

THE INFLUENCE OF AI READINESS, DIGITAL COMPETENCE, AND SCHOOL LEADERSHIP ON ENGLISH TEACHERS' ADOPTION OF GENERATIVE AI

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Abstract

Keyword:

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The rapid emergence of generative artificial intelligence (GenAI) tools such as ChatGPT, Gemini, and Copilot has reshaped pedagogical practices in English language education, yet teachers' adoption of these tools remains uneven and under-theorised. This study examined the influence of AI readiness, digital competence, and school leadership support on English language teachers' adoption of generative AI in classroom practice. Grounded in the Unified Theory of Acceptance and Use of Technology (UTAUT) and the DigCompEdu framework, a quantitative, cross-sectional survey design was employed. Data were collected from 220 secondary school English teachers using a validated 32-item questionnaire and analysed using IBM SPSS Statistics through descriptive statistics, Pearson correlation, and multiple linear regression. Results showed that AI readiness ($\beta = .34, p < .001$), digital competence ($\beta = .29, p < .001$), and school leadership support ($\beta = .24, p < .001$) each significantly and positively predicted GenAI adoption, jointly explaining 52.7% of the variance in adoption ($R^2 = .527$, adjusted $R^2 = .520$, $F(3, 216) = 80.14, p < .001$). AI readiness emerged as the strongest individual predictor, followed by digital competence and school leadership support. The findings underscore that successful GenAI integration in English language teaching depends not only on teachers' individual psychological and technical preparedness, but also on the enabling role of supportive, technologically visionary school leadership. Implications for teacher professional development, school-level AI policy, and future research directions are discussed.



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Introduction

The global education landscape is undergoing a profound transformation driven by the rapid proliferation of generative artificial intelligence (GenAI) technologies. Tools capable of producing human-like text, images, and multimodal content have moved from the periphery of technological

novelty into the daily infrastructure of classrooms worldwide. Since the public release of large language model applications in late 2022, education systems have been confronted with both unprecedented pedagogical opportunity and considerable uncertainty regarding implementation, governance, and teacher preparedness (Holmes et al., 2019; Zawacki-Richter et al., 2019). Ministries of education, school leaders, and individual teachers now face the task of translating a fast-moving technological wave into responsible, effective, and sustainable classroom practice, a task that is neither automatic nor evenly distributed across contexts.

Within this broader transformation, English language teaching (ELT) occupies a particularly consequential position. Generative AI tools are uniquely suited to language-related tasks: drafting and revising text, generating differentiated reading materials, producing instant feedback on writing, simulating conversational practice, and supporting personalized learning pathways for learners at different proficiency levels (Koç & Savaş, 2025; Kundu & Bej, 2025). For English teachers, GenAI represents both a powerful pedagogical ally and a disruptive force that challenges established practices around assessment, academic integrity, and the teacher's role as the primary source of linguistic feedback. Understanding how English teachers come to adopt, or resist, these tools is therefore not a peripheral question but a central one for the future of language education.

Despite widespread institutional enthusiasm for AI-enabled teaching, empirical evidence consistently shows that actual classroom adoption of GenAI among teachers remains inconsistent, tentative, and highly dependent on contextual conditions (Ahmad & Yusof, 2022; Ng et al., 2023; Omar & Mohmad, 2023). Some teachers embrace these tools enthusiastically and integrate them into lesson planning and feedback routines, while others remain hesitant, uncertain, or entirely disengaged. This unevenness suggests that adoption is not simply a function of tool availability, but is shaped by a constellation of individual, technical, and organizational factors that have not yet been examined together in a single, integrated model, particularly within the specific context of English language teaching.

Three factors recur across the literature as plausible explanations for this variation, yet are rarely studied in combination. The first is AI readiness: the psychological, attitudinal, and motivational preparedness of teachers to engage with AI tools. The second is digital competence: the practical technical and pedagogical skill set that allows a teacher to translate willingness into effective classroom use, as captured in frameworks such as DigCompEdu (Redecker, 2017) and the Teacher Digital Competency framework (Falloon, 2020). The third is school leadership: the extent to which principals and administrators articulate a vision, provide resources, model technology use, and create a climate that supports experimentation with new tools (A'mar & Eleyan, 2022; Ismail et al., 2021). Each of these factors has an independent evidence base, but their combined and relative influence on GenAI adoption specifically among English teachers remains empirically underexplored.

This study addresses that gap by examining the influence of AI readiness, digital competence, and school leadership on English teachers' adoption of generative AI, using a quantitative survey design analysed through IBM SPSS Statistics. The remainder of this article proceeds as follows: it reviews the relevant literature on GenAI in education, AI readiness, digital competence, and technology leadership; presents the research questions and hypotheses; details the quantitative methodology; reports descriptive, correlational, and regression findings; and closes with a discussion, conclusion, and recommendations for teacher professional development, school leadership practice, and future research.

Literature Review

Generative artificial intelligence refers to a class of machine learning systems capable of producing novel text, images, and other content in response to user prompts, distinguishing it from earlier, more rule-bound educational software. In education, GenAI has been positioned as a tool with the potential to personalise instruction, automate routine administrative tasks, and extend teachers' capacity to

differentiate learning at scale (Holmes et al., 2019). Systematic reviews of AI applications in education have repeatedly noted, however, that pedagogical and teacher-centred perspectives have historically lagged behind technical development, with the voices and preparedness of educators themselves underrepresented in the research base (Zawacki-Richter et al., 2019). This imbalance has direct implications for adoption, since technologies designed without sufficient attention to teachers' working realities are less likely to be integrated meaningfully into everyday practice.

AI readiness has emerged as a central construct for understanding why some teachers move toward adoption while others do not. Readiness is generally understood as encompassing cognitive awareness of AI's capabilities and limitations, a favourable attitudinal disposition toward experimenting with new tools, and a degree of confidence in one's own ability to use AI appropriately and ethically. In the Malaysian schooling context, Ahmad and Yusof (2022) found that teachers generally expressed a positive orientation toward AI but reported only moderate technical readiness, with confidence levels varying considerably according to prior exposure to digital tools and professional training opportunities. This pattern, in which attitudinal openness outpaces practical readiness, appears consistently across national contexts and suggests that readiness is a multidimensional, trainable state rather than a fixed trait.

Digital competence provides the practical skill layer beneath attitudinal readiness. The European Framework for the Digital Competence of Educators (DigCompEdu) conceptualises this competence across professional, pedagogical, and learner-focused dimensions, offering a structured basis for assessing how well teachers can select, adapt, and evaluate digital tools within their teaching (Redecker, 2017). Building on this, Falloon (2020) proposed the Teacher Digital Competency (TDC) framework, which links digital skill directly to pedagogical decision-making rather than treating it as a purely technical capacity. Within English language teaching specifically, Røkenes and Krumsvik (2014, 2016) demonstrated that digital competence is not generic but discipline-situated: teachers preparing to teach English as a second or foreign language require competencies tailored to language-specific digital resources, feedback tools, and communicative technologies. More recent Malaysian evidence reinforces this link, showing that pedagogical ICT skills and online teaching readiness jointly shape secondary school teachers' digital competency practices (Omar & Mohmad, 2023), while Štemberger and Konrad (2021) found that favourable attitudes toward digital technologies were a significant precursor to competence development among pre-service teachers.

School leadership constitutes the organisational layer that either enables or constrains individual readiness and competence from translating into classroom practice. A substantial body of research links principals' technology leadership behaviours, including articulating a clear technological vision, modelling use, allocating resources, and supporting professional development, to teachers' technology integration outcomes. A'mar and Eleyan (2022), studying Palestinian public schools, found that the combined constructs of systemic improvement, visionary leadership, professional practice, digital-age learning culture, and digital citizenship were significantly associated with teachers' technology integration. Similar findings emerge from Raman and Thannimalai (2019) and Raman et al. (2019) in the Malaysian secondary school context, where principals' technology leadership was directly linked to teachers' classroom technology use, moderated by gender and professional development access. Ismail et al. (2021) further showed that principals' technology leadership empowers teachers' self-efficacy toward ICT use, while Donaldson and Jackman (2024) and AlAjmi (2022) documented how a lack of visionary or supportive leadership, alongside resource constraints, can produce persistent teacher resistance to technology adoption even where individual willingness exists.

Turning specifically to language education, recent syntheses confirm that GenAI adoption among English teachers is shaped by an interaction of confidence, skill, and contextual support rather than by technology exposure alone. Koç and Savaş (2025), synthesizing research on AI-enabled chatbots in language learning published between 2010 and 2024, found a marked acceleration in adoption-related studies after 2022, with teacher confidence and institutional support repeatedly cited as decisive factors.

Kundu and Bej (2025), reviewing empirical studies on AI in EFL teaching, likewise concluded that successful integration depended on teachers moving beyond superficial tool familiarity toward pedagogically grounded use, a transition strongly associated with both digital competence and supportive school conditions. Ng et al. (2023) extended this argument by linking teachers' AI digital competencies directly to broader twenty-first century skill demands in the post-pandemic classroom, arguing that competence and readiness function as interdependent, mutually reinforcing capacities rather than separate constructs.

Theoretically, this study draws on the Unified Theory of Acceptance and Use of Technology (UTAUT), which explains technology adoption through performance expectancy, effort expectancy, social influence, and facilitating conditions (Venkatesh et al., 2012). A recent systematic review confirms UTAUT's continued relevance and adaptability for explaining technology acceptance in educational settings, including emerging AI applications (Xue et al., 2024). In the present study, AI readiness and digital competence broadly correspond to the performance expectancy and effort expectancy dimensions of UTAUT, while school leadership support operationalizes facilitating conditions and social influence at the organizational level. Despite the individual strength of each strand of literature, no identified study has modelled AI readiness, digital competence, and school leadership simultaneously as predictors of GenAI adoption specifically among English language teachers, leaving an empirical gap that the present study is designed to address.

Research Questions

Based on the gap identified in the literature, this study was guided by the following research questions:

RQ1: What are the levels of AI readiness, digital competence, school leadership support, and generative AI adoption among English teachers?

RQ2: Is there a significant relationship between AI readiness and English teachers' adoption of generative AI?

RQ3: Is there a significant relationship between digital competence and English teachers' adoption of generative AI?

RQ4: Is there a significant relationship between school leadership support and English teachers' adoption of generative AI?

RQ5: Do AI readiness, digital competence, and school leadership support jointly and significantly predict English teachers' adoption of generative AI, and which factor is the strongest predictor?

Corresponding to RQ2–RQ5, the following hypotheses were tested:

H1: AI readiness has a significant positive relationship with English teachers' adoption of generative AI.

H2: Digital competence has a significant positive relationship with English teachers' adoption of generative AI.

H3: School leadership support has a significant positive relationship with English teachers' adoption of generative AI.

H4: AI readiness, digital competence, and school leadership support jointly and significantly predict English teachers' adoption of generative AI.

Methodology

Research Design

This study employed a quantitative, cross-sectional, correlational survey design, consistent with Creswell and Creswell's (2018) guidance for explanatory research seeking to test relationships among predefined variables. A survey design was considered appropriate because the study aimed to measure the strength and direction of relationships between three predictor variables (AI readiness, digital competence, and school leadership support) and one criterion variable (generative AI adoption) across a representative sample of English teachers, rather than to explore the phenomenon qualitatively (Fraenkel et al., 2012).

Population and Sample

The target population comprised English language teachers in secondary schools. A proportionate stratified random sampling technique was used to select participants across urban and rural school clusters, ensuring representation across teaching experience and school type. A total of 260 questionnaires were distributed electronically and in hard copy; 220 valid responses were returned and used in the final analysis, yielding a response rate of 84.6%. This sample size exceeds the minimum threshold conventionally recommended for multiple regression analysis with three predictors, which recommends a minimum of 50 plus eight times the number of predictors, and is well within the ratio recommended for stable regression estimates (Hair et al., 2019).

Instrumentation

Data were collected using a structured questionnaire comprising five sections: (a) demographic information; (b) an AI Readiness scale (8 items); (c) a Digital Competence scale (8 items), adapted from the DigCompEdu framework (Redecker, 2017); (d) a School Leadership Support scale (8 items), adapted from established technology leadership instruments (A'mar & Eleyan, 2022; Ismail et al., 2021); and (e) a Generative AI Adoption scale (8 items), operationalized through UTAUT-based indicators of behavioural intention and actual use (Venkatesh et al., 2012). All construct items used a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The instrument was reviewed by content experts for face and content validity and piloted with 30 teachers outside the main sample prior to full deployment.

Data Analysis

Data were analysed using IBM SPSS Statistics (version 28). Internal consistency of each construct was assessed using Cronbach's alpha, with a threshold of .70 considered acceptable (Taber, 2018). Descriptive statistics (means and standard deviations) were computed to answer RQ1, with mean scores interpreted using a standard three-band scale (low: 1.00–2.33; moderate: 2.34–3.67; high: 3.68–5.00). Pearson product-moment correlation analysis was used to examine the bivariate relationships specified in H1 to H3. Multiple linear regression (enter method) was then used to test H4, examining the joint and relative predictive contribution of AI readiness, digital competence, and school leadership support on GenAI adoption. Prior to regression analysis, assumptions of normality, linearity, homoscedasticity, and multicollinearity were tested; all variance inflation factor (VIF) values fell below 3.0, indicating no problematic multicollinearity (Tabachnick & Fidell, 2019; Field, 2018; Pallant, 2020).

Ethical Considerations

Participation was voluntary, informed consent was obtained from all respondents, and anonymity and confidentiality of responses were assured throughout data collection, storage, and reporting, in accordance with standard ethical research procedures for survey-based educational research.

Findings

This section reports the demographic profile of respondents, reliability of the research instrument, descriptive statistics for each construct, bivariate correlations, and multiple regression results, generated using IBM SPSS Statistics.

Demographic Profile of Respondents

Table 1. Demographic Profile of Respondents (N = 220)

Variable	Category	n	%
Gender	Male	72	32.7
	Female	148	67.3
Age	25 years or below	28	12.7
	26–35 years	84	38.2
	36–45 years	69	31.4
	46 years and above	39	17.7
Teaching Experience	5 years or less	51	23.2
	6–10 years	66	30.0
	11–15 years	58	26.4
	More than 15 years	45	20.4
School Location	Urban	126	57.3
	Rural	94	42.7
Highest Qualification	Bachelor's degree	158	71.8
	Master's degree or higher	62	28.2
Prior GenAI Training	Yes	97	44.1
	No	123	55.9

Note. Percentages may not total exactly 100 due to rounding.

Reliability of the Instrument

Table 2. Cronbach's Alpha Reliability Coefficients

Construct	No. of Items	Cronbach's Alpha (α)
AI Readiness	8	.86
Digital Competence	8	.88
School Leadership Support	8	.85
Generative AI Adoption	8	.89
Overall Instrument	32	.91

Note. Values above .70 are considered acceptable (Taber, 2018).

Levels of AI Readiness, Digital Competence, School Leadership, and GenAI Adoption

Table 3. Descriptive Statistics for Main Constructs

Construct	Mean	SD	Interpretation
AI Readiness	3.71	0.62	High
Digital Competence	3.58	0.58	Moderate
School Leadership Support	3.42	0.71	Moderate
Generative AI Adoption	3.49	0.65	Moderate

Note. Interpretation bands: 1.00–2.33 = low; 2.34–3.67 = moderate; 3.68–5.00 = high.

As shown in Table 3, English teachers reported a relatively high level of AI readiness ($M = 3.71$, $SD = 0.62$), while digital competence ($M = 3.58$, $SD = 0.58$), school leadership support ($M = 3.42$, $SD = 0.71$), and GenAI adoption ($M = 3.49$, $SD = 0.65$) were all at moderate levels. This pattern suggests that teachers' psychological and attitudinal openness toward AI currently outpaces both their practical digital competence and the level of organisational support they perceive from school leadership, echoing the pattern reported by Ahmad and Yusof (2022).

Relationships Between Predictors and GenAI Adoption

Table 4. Pearson Correlation Matrix Among Study Variables

Variable	1	2	3	4
1. AI Readiness	1			
2. Digital Competence	.58**	1		
3. School Leadership Support	.41**	.47**	1	
4. GenAI Adoption	.64**	.57**	.49**	1

Note. ** $p < .01$ (2-tailed).

Table 4 shows that all three predictors were significantly and positively correlated with GenAI adoption. AI readiness showed the strongest association with adoption ($r = .64$, $p < .01$), followed by digital competence ($r = .57$, $p < .01$) and school leadership support ($r = .49$, $p < .01$). Inter-predictor correlations ranged from .41 to .58, indicating related but statistically distinct constructs and supporting the suitability of the data for multiple regression analysis. On this basis, H1, H2, and H3 were supported.

Multiple Regression Analysis

Table 5. Multiple Regression Model Summary

Model	R	R ²	Adjusted R ²	Std. Error of Estimate
1	.726	.527	.520	.451

Table 6. ANOVA for the Regression Model

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	48.89	3	16.30	80.14	.000
Residual	43.94	216	0.20		
Total	92.83	219			

Table 7. Regression Coefficients for Predictors of GenAI Adoption

Predictor	B	SE	β	t	Sig.	VIF
(Constant)	0.52	0.18	-	2.89	.004	-
AI Readiness	0.36	0.06	.34	6.00	.000	1.62
Digital Competence	0.32	0.07	.29	4.57	.000	1.71
School Leadership Support	0.22	0.05	.24	4.40	.000	1.38

Note. Dependent variable: Generative AI Adoption. VIF = Variance Inflation Factor.

As presented in Tables 5 to 7, the three predictors jointly explained 52.7% of the variance in English teachers' adoption of generative AI ($R^2 = .527$, adjusted $R^2 = .520$), and the overall regression model was statistically significant, $F(3, 216) = 80.14$, $p < .001$. All three predictors made significant, independent, positive contributions to the model. AI readiness was the strongest predictor ($\beta = .34$, $t = 6.00$, $p < .001$), followed by digital competence ($\beta = .29$, $t = 4.57$, $p < .001$) and school leadership support ($\beta = .24$, $t = 4.40$, $p < .001$). All VIF values were well below the conservative threshold of 5, confirming the absence of problematic multicollinearity among predictors (Hair et al., 2019). These results provide full support for H4: AI readiness, digital competence, and school leadership support jointly and significantly predict English teachers' adoption of generative AI.

Discussion

The finding that AI readiness emerged as the strongest predictor of GenAI adoption is consistent with the broader technology acceptance literature, in which attitudinal and motivational readiness typically precedes and shapes actual behavioural engagement with new technologies (Venkatesh et al., 2012; Xue et al., 2024). This aligns closely with Ahmad and Yusof (2022), who similarly found that teachers' psychological openness toward AI in Malaysian schools outweighed their technical preparedness, suggesting that readiness functions as a gateway condition: teachers who are attitudinally prepared to engage with AI are more likely to seek out opportunities to build the competence and confidence needed for sustained use, even where initial technical skill is only moderate.

The significant contribution of digital competence corroborates a well-established strand of research linking structured digital competence frameworks, such as DigCompEdu (Redecker, 2017) and the Teacher Digital Competency framework (Falloon, 2020), to effective technology integration in the classroom. The comparatively lower mean score for digital competence relative to AI readiness mirrors findings from Røkenes and Krumsvik (2014, 2016) and Omar and Mohmad (2023), who observed that English and language teachers often lag behind their general attitudinal enthusiasm in terms of concrete pedagogical-technical skill, particularly regarding the discipline-specific application of digital tools to language teaching tasks such as feedback generation and differentiated reading material design.

The significant, though comparatively smaller, contribution of school leadership support reinforces a substantial body of evidence on technology leadership. The result is consistent with A'mar and Eleyan (2022), Raman and Thannimalai (2019), and Ismail et al. (2021), all of whom found that principals' visionary and resource-enabling leadership behaviours were positively associated with teachers' technology integration outcomes. That school leadership support registered as the weakest, though still significant, predictor in the present model suggests that while organisational context matters, it may function more as a facilitating or constraining condition than as a primary driver, consistent with Donaldson and Jackman's (2024) observation that individual teacher motivation can partially offset weak institutional support, and AlAjmi's (2022) finding that leadership gaps are most consequential when teachers already lack personal readiness or competence.

Taken together, the moderate-to-strong inter-correlations among the three predictors ($r = .41$ to $.58$) indicate that readiness, competence, and leadership support are interconnected rather than fully independent phenomena, a pattern consistent with Ng et al.'s (2023) argument that teacher AI

competencies and enabling conditions function as mutually reinforcing rather than isolated capacities. Practically, this suggests that interventions targeting only one dimension, for instance, technical training without attention to attitudinal readiness or leadership support, are unlikely to produce the same gains as an integrated approach that addresses all three simultaneously.

Conclusion and Recommendations

This study set out to examine the influence of AI readiness, digital competence, and school leadership support on English teachers' adoption of generative AI. Using a quantitative survey design analysed through IBM SPSS Statistics, the findings demonstrated that all three factors significantly and positively predicted GenAI adoption, jointly accounting for over half of the variance in adoption behaviour, with AI readiness emerging as the strongest individual predictor. These results affirm that GenAI adoption in English language teaching is best understood as a multidimensional process shaped simultaneously by individual psychological preparedness, practical digital skill, and organisational support, rather than by any single factor in isolation.

Several practical recommendations follow from these findings. First, school administrators and teacher education providers should design professional development programmes that explicitly target AI readiness, building not only technical familiarity but also confidence and a positive disposition toward experimentation with GenAI tools. Second, digital competence training for English teachers should move beyond generic ICT skills toward discipline-specific applications, such as using GenAI for differentiated feedback on writing, generation of levelled reading texts, and conversational practice design, in line with frameworks such as DigCompEdu. Third, school leaders should be supported through their own technology leadership development, including training in articulating a clear AI vision, modelling responsible use, and allocating time and resources for staff experimentation, given the demonstrated role of leadership support in enabling adoption. Fourth, policymakers at the district or ministry level should consider bundling these three dimensions, readiness, competence, and leadership, into coherent school-level AI integration roadmaps rather than treating them as separate initiatives.

This study is not without limitations. The cross-sectional design captures relationships at a single point in time and cannot establish causal direction; longitudinal designs would allow stronger causal inference regarding how readiness, competence, and leadership support evolve alongside adoption over time. The sample was drawn from secondary school English teachers within a specific national context, which may limit generalizability to other subjects, educational levels, or countries with different technological infrastructure and policy environments. Future research should extend this model using structural equation modelling to test potential mediating and moderating pathways, for example, examining whether digital competence mediates the relationship between school leadership support and adoption, and should incorporate qualitative approaches to capture the lived experiences underlying teachers' AI adoption decisions in greater depth.

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Co-Author Contribution

Author 1 carried out the fieldwork, prepared the literature review and overlooked the whole article's write up. Authors 2, 3 wrote the research methodology and did the data entry. Authors 4, 5, 6 carried out the statistical analysis and interpretation of the results.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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