate them more appropriately into language teaching practice.

Several directions for future research emerge from this study. Qualitative methods, such as interviews and focus groups, could provide deeper insight into teachers' motivations, concerns, and experiences with AI tools. Longitudinal research could examine how familiarity, acceptance, and use change over time as AI tools become more embedded in educational practice. Comparative studies across regions and institutional settings could also help determine which patterns of AI engagement are context-specific and which are more general. In addition, future research could investigate barriers to AI adoption more directly, including access to technology, training opportunities, and institutional support, rather than inferring these factors indirectly.

According to connectivist theory, the findings may be interpreted as indicating differences in how teachers connect to and participate in digital knowledge networks. Within this framework, familiarity reflects awareness of AI-related knowledge sources, acceptance reflects willingness to incorporate such tools into professional practice, and use reflects active engagement with them in teaching-related contexts. The variation observed across gender, age, and academic qualification therefore suggests that participation in these digital networks is uneven and shaped by different forms of readiness and opportunity. In this sense, the study contributes to understanding AI tools not only as technological resources, but also as part of broader networked learning environments in which teachers' engagement develops through connection, adaptation, and ongoing professional interaction.

## Declarations

**Availability of data and material.** Yes.

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**Research involving human participants.** This study adhered to the ethical guidelines of the Declaration of Helsinki and National Laws. The study was

approved by the ethical review board at the author's institution. Participants were informed about the research regulations. verbal Informed consent was obtained from all participants.

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