

The Technology Acceptance Model in EFL Contexts: Examining Motivation as a Mediator Between Teachers' Writing Self-Efficacy and AI Adoption

Bahar Taheri¹, Majid Farahian^{1, *}

¹ Department of Foreign Languages Teaching, Ker.C., Islamic Azad University, Kermanshah, Iran

Corresponding Author's Email: majid.farahian@iau.ac.ir

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ABSTRACT

Despite extensive research on self-efficacy, motivation, and artificial intelligence (AI) in English as a foreign language (EFL) education, their interrelationships remain underexplored. This study targets Iranian EFL teachers' self-efficacy in writing, their writing motivation, and tendency to use AI in academic writing by examining the relationship between these constructs. A quantitative, correlational design was employed. A total of 250 EFL teachers were selected via convenience sampling and completed three validated scales: The Academic Writing Self-Efficacy Questionnaire (AWSEQ) to measure writing self-efficacy, the Motivation in Writing Questionnaire (Cahyono & Rahayu, 2020) to measure writing motivation, and the AI Acceptance in Academic Writing scale (Farahian & Rezaee, 2025) to measure AI acceptance. Pearson correlation analyses indicated a strong, positive relationship between self-efficacy and motivation, and weaker but significant relationships between motivation and AI acceptance and self-efficacy and AI acceptance. Furthermore, Structural Equation Modeling (SEM) revealed that teachers' self-efficacy in writing acted as a significant predictor influencing motivation and the tendency to use AI in writing. Furthermore, motivation in writing was identified as a significant partial mediator between self-efficacy and AI acceptance. This suggests that while teachers' confidence directly encourages AI use, a portion of its influence works by first boosting their motivation to write. The results of the study are analyzed in the light of the available literature and suggestions for further studies have been presented.

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Introduction

AI is referred to as a promising channel to strengthen teaching quality and maximize learners' rate of learning (Zhai et al., 2021), has been an appealing strategy in education due to many reasons comprising the enhancement of understanding among educators, providing easier access to multiple sources of data simultaneously, and paving the way for easier teaching and learning through introducing more creative strategies (Kizilcec, 2024). In addition to the role of AI in general, multiple studies have investigated the role of AI in EFL Writing and how it affects the performance of teachers in this regard. For instance, Marzuki et al. (2023) state, teachers strongly support the role of AI in developing skills like writing since this is in direct connection with the quality of the writing, despite the experienced limitations and challenges. This implies that the use

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of AI-related tools tends to improve better quality of writing and nurtures teachers' confidence in providing a better writing quality and instruction.

Having established that integrating AI plays a dominant role in enhancing EFL education in general, and teachers' writing skills in particular, multiple studies have addressed the factors that may predict teachers' attitude toward using AI in their classes. In other words, many studies to date have investigated how and to what extent AI-based tools are accepted and used by teachers in EFL education. For instance, it has been stated that the effectiveness of AI tools and devices is an influential element in encouraging teachers to use AI-based applications in their teaching process (Du & Gao, 2022). Furthermore, it has been stated that EFL teachers find AI more appealing in their classes if they are enthusiastic and confident in using it (Huang et al., 2024).

This study is grounded in the Technology Acceptance Model (TAM), which provides a theoretical understanding of the factors involved in individuals' willingness to adopt new technologies. Consequently, this study draws on TAM to explain how EFL teachers perceive the adoption of AI-assisted academic writing tools in their own practices. Specifically, TAM suggests that users' acceptability of technology is determined by the user's perceptions of the technology's perceived usefulness and ease of use (Davis, 1989). For this study, we define "AI" as AI-assisted academic writing tools (e.g., Grammarly, QuillBot, ChatGPT), which include writing assistance features such as grammar checking, paraphrasing, and generative writing.

Another important concept that has always been investigated in multiple studies is the notion of self-efficacy (Usher & Pajares, 2008), which has a significant impact on both actual and online teaching and learning environment (Yokoyama, 2019), and influencing teachers' and students' academic achievement in higher education (Ayllón et al., 2019). The concept of self-efficacy, as originally proposed by Bandura (1997), refers to an individual's ideas or judgments of their abilities to accomplish or execute a task. Numerous studies have indicated that self-efficacy in writing strategies impacts the teachers' writing ability in an EFL context (see Khosravi et al., 2017).

Another factor that is equally critical and needs further investigation is motivation. Inspired by the significance of this concept, studies have also investigated motivation in writing and, more importantly, the factors that have an impact on this element. In general, it is stated that the extent to which EFL teachers feel motivated to write and use their motivation to push them forward in writing is referred to as writing motivation (Hidi & Boscolo, 2006). In other words, writing motivation is defined as the degree of teachers' desire and willingness to write that is driven by their personal interest in writing. As they argued, this motivation, which originates from teachers' intrinsic motivation is critical to making high-quality writing possible.

Given the established importance of AI, self-efficacy and motivation in teaching practices, the present study addresses the gaps in the literature, specifically the under-researched relationship between self-efficacy, motivation, and AI acceptance in the context of academic writing, and the neglected role of motivation as a mediator. In particular, we sought to analyze the relationship between these constructs among Iranian EFL teachers. This area of research is essential to move beyond the analysis of single factors and provide a more integrated and nuanced understanding of the psychological mechanisms that are important to EFL teachers' acceptance of AI technologies.

Literature review

Artificial Intelligence (AI)

The use of AI in education has been extensively researched; researchers have studied and defined the role and effectiveness of AI in education from different perspectives (Kafi et al., 2025; Kashef & Khabazian, 2026; Moazami Godarzi et al., 2025). Three distinct themes were identified in the literature review: 1) use of AI as an instructional assistant; 2) use of AI to support research, assessment, and/or evaluation of student performance; 3) use of AI as a transformative element in educational dynamics. However, a detailed critical review of the available literature indicates that while many of the available studies provide general concepts about the role and potential benefits of using AI in education and/or of how to evaluate students with AI, very few studies have examined the psychological factors (cognitive, motivational, etc.) that influence teachers' decisions to use AI in their classrooms, and/or studied the contextual issues regarding teachers' use of AI in their classes.

First, a prominent theme characterizes AI as a supportive tool that enhances instructional quality and the teacher-student relationship. For instance, Guilherme (2019) established that AI has transformed teacher-student dynamics in the classroom, significantly influencing the social, political, and economic aspects of teaching. In addition to Guilherme's work mentioned above, Felix (2020) suggests that while AI does not have the capabilities of a human instructor, it is an excellent complement to an instructor and has the potential for a major impact on classroom instruction. Collectively, these ideas indicate that AI provides an opportunity for a teacher to build a better instructional relationship with their students, and AI can assist a teacher in developing and providing a higher level of instructional quality; however, conceptualizing the means by which a teacher can engage with their students was not the primary focus in these studies.

The second category of findings in the literature is an emphasis on the logistical possibilities that Artificial Intelligence has offered for Education. AI has been viewed as a facilitator in streamlining procedures for administrators with respect to conducting assessments and conducting research as stated by Bhise et al. (2022). Bhise et al. framed the role of AI as an assignment assistant that allows individuals to focus on their jobs by lessening the time consumed by administrative responsibilities. Additionally, from the perspective of advancing research, Tahiru (2021) viewed AI as a significant contributor to the growth and enhancement of research in developed countries and the expansion of academic inquiry. Although this theme illustrates how AI will assist in improving efficiency and transaction times in the research, it does not consider how personal beliefs, or the efficacy of the instructional staff, will influence their willingness to use AI to support that particular purpose as described.

The third and most current category is that of measuring how AI has affected students during the Learning Process and Learning Outcomes. Hu (2024), through a meta-analysis of the literature, has also compiled evidence that supports the use of AI-empowered Personalized Learning Methods to positively affect the educational process. While the findings from Hu's meta-analysis do show the effectiveness of employing the use of AI, they primarily focus on how students will be the primary users of this technology rather than focusing on the teachers who will need to implement the technology. Therefore, there exists a gap due to the fact that how well AI is

leveraged in the classroom depends heavily on the teacher acting as the mediator between students and the use of AI.

Factors Influencing Teachers' Perceptions Toward Using AI

Apart from defining the notion of AI and how it impacts the productivity of teaching and learning in the EFL context, multiple studies have also examined the factors that impact the use of AI and teachers' perception toward using it. In this respect, Sumakul et al. (2022) have established that AI is filled with benefits when it comes to using it in the EFL context. Different predictors that may impact teachers' perceptions of using AI should be taken into consideration, nevertheless. Precisely, the study highlights the role of teachers' competence in using technological devices as a significant predictor of using AI. Therefore, if teachers are more knowledgeable in using AI, they can use such a tool more frequently and more easily compared to those who do not possess the required knowledge. This technological competence can be seen as a domain-specific facet of self-efficacy; a teacher's confidence in their ability to operate AI tools (i.e., their self-efficacy for technology use) likely underpins their perceived competence and, consequently, their acceptance.

Tram and Tran-Thanh (2024) have stated that there are many factors that impact teachers' perceptions of using AI and their acceptance of using AI, however, the existence of a supporting environment in which teachers are supported by their managers and administrators is of utmost importance. In other words, despite their likelihood to use AI, teachers are critically reliant on the context in which they teach to support them for using such tools. Such external support can function as a facilitating condition that may bolster a teacher's self-efficacy by reducing perceived barriers and can also serve to sustain their motivation to engage with new technologies over time. Alruwaili et al. (2025) established that AI-based instructions are necessary and productive for teachers and teaching in class, however, the extent to which AI assists or replaces teachers in class is entirely dependent on their motivation, creativity, and sense of critical thinking while using such tools. This means that the extent to which teachers hold a perception toward using AI as their assistant or their replacement is predicted by their creativity and critical understanding of using AI in class. This directly implicates teachers' motivational orientation and self-regulatory beliefs, aligning with the core psychological constructs of motivation and self-efficacy examined in the present study.

AI in EFL writing

Despite the extensive research conducted on the notion of AI, its definition, and how different factors influence it, multiple studies have investigated EFL teachers' use of AI in writing and how it is influenced by other factors. For instance, Liu and Chang (2024) conducted a longitudinal study on a group of EFL teachers to examine their attitude toward using AI in their writing instruction. As the results indicated, teachers' adaptive expertise and their ability to be accustomed to the use of AI in their writing tasks were referred to as significant predictors in this regard.

Further, Alghasab (2025) discovered that AI writing tools facilitate various stages of the writing process and offer support for students to brainstorm ideas, expand their vocabulary, and improve the precision of their writing. The results further suggest that although students recognize the possible advantages of utilizing AI writing tools, they also express apprehension about the lasting effects of such tools on the cultivation of their autonomous writing abilities. In addition, Ahmadi Fatalaki et al. (2024) stated that it is the experience of the teachers toward the usefulness of such a tool, that predicts their positive or negative attitudes about using AI in their writing procedure.

In other words, it has been claimed that teachers with more positive beliefs over the usefulness of Artificial intelligence carry more positive attitudes toward the use of such tools in their career.

While these studies effectively map teachers' adaptive skills and beliefs as predictors, they often treat these factors as isolated variables. A critical gap remains in understanding how these practical and belief-based factors interact with deeper psychological constructs, such as a teacher's fundamental confidence in their own writing ability (self-efficacy) or their intrinsic drive to write (motivation). Although research on AI in writing is growing, deeper insight is still needed in the field of AI so as to broaden the viewpoint over its usage in the EFL context (Pan & Wang, 2025). The present study addresses this need by proposing that self-efficacy and motivation are foundational psychological mechanisms that may underlie and influence the more surface-level adaptive skills and perceived usefulness discussed in prior research.

Self-efficacy in Writing

To investigate whether students' writing performance in an EFL context is related to self-efficacy in writing, Işık (2010) found a positive correlation between EFL students' writing self-efficacy and their performance in their classes. In other words, students with higher levels of self-efficacy have a higher level of capability in writing and are more willing to take part in tasks. In the same line, Blasco (2016) stated that self-efficacy triggers learners' metacognitive strategies in writing. In a study conducted among six upper-secondary-school Spanish EFL students, participants' self-responses to a series of questionnaire items have revealed that a positive correlation between writing metacognition and writing self-efficacy exists. This means that if learners have higher levels of self-efficacy in writing, their awareness and understanding of their own thinking processes in writing increase significantly.

However, a more recent study by Khojasteh et al. (2016) found that students' self-efficacy in EFL writing and their performance are not significantly correlated, suggesting that other factors beyond self-efficacy may impact students' writing performance. In a study conducted at a Turkish University, Bektaş-Çetinkaya (2020) referred to the concept of self-efficacy in writing as a promising factor in enhancing EFL writing skill. The results of the study indicated that although individuals' self-efficacy in writing does not change based on their gender or their English language proficiency, it positively influences their performance in writing different tasks.

While the body of research directly examining teachers' writing self-efficacy is smaller, the underlying psychological mechanisms of self-efficacy are theorized to function similarly across populations (Bandura, 1997). The studies cited here, though focused on students, establish the foundational relationship between the construct of writing self-efficacy and key outcomes (e.g., performance, strategy use). This provides a theoretical basis for examining the same construct within a teacher population, with the understanding that the context and manifestations may differ.

Theories concerning self-efficacy for writing establish a connection between the self-efficacy for writing and acceptance of AI technologies. Teachers who possess higher levels of self-efficacy for writing may view AI writing tools as complementary tools that increase their effectiveness as teachers instead of seeing them as tools that provide help for deficiencies. This creates a greater belief in the usefulness of using the AI technology, aligning with the TAM as developed by Davis (1989). In addition, greater self-efficacy fosters a stronger sense of agency and openness to innovation (Mohebi Amin et al., 2022), making teachers more inclined to explore and adopt new technological aids in their professional practice.

Motivation in Writing

Motivation has been defined in the literature in many different studies. Having highlighted the internal aspects of motivation and their importance, Mitchell (1982) defined motivation as a necessary element in deciding the direction of a decision. In the EFL context in particular, multiple studies have defined motivation with respect to its impact on teachers and learners. In this respect, many studies have found that motivation can be defined through the impacts it has on learners (He, 2024; Vonkova et al., 2021). Among all these factors, writing is not an exception. In their study, Zhang and Guo (2012) examined students' writing motivation among a group of EFL Chinese learners. As the results indicated, self-efficacy in writing and language learners' proficiency level were among the significant predictors of motivation in writing. This means that if learners are highly efficacious with respect to their writing and have an acceptable level of proficiency in this area, they can experience a higher level of motivation for writing. Yu et al. (2020) stated that the feedback that is received as the result of a writing production is in direct association with motivation in writing. As the authors found, the process of corrective feedback on writing impacts learners' encouragement or discouragement in writing.

Motivation is a key factor in supporting an individual's ability to engage with and develop their writing. Therefore, a teacher's motivation towards writing can serve as a significant psychological resource for their own development and willingness to try out new techniques. Specifically, this internal motivation may affect how teachers view AI writing tools, either as opportunities for growth, or as distractions that have nothing to do with them (Alruwaili et al., 2025).

The present study

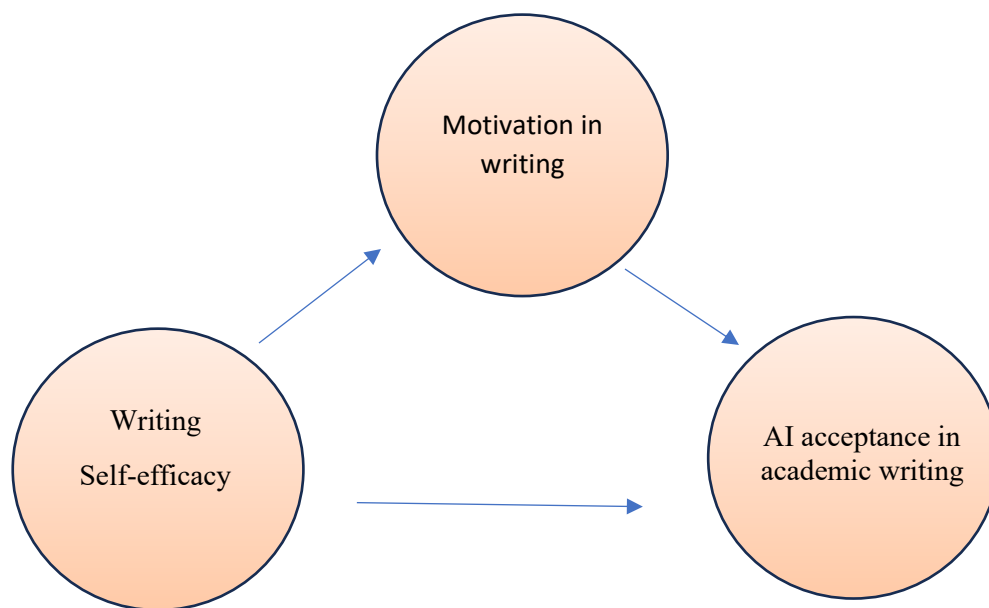
Throughout the literature in the EFL context, teachers' self-efficacy in general has been largely investigated due to its significant impact on enhancing the quality of teaching and learning (Choi & Lee, 2018; Liu et al., 2024; Rastegar & Memarpour, 2009). Furthermore, multiple studies have found that possessing a higher level of self-efficacy leads to a higher level of stability by motivating teachers to act better during their teaching process (Shengyao, 2024), keeping them away from experiencing burnout in EFL classes (Fu et al., 2024), positively influencing their feelings toward in-class actions (Zhi et al., 2024). However, despite the extensive research addressing the significance of self-efficacy and how it influences various factors in EFL contexts, a clear gap exists in understanding how a teacher's foundational psychological resources—specifically, their self-efficacy in writing and their motivation to write—interact to influence their adoption of AI tools for academic writing. Prior research has often treated these constructs in isolation or focused on other outcomes.

Building on this identified gap, and additionally, despite the extensive research focused on the factors influencing EFL teachers' motivation in writing, the potential mediating role of motivation in writing in the context of technology adoption has been largely ignored. To address these gaps, this study proposes and tests a theoretical model (see Figure 1) that extends the Technology Acceptance Model (Davis, 1989) by integrating key constructs from social cognitive theory (Bandura, 1997). The hypothesized mediation model posits that a teacher's writing self-efficacy (a core cognitive belief) influences their AI acceptance both directly and indirectly by enhancing their motivation to write (a key affective driver). Focusing on Iranian EFL teachers provides a valuable context, as the integration of AI in education is a growing but under-researched phenomenon there, and understanding the psychological drivers of adoption can inform effective implementation strategies within this specific educational environment.

Finally, the current study addresses another gap in the literature related to teachers' attitudes toward using AI. AI is highly beneficial as it enhances the assessment of instructors by providing better support for institutions in this regard, and establishes a more disciplined mechanism for protecting and managing information in EFL education (Jiang, 2022). Furthermore, the integration of intelligent systems into EFL teaching can significantly improve the educational environment and overall effectiveness of the teaching process (Alhalangy & AbdAlgane, 2023). A large number of studies have also mentioned that teachers' attitudes toward using AI has been positively or negatively influenced by many factors (e.g., Alasmari, 2024; Huang et al., 2024). However, despite extensively addressing the notion of teachers' attitudes toward using AI, studies have missed examining how teachers' attitude toward using AI in the field of academic writing can be influenced by their motivation in writing and their writing self-efficacy. Therefore, how teachers' perception of using AI-based services is influenced by their writing self-efficacy and motivation in writing needs further exploration.

Figure 1.

Theoretical Model of the Study



Research questions:

RQ1. Is there any significant relationship between English instructors' writing self-efficacy and their motivation in writing?

RQ2. Is there any significant relationship between English instructors' motivation in writing and their AI acceptance in academic writing?

RQ3. Is there any significant relationship between English instructors' writing self-efficacy and their AI acceptance in academic writing?

RQ4. Does English instructors' motivation in writing mediate the relationship between their writing self-efficacy and AI acceptance in academic writing?

Method

Participants

A total of 250 Iranian EFL teachers were recruited to respond to a number of questionnaire items about writing self-efficacy, motivation in writing, and perceptions of using AI in academic writing. The participating teachers were recruited from the two major educational contexts in Iran (public schools and private institutes) and aged between 19 and 55. Regarding gender distribution, the sample consisted of 165 female (66%) and 85 male (34%) teachers. Also involved in this study were a number of university students majoring in English Language Teaching with some teaching experience. The instructors possessed diverse experience levels ranging from 2 to 27 years. The educational qualifications they held included M.A. (79%), and Ph.D. (21%). The participants' academic majors were English Language Teaching (70%), Translation (21%), and Literature (9%). With respect to the procedure of data collection, convenience sampling was employed by the researchers to choose the participants for the study, and they ensured that participation was both voluntary and anonymous. Participants were informed that they had the option to withdraw from the study at any point if they wished for.

Instruments

There were three instruments in this study

Academic Writing Self-Efficacy Questionnaire (AWSEQ)

The Academic Writing Self-Efficacy Questionnaire, which was created and validated by Teng and Wang (2022), was utilized to evaluate the instructors' perceptions regarding their linguistic knowledge, self-competence in writing abilities, organization of information, writing performance, and memory and practice skills. It was developed through a multi-method approach that included writing assignments, semi-structured interviews, and an analysis of previous research. The completed version comprises 30 items, focusing on five key dimensions: linguistic knowledge efficacy (LKE), self-regulatory efficacy (SRE), information organization efficacy (IOE), writing performance efficacy (WPE), and rehearsal and memory efficacy (RME). For data collection, a 5-point Likert scale was employed, as responses from various item types are generally more accurate when measured on such a scale. Cronbach's alpha reliability evaluations showed an average reliability range for the five variables, with values between 0.79 and 0.85.

AI Acceptance in Academic Writing

The scale developed by Farahian and Rezaee (2025) is based on the TAM proposed by Davis (1989). The original scale developers reported satisfactory reliability indices for its subscales. As reported by the researchers, exploratory factor analysis (EFA) was conducted to examine the scale's structure. The initial Kaiser-Meyer-Olkin (KMO) measure was 0.69. After the removal of four items with factor loadings below 0.50, the KMO improved to an acceptable 0.77. Bartlett's Test of Sphericity was significant ($\chi^2(478) = 5346.11, p < 0.001$). A principal component analysis with Varimax rotation confirmed the five-factor structure, with all remaining 27 items loading acceptably on their intended constructs: perceived usefulness (8 items), perceived ease of use (4 items), attitudes towards use (4 items), behavioral intentions to use AI (5 items), and AI digital literacy in academic writing (6 items). The scale demonstrated good internal consistency in this

study (Cronbach's $\alpha = 0.82$). A 5-point Likert scale is utilized, ranging from strongly agree to strongly disagree.

Motivation in Writing Questionnaire

The scale was developed by Cahyono and Rahayu (2020). There are 23 items in the scale and Responses vary from “strongly agree” (6), “agree” (5), “slightly agree” (4), “slightly disagree” (3), “disagree” (2), to “strongly disagree” (1). While the original study established its construct and content validity, it did not report a reliability coefficient. For the present study, the scale's internal consistency was confirmed, demonstrating good reliability (Cronbach's $\alpha = 0.79$).

Data Collection

To collect the necessary data, the researchers initially utilized convenience sampling to gather the target participants. Subsequently, 250 questionnaires were distributed to the participants through email and various social networks. The questionnaires were first sent as email attachments. The collected data was then imported into SPSS 24.

Data Analysis

The data was assessed using the SPSS program and was then uploaded to AMOS for SEM analysis. The study employed validity, reliability, normality, and descriptive statistics. The hypothesized structural model was tested using Covariance-Based Structural Equation Modeling (CB-SEM) in AMOS. This allows for the simultaneous estimation of all direct and indirect paths within the model and provides established goodness-of-fit indices. The data was then uploaded to AMOS with the aim of analyzing the hypothesized model and estimating the model fit indices.

To assess the normality of the data distribution, the Kolmogorov-Smirnov and Shapiro-Wilk tests were employed. Furthermore, Cronbach's alpha was calculated to assess internal consistency. These assessments allowed the researchers to rigorously evaluate the reliability of our data. Following that, the relationships between variables were explored through Pearson product-moment correlations. To determine if the proposed conceptual model is appropriate, the researchers employed goodness-of-fit measures within a SEM analysis. To assess the statistical significance of indirect associations, a bootstrapping procedure was utilized.

We selected the statistical procedure based on standard practices for testing mediation models with observed variables (Kline, 2023; Preacher & Hayes, 2008). Preliminary analyses in SPSS were run to ensure data quality and examine basic relationships. SEM in AMOS was chosen as the primary analysis because it allows for the simultaneous testing of all hypothesized direct and indirect (mediating) paths within the proposed model. This provides a comprehensive test of our theoretical framework (Hair et al., 2019).

The model's goodness-of-fit was evaluated using the following absolute and incremental indices with their respective cutoff criteria (Kline, 2023): The Comparative Fit Index ($CFI > 0.90$), the Tucker-Lewis Index ($TLI > 0.90$), the Root Mean Square Error of Approximation ($RMSEA < 0.08$), the Standardized Root Mean Square Residual ($SRMR < 0.08$), and the chi-square to degrees of freedom ratio ($\chi^2/df < 3.0$).

Design of the Study

The current study follows a quantitative design. Covariance-Based Structural Equation Modeling (CB-SEM) was used to investigate the possible relationships between Iranian EFL teachers' self-efficacy in writing, their motivation in writing, and their perceptions of using AI in academic writing. Furthermore, the research aimed to examine the mediating role of motivation in writing, exploring the extent to which it can be predicted by teachers' self-efficacy and, in turn, predict teachers' perceptions of using AI in writing. Specifically, the model tests motivation as a mediator. This means that self-efficacy is hypothesized to explain variance in motivation, which in turn explains variance in AI acceptance, while also allowing for a direct effect from self-efficacy to AI acceptance.

Results

In this section, first, the descriptive statistics including the maximum and minimum ratings for each of the distributed questionnaires, the mean score collected as the result of them, the Alpha ranges, and skewness and Kurtosis were measured and presented to assess the data's distributional properties and reliability. In detail, the presented statistics signified that the shared questionnaires have a high level of internal consistency. In the current study, the calculated Cronbach Alpha rates for the distributed questionnaire were rated between 0.60 to 0.82. This meant, the participants' responses to the given items inside each questionnaire were having a satisfying level of internal consistency (Table 1).

Moreover, the values of skewness for the research model varied from -0.69 to -0.30 and the values for Kurtosis ranged from 0.60 to 0.90. This means that the variables and their underlying items have a relatively normal distribution. According to the statistics, the moderate acceptable range for Skewness and Kurtosis is between -1 to +1. The given range was observed in all the extracted numbers with the exception of the Kurtosis range for AI acceptance in writing questionnaire. These analyses pertain to the distributional assumptions for the subsequent inferential tests and do not reflect the validity of the constructs. In order to make sure that the data were carefully entered to SPSS and no wrong number out of the required Likert Scale was inserted, the minimum, maximum, and mean ranges for each of the variables were measured, as illustrated in Table 1.

Table 1.

Descriptive statistics

	Min	Max	M	Alpha	Skewness	Kurtosis
Self-efficacy in Writing	1.25	4.25	3.02	0.60	-0.69	0.61
Motivation in Writing	2.00	5.00	3.74	0.79	-0.38	0.60
AI acceptance in Writing	1.53	4.73	3.22	0.82	-0.30	0.90

The relationship between the three given variables

Pearson-Product Moment Correlation coefficients were calculated in order to find out the relationship between EFL teachers' self-efficacy in writing, motivation in writing, and AI acceptance in writing. In fact, there were three correlations that could be measured based on the provided model and the existing variables. The first relationship was between EFL teachers' self-efficacy in writing and their motivation in writing (Table 2). As for the association between self-efficacy in writing and motivation in writing, the results showed a positive correlation ($r = 0.60$), which was also significant ($p < 0.01$). This indicates that there is a strong positive relationship between Iranian EFL teachers' self-efficacy and their motivation in writing. In other words, the more the teachers' rate of self-efficacy in writing, the higher their motivation rate would be in this field. Conversely, if teachers are not sufficiently motivated to write, their self-efficacy goes lower as well.

Table 2.

The results for Pearson-Product Moment Correlation between Self-efficacy in writing and motivation in writing

P-value	< 0.01
Correlation Value	0.60
Number of Participants	250

Followed by that, the correlation between the teachers' motivation in writing and AI acceptance in writing was measured (Table 3). For this hypothesis (the relationship between motivation in writing and teachers' AI acceptance), a significant but weak positive relationship was revealed ($r = 0.18$), explaining a small proportion of the variance. This suggests that while a statistically significant association exists, motivation in writing is only a modest direct predictor of AI acceptance. It is noteworthy that the p-value for this correlation coefficient was also significant ($p < 0.01$).

Table 3.

The results for Pearson-Product Moment Correlation between Motivation in writing and AI acceptance in writing

P-value	< 0.01
Correlation Value	0.18
Number of Participants	250

Finally, the relationship between self-efficacy in writing and AI acceptance in writing (the third hypothesis) was measured (Table 4). The results of the study, similar to the previous correlation between motivation and AI acceptance, presented a weak relationship between the variables. However, the value was statistically significant. It can be seen that teachers with higher self-

efficacy levels had a higher rate of positive attitude toward the use of AI in their teaching experiences ($r = 0.25$). The results for this part of the study were also significant ($p < 0.01$).

Table 4.

The results for Pearson-Product Moment Correlation between Self-efficacy in writing and AI acceptance in writing

P-value	< 0.01
Correlation Value	0.25
Number of Participants	250

Overall, as the numerical information in the Tables have indicated, all the estimates (weak or strong) were statistically significant and approved the positive relationship between all the variables in the current study.

The Estimated Model

In the next phase of the study, the collected data for each of the variables (self-efficacy in writing, motivation in writing, and AI acceptance in writing) were grouped, and uploaded in AMOS to generate the hypothesized model of the study. The major aim for generating a model was to assess the predictive power of the exogenous variables (i.e. self-efficacy in writing and motivation in writing) and uncover the extent to which they influence the endogenous variables (i.e. motivation in writing and AI acceptance in writing). Furthermore, the possible mediating power of the variables inside the model were evaluated. Followed by building up the model, SEM was conducted so as to find out whether the indices that confirm the model fit are appropriate or not (Tables 5 and 6). In other words, the model fit indices that decide the appropriateness of the model were estimated. The major model fit indices to identify the appropriateness of the models are GFI (Goodness of fit), AGFI (Adjusted Goodness of Fit), CFI (Comparative Fit Index), RMSEA (Root Mean Square Error of Approximation), SRMR (Standardized Root Mean Square Residual), and χ^2 (Chi-square).

The model fit indices presented a mixed picture. The SRMR and CFI values indicated an acceptable fit. However, the RMSEA value was above the recommended threshold of 0.08, and the GFI and AGFI values were significantly below the conventional cutoff of 0.90. Overall, these indices indicate that the hypothesized model demonstrates a poor overall fit to the data. Given this poor fit, the following interpretations of path coefficients should be considered tentative and viewed with caution. The relationships explored here warrant further validation with a model that achieves an acceptable fit. The statistical information for the absolute and relative model fit indices is presented in Tables 5 and 6.

Table 5.

Absolute model fit indices for the hypothesized model

	CMIN(χ^2)	SRMR	RMSEA
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Measurement model	3.521	0.05	0.11
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Table 6.

Relative model fit indices for the hypothesized model

	CFI	GFI	AGFI
Measurement model	0.90	0.82	0.85

It is also noteworthy that the hypothesized model was confirmed as the best model during the process of model testing. As the process of model confirmation in SEM follows, a number of alternative models were hypothesized and tested to find out whether they fit the data. Although the alternative models were fitting the data as well and were acceptable in their fit indices, the rates in the current model were significantly higher and, therefore, the current model was used as the confirmed model for the research.

Having proceeded with the model interpretation despite the mixed fit indices, we analyzed the model to find out about the possible relationship between the factors. Precisely, at this stage, the possible predictive power of factors over each other was examined. The model explained 36% of the variance in Writing Motivation ($R^2 = 0.36$) and 6% of the variance in AI Acceptance ($R^2 = 0.06$).

The results have indicated the statistically significant, though modest, relationship between self-efficacy toward writing and EFL teachers' motivation level in this respect. This meant self-efficacy toward writing in the EFL context was referred to as a significant predictor for EFL teachers' motivation in writing ($\beta = 0.15$, $p = 0.037$). It should be noted that while statistically significant, the small magnitude of this effect indicates a minimal practical impact.

In addition, another significant (though weak) path was observed between writing motivation and Teachers' use of AI in the EFL context ($\beta = 0.06$, $p = 0.021$). The result indicates that Iranian EFL teachers' motivation predicts their attitude to use AI in the writing process. However, the extremely low beta value suggests this direct influence is negligible in practical terms.

Finally, a direct path was observed from self-efficacy in writing toward AI acceptance in writing ($\beta = 0.20$, $p = 0.001$). The results for the path coefficient analysis revealed that Self-efficacy in writing significantly predicts Iranian EFL teachers' perceptions to use AI. While statistically significant, the small effect size again indicates a limited practical influence.

To test the mediating role of motivation (RQ4), the indirect effect was examined. The bootstrapping procedure revealed a significant indirect effect of self-efficacy on AI acceptance through motivation ($\beta = 0.009$, 95% CI [0.001, 0.024]). Since the confidence interval does not contain zero, the mediation effect is statistically significant. It is important to note, however, that the extremely small magnitude of this effect ($\beta = 0.009$) indicates that while the mediation is statistically detectable, its practical influence is negligible.

To conclude, the results for the designed model indicated that teachers' self-efficacy in writing acts as a significant predictor with respect to its impact on determining teachers' motivation and tendency to use AI in EFL writing. Furthermore, motivation in writing, according to the significant path coefficients and the significant indirect effect, was introduced as a significant mediator in the hypothesized model. The details for the path coefficient values and model indices are presented in Table 7 and Figure 2.

Table 7.

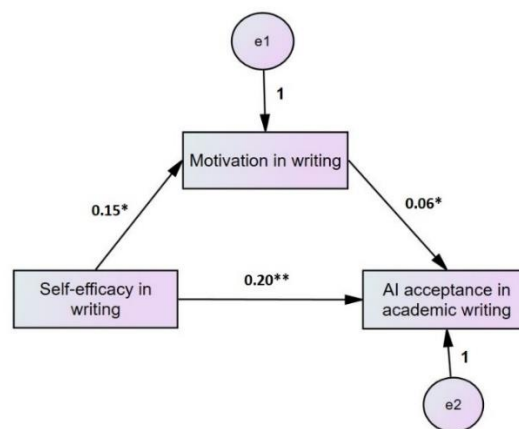
Results from testing the hypotheses using parameter estimates.

Path	Standardized β	P-value
SE in writing and writing motivation	0.15	0.037*
Writing motivation and AI in writing	0.06	0.021*
SE in Writing and AI in writing	0.20	0.001**
Indirect Effect (SE $\rightarrow$ Mot $\rightarrow$ AI)	0.009	CI [0.001, 0.024]

Finally, another path was directed from self-efficacy in writing toward AI acceptance in writing. There the results for the path coefficient analysis revealed that Self-efficacy in writing significantly predicts Iranian EFL teachers' perceptions of using AI.

Figure 2

Structural model for Self-efficacy in writing, Motivation in Writing, and AI Acceptance in Writing with Standardized Path Coefficients and R^2 Values.



Therefore, as the results of the hypothesized model have indicated, all the coefficients for the directed paths between the addressed variables were significant, meaning that the given factors

had significant predictive powers over each other or could be significantly predicted by the other variables in the model.

Discussion

The present study aimed to investigate the relationship between the writing self-efficacy of Iranian EFL teachers, their motivation to write, and their AI acceptance. The findings are provided below in relation to the research questions and existing literature.

The first research question inquired about whether there was a significant relationship between the writing self-efficacy of EFL teachers and their motivation to write. A strong and positive correlation ($r = 0.60$) was found between writing self-efficacy and motivation to write, which supports Bandura's (1997) theory of a connection between self-belief and motivation, and is consistent with the research conducted in the field of general education (e.g., Ayllón et al., 2019). In other words, teachers' confidence in their writing abilities affects the level of motivation to write for those teachers. For example, the current study corroborates the findings of Zhang and Guo (2012), who established that self-efficacy was a predictor of motivation for EFL learners; therefore, the current study extends that relationship to the teacher population, which has received less attention in similar studies. Self-efficacy is an important predictor of motivation because teachers who have confidence in their writing skills are more likely to engage with writing tasks in a positive and persistent manner. However, it is crucial to differentiate between the correlational association and the predictive effect within the model. While the correlation was strong, the path coefficient in the SEM analysis ($\beta = 0.15$) showed a statistically significant yet modest predictive effect of self-efficacy on motivation. This suggests that, although the two constructs are closely related, the direct influence of writing self-efficacy on motivation, when accounting for the model's structure, is present but limited in magnitude.

The second research question investigated whether there is a link between writing motivation and acceptance of AI. The results showed a weak, but statistically significant positive correlation ($r = 0.18$) and a very small direct path coefficient ($\beta = 0.06$) in the SEM analysis. This suggests that while a statistically significant connection exists between these factors, the direct influence of writing motivation on AI acceptance is minimal in this context. The findings of this study partially align with previous research that highlighted motivation as one of many important influences on the adoption of technology (e.g., Seong & Kim, 2024) but in contrast to the literature that found much stronger influences of motivation on technology acceptance. Perhaps this indicates that for Iranian EFL teachers, the decision to adopt AI tools involves considerations beyond their intrinsic motivation to write, such as perceived utility or institutional support (Tram & Tran-Thanh, 2024).

The third research question addressed the relationship between perceived self-efficacy in writing and the acceptance of AI technology. Using SEM, it was determined that there is a statistically significant direct prediction between self-efficacy in writing and acceptance of AI technology ($\beta = 0.20$, $p < 0.001$). For this correlation, the size of the effect is relatively small ($r = 0.25$); however, it is a meaningful effect and indicates that teachers' confidence in their ability to write has a small, but direct, effect on their propensity to use AI technology as a tool in the writing process. This adds to the existing research regarding the impact of teacher self-efficacy, as most previous research has primarily focused on teachers' self-efficacy based on teacher practices and levels of burnout (e.g., Choi & Lee, 2018; Fu et al., 2024); this study demonstrates a direct, albeit limited, relationship between self-efficacy and the adoption of technology in the writing domain.

Lastly, the fourth research question inquired if motivation acts as a mediator for the association between self-efficacy and AI acceptance. Results from the mediation analysis suggested that motivation is indeed a moderate mediator of this relationship, making this a significant contribution to the current body of knowledge about technology acceptance. The research supports a connection between self-efficacy and motivation as well as between both constructs and the use of technology, but integrates the two by demonstrating that self-efficacy affects AI acceptance through the mediating effect of motivation. This perspective adds to and extends existing theoretical models, including TAM, by introducing an important psychological mechanism, where greater self-confidence leads to increased motivation and thus a more positive attitude toward using new technologies.

Overall, findings indicate that there exists a complex interaction between teacher self-efficacy, motivation, and AI acceptance. The strong correlation between self-efficacy and motivation is indicative of a strong psychological relationship between them; whereas the relatively weak direct associations to AI acceptance suggest that although both self-efficacy and motivation are important psychological constructs, they do not constitute the only or full explanation for AI acceptance. The model accounted for a small 6% ($R^2 = 0.06$) of the variance in AI acceptance, and therefore future research will need to take into consideration additional constructs (e.g., perceived ease of use, facilitating conditions, training, prior experience, etc.) on AI acceptance (Davis, 1989; Sumakul, 2022). Future research should therefore consider these psychological constructs together with other technology acceptance constructs to create a more robust and complete model for predicting AI acceptance.

Conclusion

The primary contribution of this study is the empirical identification of motivation as a significant partial mediator between EFL teachers' writing self-efficacy and their acceptance of AI tools for academic writing. This suggests that efforts to foster teachers' adoption of educational technology should consider not only their self-efficacy but also the motivational pathways through which this confidence operates. By strengthening these foundational psychological factors, institutions can indirectly foster a more receptive attitude toward technological innovations, even though other practical factors (e.g., training, resources) are also crucial (Fereidouni & Farahian, 2024).

The current study, despite significant results, has a number of limitations. First, this study recruited a total of 250 participants from western regions of Iran. However, results from studies with greater sample sizes are more reliable and, therefore, more generalizable. Hence, further studies with higher number of participants can be conducted with the same design to reach more comprehensive results. Furthermore, the model designed for the hypothesis testing procedure in this model has only included three variables. The modest variance explained in AI acceptance (R^2) clearly indicates that other important factors are at play. Future research should therefore propose and test more comprehensive models that include other variables from technology acceptance theories, such as perceived ease of use, facilitating conditions, and prior experience with technology. Additionally, we acknowledge that the use of normality tests (e.g., Kolmogorov-Smirnov, Shapiro-Wilk) with a sample size of $N=250$ can be overly sensitive. Future confirmatory studies might employ multivariate normality assessments (e.g., Mardia's coefficient) to complement their analysis. Finally, further studies could be conducted in other cultural and educational contexts to compare the results. Finally, the current study was conducted in the Iranian

the EFL context and all the participants due to the convenient sampling procedure were selected from the EFL educational contexts located in western Iran. Further studies, therefore, could be conducted in other contexts to find out whether the achieved result is the same or different.

Conflict of interests

The authors declare that they have no conflict of interest.

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Bahar Taheri: She holds an MA in TEFL from Islamic Azad University, Kermanshah Branch. Her research interests include second language writing and Technology-Enhanced Language Learning (TELL).

Majid Farahian: is an Associate Professor of Applied Linguistics at Islamic Azad University, Kermanshah, Iran. His main research interests include second language (L2) writing and computer-assisted language learning (CALL), with a particular focus on artificial intelligence (AI) applications in L2 writing as well as metacognition and reflective thinking in English language teaching (ELT). He has published numerous articles in both local and international journals like *Thinking Skills and Creativity*, *The Journal of Psycholinguistic Research*, *Research and Practice in Technology Enhanced Learning*, and *Technology Assisted Language Education (TALE)*.