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Artificial Intelligence Acceptance of High School English Teachers and Its Influencing Factors

—Mixed Research Based on the UNESCO Framework for Teachers' AI Competence

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Abstract

Based on the "Teacher AI Competence Framework" newly released by UNESCO in 2024, this study uses a mixed research method combining questionnaire survey and in-depth interview to explore the acceptance of the application of AI in high school English teaching and its influencing factors among 129 high school English teachers who participated in a teacher training organized by a district in Zhejiang Province. The results show that the overall acceptance of AI among high school English teachers is above the average level, but there are structural differences among the five dimensions of the AI Competency Framework. This study provides a new theoretical perspective for the mixed study of language teachers' technology acceptance, and provides a reference for relevant policy formulation, curriculum reform and teacher training.

Keywords

High School English Teachers, Acceptance of Artificial Intelligence, Influencing Factors, Mixed Research

1. Introduction

The Guidelines on Comprehensively Deepening the Reform of Teacher Team Building in the New Era issued by the State Council (2018) emphasizes that teachers should proactively adapt to emerging technological transformations, particularly informatization and artificial intelligence (AI), to effectively implement educational practices. The Strengthening Teachers in the New Era of Basic Education Initiative jointly released by the Ministry of Education and seven other ministries further underscores the necessity of advancing pilot measures for AI-as-

sisted teacher development and exploring the integration of AI technologies into all phases and aspects of educational instruction and administration (Ministry of Education, 2022). AI technologies empower educators by providing sufficient temporal and cognitive resources for systematic analysis of student learning trajectories, thereby enabling "precision-enhanced instructional efficiency" (Xin, 2018). Additionally, AI systems can deliver personalized resources and pathways tailored to individual teacher profiles, elevating the "self-adaptive" capacity of professional development (Peng & Wu, 2024). However, educators in the AI era concurrently face novel challenges. Teachers must transition from traditional knowledge transmitters to learning facilitators, rapidly adapting to AI-driven pedagogical paradigms and assuming innovative roles in technology-mediated teaching-learning ecosystems (Wei & He, 2020). This transformation necessitates teachers to cultivate forward-looking interdisciplinary perspectives, foster creative learning leadership, and develop competencies in intelligent technology-enabled pedagogical innovation and human-machine collaborative teaching (Feng et al., 2024).

The application of AI technologies in foreign language education has become an irreversible trend, thereby generating increased research demands in this domain. For instance, Ma (2024) revealed that pre-service English teachers exhibit cautious but optimism toward AI integration in future instructional practices, maintaining measured openness to its potential educational value. Chen (2022) identified through the Unified Theory of Acceptance and Use of Technology (UTAUT) framework that among four core determinants, performance expectancy and facilitating conditions significantly positively influence English teachers' behavioral intentions to adopt AI technologies in foreign language instruction, whereas effort expectancy demonstrates a notable negative correlation. However, existing scholarship predominantly focuses on higher education faculty and pre-service teachers, predominantly employing the UTAUT model as the conceptual scaffold.

As pivotal facilitators in students' critical phase of English acquisition, senior high school English teachers' AI acceptance substantially impacts learners' language learning motivation and the evolutionary trajectory of AI-education convergence (Son, 2018). Anchored in UNESCO's (UNESCO, 2024) AI Competency Framework for Teachers, this study aims to systematically investigate AI acceptance levels among senior high school English teachers and their determinants, ultimately proposing evidence-based enhancement strategies.

2. Connotative Interpretation of the AI Competency Framework for Teachers

The AI Competency Framework for Teachers (hereafter referred to as the Competency Framework; Miao & Holmes, 2023) systematically categorizes teachers' AI competencies into five dimensions: Artificial intelligence concept, Ethics of artificial intelligence, Basic knowledge and application skills of artificial intelligence,

AI integrated teaching method, and AI supports teacher development, which collectively define educators' AI values, knowledge, technical proficiencies, and practical implementation capacities. The framework further elucidates these competencies through three progressive mastery levels: acquisition, deepening, and creation.

In the AI-driven educational paradigm, Artificial Intelligence concept constitutes a methodological approach that prioritizes critical ethical and practical principles to regulate and guide stakeholders' practices throughout AI systems' operational lifecycle (Miao, 2024). Advancing this philosophy facilitates the pursuit of human well-being and ensures AI development aligns with the trajectory of human civilization advancement (Zhang, 2024).

Ethics of artificial intelligence refers to the universal ethical principles and behavioral norms governing intelligent agents (both human and artificial intelligence) during the development, deployment, and utilization of AI technologies (UNESCO, 2024). Empirical studies by Bai and Yu (2023) demonstrate that educational AI ethics primarily encompasses individual privacy protection, prevention of data misuse, and cultivation of critical awareness regarding AI's technological implications. Teachers' ethical competency in AI significantly correlates with instructional quality enhancement (Wang et al., 2019).

Basic knowledge and application skills of artificial intelligence emphasize teachers' dual requirement to comprehend conceptual AI knowledge and operationalize it within pedagogical contexts, particularly in establishing "student-centered, AI-assisted" learning environments (UNESCO, 2024). Miao (2024) in interpreting UNESCO's framework, further delineates essential competencies including: 1) evaluating educational applicability of AI tools through first-principles analysis, and 2) proficiently operating vetted AI systems within regulated educational ecosystems.

AI integrated teaching method delineates a structured competency set for purposeful AI integration into teaching methodologies, encompassing abilities to validate, select, and synergistically combine AI tools with pedagogical strategies to enhance curriculum design, instructional delivery, learning assessment, and socio-emotional development (UNESCO, 2024). Pioneering work by Liu et al. (2020) on educational robot-mediated transdisciplinary teaching models exemplifies this integration, establishing theoretical foundations for human-AI co-teaching paradigms.

AI supports teacher development outlines emerging competencies enabling teachers to leverage AI for lifelong learning and collaborative growth (UNESCO, 2024). Brandão et al. (2024) investigate AI's transformative impact on Teacher Professional Development (TPD), identifying TPD as the critical catalyst for adopting emerging technologies and proposing ethical AI guidance frameworks for student instruction.

Guided by UNESCO's (UNESCO, 2024) AI Competency Framework for Teachers, this study employs a mixed-methods approach integrating quantitative and qualitative research to comprehensively examine senior high school English

teachers' AI acceptance dynamics.

3. Research Design

3.1. Research Questions

This study focuses on three primary research inquiries: 1) What is the acceptance level of senior high school English teachers regarding AI technology integration in foreign language instruction? 2). What determinants influence senior high school English teachers' acceptance of AI technology in foreign language pedagogy? 3). What actionable pathways can enhance AI acceptance among these educators?

The first two questions investigate participants' cognitive perceptions and affective attitudes toward AI implementation in teaching contexts, along with their influencing factors. The third question proposes evidence-based optimization strategies derived from quantitative surveys and qualitative interviews.

3.2. Research Participants

The study cohort comprises 129 senior high school English teachers participating in a district-level professional development program in Zhejiang Province, China (demographic details in Table 1). The selection rationale primarily stems from the district's representative educational ecosystem, high-density distribution of secondary schools, abundant teacher resources with advanced professional qualifications, superior high school education benchmarks within Zhejiang Province and concentration of elite high schools with optimized educational resource allocation and instructional quality. This sampling strategy ensures access to a population exhibiting typical characteristics of China's developed coastal education systems, while maintaining research relevance to AI integration in resource-advantaged pedagogical environments.

Table 1. Statistics of sample distribution information.

Variate	Options	Numbers	Percentage (%)
Sex	Male	24	18.6
	Female	105	81.4
Age	Age 30 and under	9	6.98
	Age 30 - 39	29	22.48
	Age 40 - 49	66	51.16
	Age 50 and above	25	19.38
Teaching Age	0 - 5 years	8	6.2
	6 - 10 years	6	4.65
	11 - 15 years	23	17.83
	16 - 20 years	30	23.26
	20 years and above	62	48.06

Continued

School Type	Provincial level	21	16.28
	City level	19	14.73
	District level	75	58.14
	Counties and towns	8	6.2
	Rural area	6	4.65
Education Background	Undergraduate	108	83.72
	Master degree or above	21	16.28
Accountant	Senior teacher	45	34.88
	The first-grade teacher	63	48.84
	The second-grade teacher	19	14.73
	The third-grade teacher	2	1.55

3.3. Research Methodology

This study employs a mixed-methods research design integrating quantitative surveys and qualitative interviews to ensure methodological triangulation and enhance the robustness of findings. The questionnaire was structured based on the AI Competency Framework for Teachers (UNESCO, 2024), which delineates five dimensions of AI competencies and three progressive proficiency levels (Acquisition, Deepening, and Creation). The scale adopts a 5-point Likert-type scoring system, with responses ranging from 1 = Strongly Disagree to 5 = Strongly Agree. Higher composite scores indicate greater teacher acceptance of AI technologies. Internal consistency was assessed using Cronbach's α coefficient (details in **Table 2**), yielding a value of 0.986, exceeding the threshold of 0.7 for high reliability in social sciences. The Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy was 0.935 ($p < 0.01$), confirming the dataset's suitability for factor analysis. Principal component analysis extracted three latent factors, cumulatively explaining 89.188% of the total variance, thereby demonstrating robust construct validity.

Table 2. Questionnaire dimension and question structure.

Dimension	Items	Cronbach. α
Artificial intelligence concept	12	0.984
Ethics of artificial intelligence	8	0.982
Basic knowledge and application skills of artificial intelligence	5	0.983
AI integrated teaching method	9	0.989
AI supports teacher development	8	0.991

The interview protocol was primarily adapted from the study conducted by Pynoo et al. (2011), encompassing three core components: 1) participants' demographic information; 2) their perceptions of and suggestions regarding artificial intelligence; and 3) self-assessment scores quantifying individual AI acceptance

levels. This tripartite framework was designed to systematically investigate high school English teachers' attitudes toward AI through a multi-dimensional analytical lens, incorporating hierarchical examination across different educational strata, multi-dimensional assessment of pedagogical implications, and comprehensive integration of diverse professional perspectives. The methodological design specifically facilitates an evidence-based exploration of educators' cognitive, affective, and behavioral orientations in the context of AI integration within secondary English education.

4. Data Collection and Analysis

During the training period, research assistants distributed the questionnaire via Wenjuanxing (a professional online survey platform) and collected responses through an online completion format. The acquired data were imported into SPSS 25.0 for statistical analysis. Firstly, reliability and validity tests were conducted to assess the psychometric properties of the questionnaire. Subsequently, descriptive statistical analyses were performed to evaluate the overall acceptance of artificial intelligence (AI) among high school teachers, including calculations of means, variances, and standard deviations. An independent samples t-test was employed to examine gender-based differences in digital literacy. Finally, one-way analysis of variance (ANOVA) was utilized to assess the effects of teaching experience, school type, educational background, and professional titles on AI acceptance levels, with post hoc tests (e.g., Tukey's HSD) applied to identify specific sources of variance

For the interview component, participants were selected based on gender, teaching experience, and school location. The final sample comprised three male and three female teachers, including two from rural schools, two from district-level high schools, and two from municipal-level high schools. All six interviewees had 11 - 15 years of teaching experience. Each semi-structured interview lasted 30 - 40 minutes, audio-recorded with consent, and transcribed verbatim. The transcripts were analyzed using Nvivo 12 to identify and categorize recurring themes, ensuring thematic distinctiveness through iterative coding and categorization. To enhance credibility, the derived themes were validated via member checking with participants.

5. Research Findings and Discussion

1) Analysis of AI acceptance among high school English teachers and its influencing factors

Statistical analysis of the questionnaire data using SPSS revealed the overall status of artificial intelligence (AI) acceptance among high school English teachers. Key influencing factors were further explored through one-way analysis of variance (ANOVA) and independent samples t-tests.

a) Overall assessment of AI acceptance

The general level of AI acceptance among high school English teachers was

moderately high. As shown in Table 3, descriptive statistics indicated that participants' AI acceptance scores (mean = 4.01, SD = 1.06) followed a negatively skewed distribution, reflecting a collective inclination toward above-average acceptance. Among the five subdimensions, "human-centric AI philosophy" achieved the highest mean score (4.17), suggesting strong alignment with and endorsement of ethical AI principles. Conversely, "foundational AI knowledge and skills" yielded the lowest mean score (3.94), highlighting potential barriers to practical implementation and insufficient mastery of AI technologies in pedagogical contexts (see Table 3).

Table 3. Overview of AI acceptance of high school English teachers (N = 129).

Dimension	Mean value	Standard deviation
Artificial intelligence concept	4.17	1.02
Ethics of artificial intelligence	3.97	1.11
Basic knowledge and application skills of artificial intelligence	3.94	1.08
AI integrated teaching method	3.96	1.05
AI supports teacher development	3.99	1.04

Descriptive statistical analyses revealed that high school English teachers' current acceptance of artificial intelligence (AI) resides at a moderately high level, with a mean score of 4.01 (SD = 1.06) on a 5-point scale. While these educators generally hold positive attitudes toward AI in the evolving educational landscape, structural disparities persist across the five dimensions of the AI Competency Framework. On one hand, the highest scores were observed in the human-centric AI philosophy domain, indicating robust conceptual alignment with ethical AI principles and a natural propensity to integrate AI tools into pedagogical practices. On the other hand, the lowest scores emerged in foundational AI knowledge and applied technical skills, suggesting that despite favorable attitudinal dispositions, practical implementation remains constrained by multifaceted barriers. These include intrinsic factors (e.g., limited cognitive mastery, skill gaps, and professional identity conflicts) and extrinsic challenges (e.g., insufficient policy support, institutional management inefficiencies, inadequate training programs, and unresolved ethical and safety considerations). Consequently, addressing these systemic limitations to enhance AI acceptance represents both a critical priority and a significant challenge in future educational transformation efforts.

b) Analysis of gender differences in AI acceptance among high school English teachers

As illustrated in Table 4, an independent samples t-test was conducted to examine gender-based differences in high school English teachers' AI acceptance across five dimensions. The results revealed no statistically significant differences between male and female teachers in any of the subscales ($p > 0.05$ for all dimensions), indicating that gender does not exert a measurable influence on AI acceptance levels in this cohort.

Table 4. Independent sample T-test based on gender variables.

Dimension	Sex	Members	Average value	Standard value	T	p	Cohen's d
Artificial intelligence concept	Male	24	4.19	0.90	0.095	0.924	0.022
	Female	105	4.17	0.95			
Ethics of artificial intelligence	Male	24	4.03	0.90	0.275	0.784	0.062
	Female	105	3.96	1.08			
Basic knowledge and application skills of artificial intelligence	Male	24	3.93	0.94	−0.024	0.981	−0.005
	Female	105	3.94	1.08			
AI integrated teaching method	Male	24	3.90	0.92	−0.294	0.769	−0.066
	Female	105	3.97	1.02			
AI supports teacher development	Male	24	3.83	1.00	−0.849	0.398	−0.192
	Female	105	4.03	1.01			

Current research indicates that gender-based disparities in AI acceptance manifest across dimensions such as perceived competence, value perception, instructional design, activity content, classroom culture, and organizational support, with males demonstrating statistically superior performance compared to females (Chen, 2022). A study on pre-service teachers further revealed significant gender differences in AI anxiety and perceived enjoyment, where gender moderated the path from AI anxiety to perceived ease of use and from perceived ease of use to perceived usefulness, suggesting gender's conditional influence on AI acceptance (Ma, 2024). However, this study found no statistically significant gender differences in AI acceptance among high school English teachers ($p = 0.771 > 0.05$), aligning with findings by Zhang and Gu (2023). Collectively, these results imply that gender is not a primary determinant of AI acceptance within this specific cohort.

c) Analysis of school type differences in AI acceptance among high school English teachers

With the scores of "artificial intelligence concept" and teachers' artificial intelligence ability framework as dependent variables and school type as control variables, univariate analysis of variance was performed. Since the homogeneity test of variance passed, the results of the F test assuming homogeneity of variance were used. The analysis result of variance test shows that, Teachers' artificial intelligence concepts ($F = 2.936$, $p < 0.001$, $\eta^2 = 0.087$), artificial intelligence ethics ($F = 2.956$, $p < 0.001$, $\eta^2 = 0.087$), basic knowledge and application skills of artificial intelligence ($F = 3.230$, $p < 0.001$, $\eta^2 = 0.094$), integration of AI and pedagogy ($F = 4.454$, $p < 0.001$, $\eta^2 = 0.126$), AI support for teacher professional development ($F = 4.442$, $p < 0.001$, $\eta^2 = 0.125$) had significant differences. The post-test results show that there are significant differences between teachers in municipal and district schools and other types of schools in terms of AI theory, and teachers in district schools have the highest acceptance of AI theory. In terms of AI ethics, district-level schools still have a great difference compared with provincial and rural

schools, and teachers in municipal and district-level schools have a higher acceptance of AI ethics. At the level of AI basic knowledge and skills, the overall picture is similar to that of AI ethics. In terms of AI-integrated teaching methods and AI-promoted personal development of teachers, there are significant differences between teachers in municipal and district schools and other types of schools, and teachers in municipal schools have higher acceptance in these two levels, and scores in municipal and district schools are significantly higher than those in provincial schools (see Table 5 for details).

Table 5. Analysis of variance by school type.

Dimension	School type	Numbers	Average value	Standard value	F	Significance
Dimension	Provincial level	21	3.59	1.01	2.936	0.000*
	City level	19	4.28	0.79		
	District level	75	4.34	0.85		
	Counties and towns	8	4.09	1.40		
	Rural area	6	3.90	0.90		
Artificial intelligence concept	Provincial level	21	3.36	0.97	2.956	0.000*
	City level	19	3.98	1.16		
	District level	75	4.17	0.94		
	Counties and towns	8	4.03	1.40		
	Rural area	6	3.50	1.00		
Ethics of artificial intelligence	Provincial level	21	3.28	1.00	3.230	0.000*
	City level	19	3.98	1.16		
	District level	75	4.14	0.93		
	Counties and towns	8	3.98	1.42		
	Rural area	6	3.53	1.01		
Basic knowledge and application skills of artificial intelligence	Provincial level	21	3.26	0.97	4.454	0.000*
	City level	19	4.18	0.92		
	District level	75	4.16	0.91		
	Counties and towns	8	3.79	1.36		
	Rural area	6	3.41	0.95		
AI integrated teaching method	Provincial level	21	3.26	1.06	4.442	0.000*
	City level	19	4.26	0.85		
	District level	75	4.17	0.90		
	Counties and towns	8	3.88	1.40		
	Rural area	6	3.57	0.90		

Note: * means $p < 0.05$, the same below.

The results show that there are significant differences in the acceptance of the five dimensions among teachers in different types of schools. Specifically, teachers in municipal and district schools scored significantly higher in the overall five dimensions than those in other types of schools. On the contrary, school teachers in

counties, towns and rural areas scored the lowest in AI acceptance, indicating that these two types of schools still have some problems and face some challenges in accepting and applying AI-related technologies. First of all, the network infrastructure and hardware facilities in counties, towns and rural areas are not perfect enough, and teachers cannot get enough technical support in the specific teaching process. Secondly, teachers who teach in towns and rural areas lack opportunities to be trained in artificial intelligence technology. In addition, township and rural areas lag behind in curriculum reform, which leads to a lack of opportunities and initiatives for teachers to try new technology-enabled education. Therefore, in the process of promoting the deepening reform of education, more precise support policies should be formulated for different types of schools to improve the acceptance level of artificial intelligence among teachers in various types of schools.

d) Analysis of teaching age difference of AI acceptance among high school English teachers

According to the teaching experience of the teachers, the teachers were divided into five groups: 0 - 5 years, 6 - 10 years, 11 - 15 years, 16 - 20 years and more than 20 years. The scores of the teachers in the artificial intelligence acceptance questionnaire are shown in Table 6. Each dimension score of "artificial intelligence concept" and teachers' artificial intelligence ability framework was taken as the dependent variable, and teaching age was taken as the control variable. One-way analysis of variance was conducted. Since the homogeneity test of variance passed, the F test results of assumed homogeneity of variance were adopted. Variance test analysis results show that, Teachers' artificial intelligence concepts ($F = 1.431$, $p = 0.027$, $\eta^2 = 0.044$), artificial intelligence ethics ($F = 3.383$, $p < 0.001$, $\eta^2 = 0.043$), basic knowledge and application skills of artificial intelligence ($F = 1.198$, $p = 0.315$, $\eta^2 = 0.037$), integration of AI and pedagogy ($F = 1.391$, $p = 0.241$, $\eta^2 = 0.043$), AI support for teacher professional development ($F = 1.516$, $p = 0.201$, $\eta^2 = 0.047$). The analysis of variance structure shows that there are significant differences in teachers' acceptance of AI ethics, but there are no significant differences in AI concepts, AI basic knowledge and skills, AI integrated teaching methods and AI promoting teacher development. The post-test results show that in terms of artificial intelligence ethics, teachers with 0 - 5 years of teaching age have the highest acceptance of artificial intelligence ethics, and the value is significantly higher than that of the other four age groups. From the bar chart as a whole, teachers with 0 - 5 years of teaching experience are significantly more accepting of AI at all levels than teachers with 11 - 15 years of teaching experience.

The analysis results show that teaching age has a significant impact on their acceptance in the level of "AI ethics". In general, the score of AI acceptance of teachers with teaching age of 0 - 15 years is significantly higher than that of teachers with teaching age of more than 15 years, especially teachers with teaching age of 0 - 5 years have the highest score in this respect, and their performance is very outstanding. This shows that young teachers with a short teaching age have a stronger acceptance and adaptability to AI technology. Li and Gu (2021) proposed

that young teachers usually have stronger acceptance and adaptability to new technologies. Growing up in the era of rapid development of information technology, they have a more natural cognition and acceptance of emerging technologies such as artificial intelligence. Teachers' technology cognition and teaching practice have a positive impact on the teaching effect of artificial intelligence. Dong et al. (2023) proposed that young teachers usually have strong learning ability and willingness, and can quickly learn and master new knowledge and skills. They are more willing to explore intelligent practice strategies and adapt to the practice process of AI teaching. Therefore, in the process of promoting the digital transformation of education, more attention should be paid to the training of teachers of different teaching ages to help older teachers improve their acceptance of AI.

Table 6. Analysis of variance of teaching age of teachers.

Dimension	Teaching age	Numbers	Average value	Standard value	F	Significance
Dimension	0 - 5 years	8	3.52	1.32	1.432	0.227
	6 - 10 years	6	4.36	0.54		
	11 - 15 years	23	4.41	0.74		
	16 - 20 years	30	4.11	0.85		
	20 years and above	62	4.18	1.00		
Artificial intelligence concept	0 - 5 years	8	3.41	1.27	3.383	0.002*
	6 - 10 years	6	3.92	1.04		
	11 - 15 years	23	4.33	0.86		
	16 - 20 years	30	3.84	1.07		
	20 years and above	62	3.98	1.05		
Ethics of artificial intelligence	0 - 5 years	8	3.48	1.30	1.198	0.315
	6 - 10 years	6	3.63	0.96		
	11 - 15 years	23	4.27	0.95		
	16 - 20 years	30	3.82	1.04		
	20 years and above	62	3.96	1.06		
Basic knowledge and application skills of artificial intelligence	0 - 5 years	8	3.32	1.20	1.391	0.241
	6 - 10 years	6	3.74	0.90		
	11 - 15 years	23	4.24	0.89		
	16 - 20 years	30	4.01	0.88		
	20 years and above	62	3.93	1.06		
AI integrated teaching method	0 - 5 years	8	3.36	1.19	1.516	0.201
	6 - 10 years	6	3.96	0.88		
	11 - 15 years	23	4.26	0.88		
	16 - 20 years	30	4.15	0.85		
	20 years and above	62	3.90	1.08		

Note: * means $p < 0.05$, the same below.

e) Analysis on the difference of the highest education level of AI acceptance among high school English teachers

The participants were divided into two groups according to the highest education level of each teacher: the undergraduate group and the master's degree or above group. The scores of the five dimensions are shown in Table 7.

The scores of "artificial intelligence concept" and teachers' artificial intelligence ability framework were used as dependent variables, and the teachers' highest education level was used as control variables. One-way ANOVA was performed. Since the homogeneity test of variance passed, the results of the F test assuming homogeneity of variance were used. Variance test analysis results show that, Teachers' artificial intelligence concepts ($F = 0.148$, $p = 0.702$, $\eta^2 = 0.001$), artificial intelligence ethics ($F = 0.123$, $p = 0.726$, $\eta^2 = 0.001$), basic knowledge and application skills of artificial intelligence ($F = 0.041$, $p = 0.893$, $\eta^2 = 0.000$), AI integrated teaching method ($F = 0.010$, $p = 0.920$, $\eta^2 = 0.000$), AI supporting teacher development ($F = 0.046$, $p = 0.830$, $\eta^2 = 0.000$). Post-test results show that there is no significant difference in digital literacy among teachers with different educational backgrounds in five dimensions.

Table 7. Analysis of variance of teacher education.

Dimension	Education Background	Numbers	Average value	Standard value	F	Significance
Dimension	Undergraduate	108	4.19	0.93	0.148	0.702
	Master degree or above	21	4.10	1.00		
Artificial intelligence concept	Undergraduate	108	3.99	1.05	0.123	0.726
	Master degree or above	21	3.90	1.07		
Ethics of artificial intelligence	Undergraduate	108	3.95	1.05	0.041	0.893
	Master degree or above	21	3.90	1.09		
Basic knowledge and application skills of artificial intelligence	Undergraduate	108	3.97	1.00	0.010	0.920
	Master degree or above	21	3.94	1.06		
AI integrated teaching method	Undergraduate	108	4.00	1.00	0.046	0.830
	Master degree or above	21	3.95	1.04		

The results of the analysis of variance show that there is no significant difference in teachers' acceptance of AI among different educational backgrounds. This shows that teachers' acceptance of artificial intelligence is not directly related to teachers' academic qualifications, and the improvement of teachers' acceptance of artificial intelligence also needs to accumulate experience through teaching practice, skill training and other activities. Therefore, in the process of improving teachers' overall acceptance of artificial intelligence, special attention should also

be paid to the development of teachers' practical ability and the progress of professional skills.

2) Ways to improve the acceptance of artificial intelligence among high school English teachers

Combined with the data analysis of the questionnaire survey and the in-depth analysis of the interview corpus, this study proposes the following ways to improve the acceptance of AI among high school English teachers.

a) Carry out long-term special training to help teachers steadily improve their artificial intelligence skills

According to the analysis of the questionnaire results, the scores of basic knowledge and applied skills of artificial intelligence are the lowest among the five dimensions. It can be found that there is still much room for improvement in the mastery of artificial intelligence skills by high school English teachers. In the interview process, T1 and T3 believed that the current teacher training in the topic of artificial intelligence is relatively small, if any, it is conducted once for a long time, and the continuity is not strong enough. T2 is a high school English teacher from a township. She believes that at present, relevant training is little and mostly carried out in district-level and city-level schools, and township teachers do not have enough opportunities to receive relevant training, and the training does not achieve full coverage. Feng (2022) pointed out that improving teachers' artificial intelligence skills can help teachers quickly adapt to the needs of intelligent society. Such special training should have the fundamental goal of improving teachers' basic cognition and operational methods of AI, so as to ensure that teachers can master and apply the latest AI tools skillfully, combined with specific teaching methods, so as to improve teaching quality and efficiency. In addition, such activities should be carried out for a long time and a mature training system should be formed. Continuous evaluation of teachers should be carried out during the training process, and a feedback mechanism should be established to help teachers adjust their learning methods in time.

b) Continue to update the teaching concept to help teachers deeply understand the concept of artificial intelligence

At present, it is the critical period for the Ministry of Education to carry out artificial intelligence to boost the construction of teachers, but there are still problems such as insufficient cognition and concept in the field of promoting teachers' artificial intelligence concept and difficulties in promoting teachers' lifelong learning. In the interview process, T2 and T4 both believe that there are a large number of old teachers among senior high school teachers, and middle-aged teachers do not have a high grasp of the latest teaching concepts. As a result, many teachers are unable to obtain the latest artificial intelligence concepts and apply them to practice, so it is very important to improve teachers' artificial intelligence concepts. Hu (2024) pointed out that teachers need to improve their cognition of artificial intelligence and enhance their ability to adapt to the development needs of the era of artificial intelligence. This includes transforming and updating the

concept of education and teaching, and enhancing the application ability of artificial intelligence. In addition, teachers should be encouraged to carry out more exchanges and cooperation to form an experience sharing platform, which will help to jointly solve some problems and difficulties encountered in teaching, and better promote teachers' in-depth understanding of artificial intelligence concepts.

c) Carry out educational research projects to help teachers develop their professional competence steadily and steadily

At present, there are always problems of uneven level of teachers and uneven distribution of educational resources among senior high school English teachers. During the interview, respondents all believed that at present, some high schools, such as provincial and municipal key high schools, have begun to carry out relevant artificial intelligence education research projects, but the number is still very small. T5, from a high school in a rural area, said in the interview that at present, schools in towns and rural areas have no access to similar educational research projects, and the opportunities are very limited. Dong (2024) pointed out that it is necessary to promote the expansion of the coverage of educational research projects, so that front-line teachers can have the opportunity to participate in the projects and summarize and understand in the projects. Only in this way can teachers' professional development be better promoted. Relevant government functional departments should also strengthen the balance of resources between regions, achieve reasonable allocation of educational resources, and truly make the development of front-line teachers' professional ability steady and long-term.

6. Summary

This study uses a mixture of quantitative and qualitative research methods, combined with the framework of teachers' artificial intelligence competence issued by UNESCO (2024), and takes 129 teachers who participated in a teacher training in a district as cases to explore the acceptance of high school English teachers' application of artificial intelligence in teaching, its influencing factors and improvement paths. The results show that the overall acceptance of AI among high school English teachers is above the average level, but there are structural differences among the five dimensions of the AI Competency Framework. The follow-up research can be carried out by expanding the scope of the investigation and conducting a large-scale questionnaire survey to deeply explore the acceptance of the application of artificial intelligence in the classroom among high school English teachers in different regions and at different levels. At the same time, a long-term follow-up survey was carried out on newly hired high school English teachers to explore the actual effects and improvement paths in the process of integrating artificial intelligence in teaching, so as to improve the training system of artificial intelligence literacy for English teachers and promote the continuous progress and development of high school English teaching.

Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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