ASIA PACIFIC JOURNAL OF EDUCATION AND SOCIETY

Asia Pacific Journal of Education and Society, 2026, 14(2), Article 10
eISSN: 3177-7743

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Research paper

AI Literacy and Self-Efficacy as Determinants of AI Usage among Nigerian Social Studies Pre-Service Teachers

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Citation: Akinsanya, B. O., & Oshinfowokan, S. A. (2026). AI literacy and self-efficacy as determinants of AI usage among Nigerian Social Studies pre-service teachers. *Asia Pacific Journal of Education and Society, 14*(2), Article 10. https://doi.org/10.20897/apjes/19935

Published: November 11, 2026

ABSTRACT

Artificial intelligence (AI) is reshaping teaching and learning worldwide, yet evidence on what drives its use among teacher trainees in Nigerian Colleges of Education remains limited. This study examined AI literacy and self-efficacy as determinants of AI usage among social studies pre-service teachers in Ogun State Colleges of Education. A descriptive survey design was adopted, and a multistage sampling procedure was used to select 120 social studies pre-service teachers from Sikiru Adetona College of Education, Science and Technology, Omu-Ajose, and Federal College of Education, Osiele, Abeokuta. Data were collected using a validated four-point Likert-scale instrument, the Questionnaire on AI Literacy, Self-Efficacy and AI Usage (QALSAU). Three research questions were answered using frequency counts, percentages, means and standard deviations, while three null hypotheses were tested using Pearson Product-Moment Correlation and multiple regression analysis at the 0.05 level of significance. Results showed that the level of AI literacy among the respondents was high ($\bar{x}$ = 3.11, SD = 0.89) and their level of AI self-efficacy was likewise high ($\bar{x}$ = 2.99, SD = 0.96), although actual utilisation of AI tools occurred only to some extent ($\bar{x}$ = 2.95, SD = 0.95). AI literacy had a significant relationship with AI usage ($r = .777$, $df = 118$, $p < .05$), as did AI self-efficacy ($r = .402$, $df = 118$, $p < .05$). Jointly, the two predictors accounted for 60.1% of the variance in AI usage ($R^2 = .608$, $F(2, 117) = 90.713$, $p < .05$). The study concludes that competence and confidence jointly drive AI engagement, and recommends structured AI literacy instruction, guided practice and improved digital infrastructure in teacher education programmes.

Keywords: artificial intelligence, AI literacy, self-efficacy, AI usage, pre-service teachers, social studies education, teacher education

The rapid advancement of artificial intelligence (AI) technologies has significantly transformed several sectors of human endeavour, education inclusive. Artificial intelligence refers to computer systems and applications capable of performing tasks that ordinarily require human intelligence, such as learning, reasoning, problem-solving, language processing and decision-making. In recent years, AI-driven tools including intelligent tutoring systems, automated assessment platforms, adaptive learning applications, chatbots and generative AI tools have been increasingly integrated into teaching and learning processes across the globe. Luckin et al. (2016) and Holmes et al. (2019) argue that AI holds considerable potential to personalise learning, support teachers' instructional practices, strengthen assessment and improve learning outcomes.

In teacher education, the role of AI is even more consequential. Pre-service teachers are expected to acquire not only pedagogical and subject-matter knowledge but also the digital competencies demanded by twenty-first century

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classrooms. According to UNESCO (2023), teachers' preparedness to integrate emerging technologies such as AI into instruction depends largely on their technological knowledge, confidence and beliefs about technology use. Consequently, AI literacy and self-efficacy have emerged as key constructs for understanding teachers' adoption and use of AI tools in education.

AI literacy has been conceptualised as the ability to understand, use, evaluate and critically reflect on AI technologies in ethical and pedagogically meaningful ways. Long and Magerko (2020) describe it as encompassing knowledge of AI concepts, awareness of AI applications, understanding of data and algorithms, and the capacity to make informed decisions about AI use. Ayanwale et al. (2024) similarly argue that AI literacy among pre-service teachers involves not only technical awareness but also pedagogical competence in applying AI tools to support teaching and learning. Without adequate AI literacy, pre-service teachers may struggle to integrate AI technologies meaningfully into instructional practice, regardless of the availability of such tools.

Self-efficacy, on the other hand, refers to an individual's belief in their capability to organise and execute the actions required to manage prospective situations. Rooted in Bandura's (1997) social cognitive theory, self-efficacy is widely recognised as a strong predictor of technology adoption. In the context of AI in education, AI self-efficacy describes pre-service teachers' confidence in their ability to learn, use, and apply AI tools effectively for academic and professional tasks. Studies by Dergaa et al. (2023) and Dai et al. (2020) demonstrate that teachers and teacher trainees with higher technological self-efficacy are more likely to experiment with, adopt, and sustain the use of AI tools in instructional settings.

Empirical work across different educational contexts consistently identifies AI literacy and self-efficacy as significant determinants of AI usage. Dai et al. (2020) found that self-efficacy and behavioural intention significantly predicted the frequency of AI use among pre-service teachers, while Ayanwale et al. (2024) reported that AI literacy positively influenced pre-service teachers' readiness and willingness to integrate AI into teaching. Adigun and Miranda (2025), by contrast, observed that although self-efficacy may not always exert a direct influence on AI adoption intention, it operates indirectly through constructs such as perceived usefulness and performance expectancy.

In Nigeria, the integration of AI into education remains at an emerging stage, particularly within Colleges of Education, which are responsible for training teachers for the basic education level. Ogun State, which hosts several such institutions, plays a strategic role in teacher preparation in south-western Nigeria. Despite increasing access to digital technologies, Amuda (2024) and Ayanwale et al. (2025) indicate that many pre-service teachers in Nigerian Colleges of Education possess limited awareness, low functional AI literacy, and uneven confidence in using AI tools for academic and instructional purposes. These challenges are compounded by inadequate infrastructure, limited institutional policy on AI integration, and insufficient training opportunities.

Despite the growing global adoption of AI in education, evidence suggests that many social studies pre-service teachers, particularly in developing contexts such as Nigeria, are not adequately prepared to integrate AI into teaching and learning. In Ogun State Colleges of Education, prior studies and classroom observations indicate that while some students are exposed to AI tools such as chatbots and automated learning platforms, their usage is often informal, unguided and not pedagogically grounded. The absence of structured AI literacy training and the presence of low self-efficacy may hinder effective AI integration in future classrooms; if pre-service teachers graduate without adequate AI competence and confidence, they may resist or misuse AI technologies, thereby limiting the benefits of AI for teaching and learning. The problem addressed in this study, therefore, is the insufficient empirical understanding of how AI literacy and self-efficacy influence AI usage among social studies pre-service teachers in Ogun State Colleges of Education.

Objectives of the study

The main objective of this study was to examine AI literacy and self-efficacy as determinants of AI usage among social studies pre-service teachers in Ogun State Colleges of Education. Specifically, the study sought to:

1. Assess the level of AI literacy among social studies pre-service teachers in Ogun State Colleges of Education;
2. Determine the level of AI self-efficacy among social studies pre-service teachers in Ogun State Colleges of Education;
3. Examine the extent of AI usage among social studies pre-service teachers in Ogun State Colleges of Education;
4. Investigate the influence of AI literacy on AI usage among social studies pre-service teachers; and
5. Examine the influence of self-efficacy on AI usage among social studies pre-service teachers.

Research questions

The following research questions guided the study:

1. What is the level of AI literacy among social studies pre-service teachers in Ogun State Colleges of Education?

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2. What is the level of AI self-efficacy among social studies pre-service teachers in Ogun State Colleges of Education?
3. To what extent do social studies pre-service teachers in Ogun State Colleges of Education use AI tools?

Hypotheses

The following null hypotheses were tested at the 0.05 level of significance:

1. H_{01}: AI literacy has no significant influence on AI usage among social studies pre-service teachers in Ogun State Colleges of Education.
2. H_{02}: AI self-efficacy has no significant influence on AI usage among social studies pre-service teachers in Ogun State Colleges of Education.
3. H_{03}: AI literacy and self-efficacy have no significant combined influence on AI usage among social studies pre-service teachers in Ogun State Colleges of Education.

CONCEPTUAL REVIEW

Artificial intelligence in education

Artificial intelligence in education refers to the application of AI technologies to support, enhance and transform teaching and learning processes. Holmes et al. (2019) describe AI in education as the use of intelligent systems capable of adapting to learners' needs, providing real-time feedback and supporting teachers in instructional decision-making. Tools such as intelligent tutoring systems, adaptive learning platforms, automated assessment applications, chatbots and learning analytics systems are increasingly deployed to personalise learning experiences and improve educational outcomes.

AI applications also facilitate interactive and experiential learning through simulations, virtual laboratories and scenario-based exercises that enhance understanding and retention. They support differentiated instruction by identifying learners' strengths, weaknesses and preferences, enabling teachers to tailor learning experiences to individuals. Luckin et al. (2016) note that AI can analyse large datasets generated from student interaction to produce actionable insights that inform curriculum design, teaching strategies and assessment practice. In teacher education specifically, AI plays a critical role in preparing future teachers to function effectively in digitally enriched classrooms, a process that requires not only access to technology but also the competence and readiness to use it responsibly.

Conceptually, AI in education is not a single technology but a family of applications that differ in whom they serve. Baker and Smith (2019) distinguish learner-facing tools, which students use directly to receive instruction or feedback; teacher-facing tools, which reduce workload and support planning, assessment and classroom management; and system-facing tools, which inform administrative and institutional decisions. In their systematic review of AI applications in higher education, Zawacki-Richter et al. (2019) similarly identified four broad areas of application: profiling and prediction, assessment and evaluation, adaptive systems and personalisation, and intelligent tutoring systems. The emergence of generative AI has widened this landscape considerably, because conversational tools that produce text, images and lesson materials on request are now available directly to students and teachers without institutional mediation (UNESCO, 2023). For pre-service teachers, this means that AI is encountered simultaneously as a learner-facing tool for their own studies and as a teacher-facing tool for their future practice, a dual role that informs the way AI usage is conceptualised in this study.

For social studies in particular, a subject concerned with citizenship, values, social institutions and contemporary issues, AI offers opportunities to source and compare perspectives, generate case scenarios and localise instructional materials. The same features, however, raise concerns that are especially salient for the subject: AI-generated content may be inaccurate, culturally decontextualised or biased, and uncritical reliance on it raises questions of academic integrity and data privacy (Akgun & Greenhow, 2022; UNESCO, 2023). AI in education is therefore understood in this study as both a pedagogical resource and an object of critical scrutiny.

Concept of AI literacy

AI literacy is a multidimensional construct encompassing knowledge, skills, attitudes and ethical awareness related to artificial intelligence. Long and Magerko (2020) define it as the ability to understand what AI is, how it works, how it is used in society, and how individuals can interact with AI systems effectively. In teacher education, AI literacy extends to the pedagogical application of AI tools and the ability to evaluate AI-generated output critically.

Four dimensions are commonly distinguished. The cognitive dimension concerns understanding of AI concepts, algorithms and underlying principles. The technical dimension involves the ability to operate AI tools and platforms, including automated grading systems, intelligent tutoring software and adaptive learning

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applications. The ethical dimension covers the societal implications of AI, including bias, data privacy and responsible use. The practical dimension focuses on applying AI skills to solve real educational problems, design instructional materials and support student learning (Ayanwale et al., 2024). Developing AI literacy among pre-service teachers is therefore critical to ensuring that AI tools enhance learning outcomes rather than merely serving convenience.

AI literacy should be distinguished from the broader notion of digital literacy. Digital literacy concerns the technical, cognitive and social-emotional capabilities needed to use digital technologies in general (Ng, 2012), whereas AI literacy addresses systems that learn from data, generate outputs that are probabilistic rather than fixed, and may reproduce the biases embedded in their training data. A person may therefore be digitally proficient and yet unable to judge when an AI-generated response is unreliable. In their exploratory review, Ng et al. (2021) organised the construct around four aspects: knowing and understanding AI, using and applying AI, evaluating and creating AI, and AI ethics. This framing presents AI literacy as a progression from basic awareness to critical judgement rather than as a single undifferentiated skill.

For teachers, the construct carries an additional pedagogical layer. The UNESCO (2024) AI competency framework for teachers specifies five dimensions (a human-centred mindset, ethics of AI, AI foundations and applications, AI pedagogy, and AI for professional learning) across three levels of progression: acquire, deepen and create. Celik (2023), extending the technological pedagogical content knowledge tradition, likewise argues that teachers require not only technological knowledge of AI but also the pedagogical knowledge to integrate it into instruction and the ethical knowledge to assess its decisions. In line with these positions, AI literacy is operationalised in this study as pre-service teachers' self-reported understanding of AI concepts and tools, their ability to evaluate AI-generated content critically, their awareness of ethical issues and responsible use, and their knowledge of how AI applies to lesson planning and instructional delivery. Because the construct is measured through self-report, it reflects perceived rather than demonstrated literacy.

Concept of AI self-efficacy

Self-efficacy is a psychological construct rooted in Bandura's (1997) social cognitive theory, referring to an individual's belief in their capability to perform specific tasks successfully. It influences motivation, effort, persistence and resilience in the face of difficulty, and has been widely recognised in educational technology research as a strong predictor of technology acceptance, adoption and sustained use.

AI self-efficacy refers specifically to pre-service teachers' confidence in their ability to learn, use and apply AI tools for academic and instructional purposes. It includes beliefs about operating AI-powered educational software, using intelligent tutoring systems, designing AI-supported lesson plans and engaging students through AI-enhanced learning activities. High levels of AI self-efficacy are associated with greater experimentation with AI tools, higher frequency of use and willingness to explore innovative instructional strategies (Dergaa et al., 2023). Evidence from the Nigerian higher education context supports this position: Oyewole and Jatau (2025), studying social sciences lecturers in Oyo State, found that technological self-efficacy, together with access to online databases, significantly predicted the usability of AI for research purposes, suggesting that confidence functions as an enabling condition for AI engagement across levels of the education system. Hoya et al. (2024) further report that pre-service teachers with high AI self-efficacy were more likely to integrate AI meaningfully into pedagogical practice, demonstrating proactive learning behaviour and greater problem-solving capacity in digital instructional environments.

Two features of the construct deserve emphasis. First, self-efficacy is domain-specific: confidence in one area of activity does not automatically transfer to another. This is why researchers have progressively refined general self-efficacy into computer self-efficacy (Compeau & Higgins, 1995) and, more recently, into AI self-efficacy, which Wang and Chuang (2024) describe in terms of four dimensions, namely assistance, anthropomorphic interaction, comfort with AI and technological skills. Second, Bandura (1997) identifies four sources from which efficacy beliefs develop: mastery experiences, vicarious experiences, verbal persuasion, and physiological and affective states. For pre-service teachers, these correspond respectively to successful hands-on use of AI tools, observing lecturers and peers use such tools, encouragement and feedback from instructors, and the reduction of anxiety associated with unfamiliar technology.

AI self-efficacy is also conceptually distinct from AI literacy. Literacy refers to what an individual knows and is able to do with AI, whereas self-efficacy refers to the individual's belief about that capability. The two usually develop together, since knowledge gained through practice builds confidence, but they can diverge: a knowledgeable trainee may hesitate to use AI in a classroom for lack of confidence, while a confident one may overestimate the quality of AI-generated output. Treating the two as separate predictors, as this study does, makes it possible to examine the contribution of each. In this study, AI self-efficacy is operationalised as pre-service teachers' confidence in learning to use AI tools, using them independently for academic work, applying them to

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lesson preparation and future classroom teaching, overcoming difficulties encountered during use, and using them without over-dependence.

AI usage in teacher education

AI usage in teacher education refers to the extent to which pre-service teachers employ AI tools in academic, instructional, and professional activities such as lesson planning, content generation, research support, assessment preparation, classroom simulation, and professional learning. According to Hoya et al. (2024), the frequency and depth of AI usage depend largely on perceived usefulness, confidence, and institutional support. In practice, AI usage also extends to collaborative learning environments, where AI tools facilitate real-time feedback and coordination, and to reflective practice, where analytics on teaching strategies and student responses help trainees refine their pedagogical approaches.

Beyond generic academic support, AI is increasingly being applied to subject-specific instruction: Jekayinfa et al. (2025) demonstrated how AI tools can be integrated into the teaching of family concepts in Nigerian schools, illustrating the pedagogical possibilities available to social studies teachers who possess the requisite competence. Similarly, Oyewole et al. (2026) found that technological adaptation significantly predicted inclusive teaching practices among social studies pre-service teachers in Ogun State, indicating that the capacity to adapt to emerging technologies shapes not only whether such tools are used but also the quality of the instruction they support. In developing countries such as Nigeria, however, AI usage in teacher education remains at an emerging stage. Amuda (2024) reported that although pre-service teachers in Colleges of Education are increasingly aware of AI tools, their usage is largely confined to informal academic purposes rather than structured pedagogical application, underscoring the need to examine the factors that shape meaningful AI usage.

Conceptually, usage must be separated from the intention to use. Technology acceptance research treats behavioural intention as an antecedent of actual use rather than as its equivalent (Davis, 1989; Venkatesh et al., 2003), and a favourable disposition towards AI does not guarantee that the tools are in fact employed. Usage can also be described along several dimensions: how often AI tools are used, the purposes for which they are used and the depth of that use, which ranges from simple information retrieval to the design of instructional materials. Among pre-service teachers, purpose is the most informative of these, because learning-oriented use (studying, completing assignments and searching for information) is different in kind from teaching-oriented use (lesson planning, micro-teaching and the development of instructional materials). In this study, AI usage is operationalised as the self-reported extent to which pre-service teachers employ AI tools for both sets of purposes, together with their intention to continue doing so in their teaching career. This distinction allows the study to show not only whether AI tools are used but also what they are used for.

Relationship among AI literacy, self-efficacy and AI usage

AI literacy provides the foundational knowledge and skills required for understanding and operating AI tools, while self-efficacy shapes individuals' confidence and willingness to engage with such technologies. Empirical evidence suggests that pre-service teachers with higher levels of both constructs are more likely to adopt and use AI tools effectively. Adigun and Miranda (2025) noted that AI literacy enhances perceived usefulness and ease of use, which in turn positively influence adoption intention; self-efficacy, although sometimes exerting only an indirect effect, remains a crucial determinant of usage by shaping attitudes, motivation and persistence.

Empirical studies conducted in Nigeria offer a mixed picture. Ayanwale et al. (2025) found that although pre-service teachers demonstrated basic awareness of AI technologies, many lacked deeper conceptual knowledge of principles such as algorithms, data bias, machine learning and ethical considerations, restricting their capacity to evaluate AI-generated content critically. Amuda (2024), studying pre-service teachers in a Federal College of Education in Ogun State, reported moderate awareness but low functional AI literacy: respondents could identify AI tools and use them occasionally for assignments and research, yet lacked the pedagogical competence to apply them to lesson planning, assessment design or classroom instruction. Ayanwale et al. (2024) observed that pre-service teachers with access to AI-related workshops, coursework and guided practice demonstrated higher AI literacy and self-efficacy than those relying solely on self-directed exploration. In a larger survey of 796 pre-service teachers in Nigerian universities, Sanusi et al. (2024) found that basic knowledge of AI and subjective norm were the strongest determinants of intention to learn AI, indicating that competence and a supportive social environment operate together rather than in isolation. In a related vein, Ogundipe and Oyewole (2025) reported that technological proficiency and virtual collaboration significantly predicted global adaptability among social studies pre-service teachers, reinforcing the view that technological competence carries consequences well beyond tool use itself.

Internationally, Long and Magerko (2020) observed that pre-service teachers often possess fragmented AI knowledge, characterised by familiarity with applications but limited understanding of their mechanisms and

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educational implications, which may lead to uncritical dependence rather than informed use. Dergaa et al. (2023) found that AI self-efficacy improved significantly following targeted training interventions, leading to higher levels of AI utilisation in instructional design and student engagement. Taken together, the reviewed literature indicates that AI literacy and self-efficacy are critical determinants of AI usage; however, few studies have examined their combined influence within Colleges of Education in Ogun State, and Nigerian studies have emphasised awareness and readiness rather than actual usage behaviour. The present study addresses this gap.

THEORETICAL FRAMEWORK

This study is anchored on two complementary theories: Bandura's social cognitive theory and the technology acceptance model. Together, they provide a foundation for understanding how AI literacy and self-efficacy influence AI usage among pre-service teachers.

Social cognitive theory (Bandura, 1997)

Social cognitive theory posits that human behaviour is determined by the reciprocal interaction of personal factors, environmental influences and behavioural patterns. Central to the theory is self-efficacy, an individual's belief in their capacity to perform a specific task. Applied to AI in teacher education, the theory suggests that pre-service teachers' confidence in their ability to learn and use AI tools significantly influences their actual usage behaviour. The theory also emphasises observational learning, modelling and reinforcement, indicating that pre-service teachers can develop AI competencies by observing peers, receiving feedback from instructors and practising with AI tools in supportive environments. This perspective underscores the importance of fostering both confidence and competence, and it provides the theoretical justification for treating self-efficacy as a determinant of AI usage in this study.

Technology acceptance model (Davis, 1989)

The technology acceptance model explains users' acceptance and adoption of technology in terms of perceived usefulness and perceived ease of use. According to the model, the likelihood of using a technology increase when individuals perceive it as beneficial for their tasks and easy to operate. In the present context, AI literacy enhances pre-service teachers' understanding of AI tools and their potential applications, thereby increasing perceived usefulness; higher AI literacy also reduces perceived complexity, making AI tools easier to use. The model further highlights the mediating role of behavioural intention, suggesting that AI literacy and self-efficacy influence intention to use AI, which in turn affects actual usage. The model therefore provides a structured framework for assessing the determinants of AI adoption and usage in teacher education settings and justifies the inclusion of AI literacy as a predictor variable in this study.

Taken together, the two theories explain the relationships examined in this study. Social cognitive theory accounts for the role of AI self-efficacy, while the technology acceptance model accounts for the role of AI literacy through its effect on perceived usefulness and perceived ease of use. Accordingly, AI literacy and AI self-efficacy are treated as the independent variables and AI usage as the dependent variable. Because knowledge gained through practice strengthens confidence, and confidence in turn encourages further practice, the two predictors are also expected to be related; the study therefore examines their separate as well as their combined influence on AI usage, corresponding to hypotheses one to three. Contextual conditions such as access to devices and the internet, institutional policy and the availability of training may facilitate or constrain usage, but they lie outside the variables measured in this study.

METHODOLOGY

The study adopted a descriptive survey research design, which was considered appropriate because it enabled the collection of data from a representative sample of pre-service teachers and the description of existing conditions regarding AI literacy, self-efficacy and AI usage without manipulation of variables. The population comprised all social studies pre-service teachers (Nigeria Certificate in Education students) in Sikiru Adetona College of Education, Science and Technology, Omu-Ajose, and Federal College of Education, Osiele, Abeokuta, both in Ogun State, Nigeria, from which a sample of 120 respondents was drawn using a multistage sampling technique: the two Colleges of Education were purposively selected based on accessibility and availability of social studies pre-service teachers; departments and academic levels were then selected using stratified sampling to ensure fair representation across NCE I, NCE II and NCE III; and respondents were finally selected using simple random sampling, so that every eligible pre-service teacher had an equal chance of selection. Data were collected using a structured questionnaire titled Questionnaire on AI Literacy, Self-Efficacy and AI Usage (QALSAU), developed by the researcher and comprising four sections: Section A elicited demographic information (gender, academic level and institution), while Sections B, C and D contained eight items each measuring AI literacy, AI self-efficacy

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and the extent of AI usage respectively, structured on a four-point Likert scale ranging from Strongly Agree (4) to Strongly Disagree (1). The instrument was subjected to face and content validation by experts in social studies education and educational technology, whose observations were incorporated into the final version. To establish its reliability, the questionnaire was pilot-tested on a separate group of 30 social studies pre-service teachers who possessed characteristics similar to those of the target population but did not form part of the main sample, so that pilot participation could not influence the substantive findings. Responses from the pilot were subjected to internal consistency analysis, yielding Cronbach's alpha coefficients of 0.75 for the AI literacy subscale, 0.71 for the AI self-efficacy subscale and 0.74 for the AI usage subscale. As all three coefficients exceeded the 0.70 threshold conventionally regarded as acceptable in social science research, the instrument was considered sufficiently reliable for the study. Copies of the questionnaire were administered personally by the researcher with the assistance of trained research assistants, which ensured a high response rate and allowed respondents to seek clarification where necessary; participation was voluntary, respondents were informed of the purpose of the study, and anonymity and confidentiality of responses were assured. Data were analysed using both descriptive and inferential statistics, with frequency counts, percentages, means and standard deviations used to summarise demographic data and answer the research questions. Decisions on the research questions were based on the following criteria: for AI literacy and self-efficacy, Very High (3.26–4.00), High (2.51–3.25), Low (1.76–2.50) and Very Low (1.00–1.75); and for AI usage, To a Great Extent (3.26–4.00), To Some Extent (2.51–3.25), To a Little Extent (1.76–2.50) and Not at All (1.00–1.75). Pearson Product-Moment Correlation was used to test hypotheses one and two, multiple regression analysis was used to test hypothesis three, and all hypotheses were tested at the 0.05 level of significance using the Statistical Package for the Social Sciences (SPSS).

RESULTS

Demographic characteristics of respondents

Table 1 shows that 55.0% (66) of the respondents were male while 45.0% (54) were female. It further reveals that 51.7% (62) were drawn from Sikiru Adetona College of Education, Science and Technology, Omu-Ajose, while 48.3% (58) were from Federal College of Education, Osiele, Abeokuta.

As shown in Table 2, 16.7% (20) of the respondents were in NCE I, 50.8% (61) in NCE II and 32.5% (39) in NCE III.

Table 1

Institution–gender cross-tabulation of social studies pre-service teachers (N = 120)

Institution	Male n	Male %	Female n	Female %	Total n (%)
SACOETEC, Omu-Ajose	25	20.8	37	30.8	62 (51.7)
FCE, Osiele, Abeokuta	41	34.2	17	14.2	58 (48.3)
Total	66	55.0	54	45.0	120 (100.0)

Note. SACOETEC = Sikiru Adetona College of Education, Science and Technology; FCE = Federal College of Education.

Table 2

Academic level of social studies pre-service teachers (N = 120)

Academic level	N	%
NCE I	20	16.7
NCE II	61	50.8
NCE III	39	32.5
Total	120	100.0

Research Question 1: What is the level of AI literacy among social studies pre-service teachers in Ogun State Colleges of Education?

Table 3 presents the level of AI literacy among the respondents. It shows that 87.5% (105) understood the basic concept of artificial intelligence, while 76.7% (92) were aware of the different AI tools that can be used for learning and teaching. Furthermore, 80.0% (96) reported knowing how AI tools generate information and responses, and 79.1% (95) indicated that they understood the ethical issues involved in the use of AI in education. In addition, 74.2% (89) could use AI tools responsibly for academic purposes, while 83.3% (100) knew how AI could be applied to lesson planning and instructional delivery. With a weighted mean of 3.11 and a standard

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deviation of 0.89, the level of AI literacy among social studies pre-service teachers in Ogun State Colleges of Education was high.

Table 3

Level of AI literacy among social studies pre-service teachers (N = 120)

S/N	Items	SA	A	D	SD	Mean	S.D.
1	I understand the basic concept of artificial intelligence (AI).	60 (50.0)	45 (37.5)	6 (5.0)	9 (7.5)	3.30	0.88
2	I am aware of different AI tools that can be used for learning and teaching.	32 (26.7)	60 (50.0)	28 (23.3)	–	3.03	0.71
3	I know how AI tools generate information and responses.	48 (40.0)	48 (40.0)	15 (12.5)	9 (7.5)	3.13	0.90
4	I can differentiate between AI-generated content and human-generated content.	47 (39.2)	33 (27.5)	29 (24.2)	11 (9.2)	2.97	1.00
5	I understand the ethical issues involved in the use of AI in education.	52 (43.3)	43 (35.8)	25 (20.8)	–	3.23	0.77
6	I can use AI tools responsibly for academic purposes.	51 (42.5)	38 (31.7)	28 (23.3)	3 (2.5)	3.14	0.86
7	I know how AI can be applied to lesson planning and instructional delivery.	49 (40.8)	51 (42.5)	9 (7.5)	11 (9.2)	3.15	0.91
8	I am able to critically evaluate information generated by AI tools.	44 (36.7)	41 (34.2)	14 (11.7)	21 (17.5)	2.90	1.09
	Weighted mean / Overall					3.11	0.89

Note. Figures represent frequency with percentage in parentheses. SA = Strongly Agree; A = Agree; D = Disagree; SD = Strongly Disagree. Decision rule: Very High = 3.26–4.00; High = 2.51–3.25; Low = 1.76–2.50; Very Low = 1.00–1.75.

Research Question 2: What is the level of AI self-efficacy among social studies pre-service teachers in Ogun State Colleges of Education?

Table 4 presents the level of AI self-efficacy among the respondents. It shows that 78.4% (94) were confident in their ability to learn how to use AI tools, while 70.8% (85) felt confident using AI tools to prepare assignments and projects. In addition, 72.5% (87) indicated that they could use AI tools to support lesson preparation during teaching practice, and 68.3% (82) felt capable of integrating AI tools into future classroom teaching. It was further observed that 68.3% (82) believed they could overcome challenges encountered while using AI tools, while 82.5% (99) were confident in using AI tools responsibly without over-dependence. With a weighted mean of 2.99 and a standard deviation of 0.96, the level of AI self-efficacy among social studies pre-service teachers in Ogun State Colleges of Education was high.

Table 4

Level of AI self-efficacy among social studies pre-service teachers (N = 120)

S/N	Items	SA	A	D	SD	Mean	S.D.
1	I am confident in my ability to learn how to use AI tools.	53 (44.2)	41 (34.2)	7 (5.8)	19 (15.8)	3.07	1.07
2	I can independently use AI tools for my academic work.	31 (25.8)	56 (46.7)	22 (18.3)	11 (9.2)	2.89	0.90
3	I feel confident using AI tools to prepare assignments and projects.	50 (41.7)	35 (29.2)	12 (10.0)	23 (19.2)	2.93	1.14
4	I can use AI tools to support lesson preparation during teaching practice.	40 (33.3)	47 (39.2)	28 (23.3)	5 (4.2)	3.02	0.86
5	I am confident in applying AI tools to solve academic problems.	34 (28.3)	50 (41.7)	18 (15.0)	18 (15.0)	2.83	1.01

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S/N	Items	SA	A	D	SD	Mean	S.D.
6	I feel capable of integrating AI tools into future classroom teaching.	50 (41.7)	32 (26.7)	27 (22.5)	11 (9.2)	3.01	1.01
7	I can overcome challenges encountered while using AI tools.	37 (30.8)	45 (37.5)	29 (24.2)	9 (7.5)	2.92	0.92
8	I am confident in using AI tools responsibly without over-dependence.	49 (40.8)	50 (41.7)	18 (15.0)	3 (2.5)	3.21	0.79
	Weighted mean / Overall					2.99	0.96

Note. Figures represent frequency with percentage in parentheses. Decision rule: Very High = 3.26–4.00; High = 2.51–3.25; Low = 1.76–2.50; Very Low = 1.00–1.75.

Research Question 3: To what extent do social studies pre-service teachers in Ogun State Colleges of Education use AI tools?

Table 5 shows the extent to which the respondents use AI tools. It reveals that 78.3% (94) regularly used AI tools for studying and understanding course content, while 87.5% (105) used AI tools to search for academic information and research materials. Similarly, 73.3% (88) used AI tools to assist in lesson planning and teaching preparation, and 80.8% (97) used them to improve academic performance. It was also observed that 78.3% (94) used AI tools during teaching practice or micro-teaching sessions, while 61.7% (74) intended to continue using AI tools in their future teaching career. With a weighted mean of 2.95 and a standard deviation of 0.95, it is concluded that social studies pre-service teachers in Ogun State Colleges of Education utilised AI tools to some extent.

Table 5

Extent of AI tools usage among social studies pre-service teachers (N = 120)

S/N	Items	SA	A	D	SD	Mean	S.D.
1	I regularly use AI tools for studying and understanding course content.	43 (35.8)	51 (42.5)	13 (10.8)	13 (10.8)	3.03	0.95
2	I use AI tools to complete assignments and academic tasks.	30 (25.0)	48 (40.0)	23 (19.2)	19 (15.8)	2.74	1.01
3	I use AI tools to search for academic information and research materials.	51 (42.5)	54 (45.0)	9 (7.5)	6 (5.0)	3.25	0.80
4	I use AI tools to assist in lesson planning and teaching preparation.	41 (34.2)	47 (39.2)	20 (16.7)	12 (10.0)	2.98	0.96
5	I use AI tools to improve my academic performance.	47 (39.2)	50 (41.7)	11 (9.2)	12 (10.0)	3.10	0.94
6	I use AI tools during teaching practice or micro-teaching sessions.	40 (33.3)	54 (45.0)	13 (10.8)	13 (10.8)	3.01	0.94
7	I use AI tools to develop teaching aids or instructional materials.	24 (20.0)	50 (41.7)	26 (21.7)	20 (16.7)	2.65	0.98
8	I intend to continue using AI tools in my future teaching career.	42 (35.0)	32 (26.7)	32 (26.7)	14 (11.7)	2.85	1.03
	Weighted mean / Overall					2.95	0.95

Note. Figures represent frequency with percentage in parentheses. Decision rule: To a Great Extent = 3.26–4.00; To Some Extent = 2.51–3.25; To a Little Extent = 1.76–2.50; Not at All = 1.00–1.75.

Hypothesis 1: AI literacy has no significant influence on AI usage among social studies pre-service teachers in Ogun State Colleges of Education.

Table 6 shows that AI literacy has a significant relationship with AI usage among social studies pre-service teachers in Ogun State Colleges of Education ($r = .777$, $df = 118$, $p < .05$). This implies that the respondents' AI literacy is significantly related to their use of AI tools, and that the level of AI literacy determines the extent to which they utilise such tools. Null hypothesis one was therefore rejected.

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Table 6

Pearson product-moment correlation between AI literacy and AI usage

Variable	N	Mean	S.D.	df	r	Sig.	Remark
AI literacy	120	24.812	3.678	118	0.777**	0.000	Significant
AI usage	120	23.608	4.275				

*Note. ** Correlation is significant at the 0.01 level (2-tailed).*

Hypothesis 2: AI self-efficacy has no significant influence on AI usage among social studies pre-service teachers in Ogun State Colleges of Education.

Table 7 reveals that AI self-efficacy has a significant relationship with AI usage among social studies pre-service teachers in Ogun State Colleges of Education ($r = .402$, $df = 118$, $p < .05$). This indicates that the respondents' level of AI self-efficacy influences the extent of their AI tool usage. Null hypothesis two was therefore rejected.

Table 7

Pearson product-moment correlation between AI self-efficacy and AI usage

Variable	N	Mean	S.D.	df	r	Sig.	Remark
AI self-efficacy	120	23.875	3.931	118	0.402**	0.000	Significant
AI usage	120	23.608	4.275				

*Note. ** Correlation is significant at the 0.01 level (2-tailed).*

Hypothesis 3: AI literacy and self-efficacy have no significant combined influence on AI usage among social studies pre-service teachers in Ogun State Colleges of Education.

Tables 8 and 9 present the combined influence of the independent variables (AI literacy and AI self-efficacy) on the dependent variable (AI usage). The result shows that the two variables jointly exert a significant influence on AI usage ($R = .780$, $R^2 = .608$). The adjusted R^2 value of .601 indicates that 60.1% of the variance in the respondents' AI tools usage is accounted for by the linear combination of the independent variables. The analysis of variance further confirms that the influence of the independent variables on the dependent variable is significant, $F(2, 117) = 90.713$, $p < .05$. Null hypothesis three was therefore rejected.

Table 8

Regression model summary for the joint influence of AI literacy and self-efficacy on AI usage

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.780	0.608	0.601	2.69942

Note. Predictors: (constant), AI literacy, AI self-efficacy. Dependent variable: AI usage.

Table 9

Analysis of variance for the regression model

Model	Sum of Squares	df	Mean Square	F	p	Remark
Regression	1322.030	2	661.015	90.713	0.000	Significant
Residual	852.562	117	7.287			
Total	2174.592	119				

Note. Significant at $p < .05$.

DISCUSSION

The first finding of the study revealed that the level of AI literacy among social studies pre-service teachers in Ogun State Colleges of Education was high. The majority of respondents understood the basic concept of artificial intelligence, were aware of the different AI tools available for learning and teaching, knew how AI tools generate information and responses, and understood the ethical issues involved in AI use in education. A large proportion could also use AI tools responsibly for academic purposes and knew how AI could be applied to lesson planning and instructional delivery. This finding aligns with Ayanwale et al. (2025), who reported that pre-service teachers

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exposed to AI-related workshops, coursework and guided practice demonstrated higher levels of AI literacy than those relying on self-directed exploration. It should be noted, however, that the result diverges from Amuda (2024), who reported moderate awareness but low functional AI literacy among pre-service teachers in a Federal College of Education in Ogun State, and from Ayanwale et al. (2024), who found that basic awareness of AI technologies frequently coexisted with limited conceptual knowledge of algorithms, data bias and ethical considerations. A plausible explanation for this divergence is the rapid diffusion of generative AI applications in the interval between those studies and the present one, which may have raised baseline familiarity; it is also possible that self-reported literacy overstates functional competence, a limitation to which the present measure is equally susceptible.

The second finding showed that the level of AI self-efficacy among the respondents was high. A large number were confident in their ability to learn how to use AI tools and felt confident using them to prepare assignments and projects. Many also indicated that they could use AI tools to support lesson preparation during teaching practice and felt capable of integrating AI tools into future classroom teaching, while the majority reported that they could overcome challenges encountered while using AI tools and use them responsibly without over-dependence. This result agrees with Zawacki-Richter et al. (2019), who found that learners demonstrate high self-efficacy in using AI tools owing to the increased integration of such technologies in education, and with Adedoyin and Soykan (2023), who reported that Nigerian students show a high level of confidence in adopting emerging educational technologies. It is further consistent with Bandura's (1997) position that repeated interaction with technological tools enhances individuals' self-efficacy through mastery experience.

The third finding indicated that social studies pre-service teachers in Ogun State Colleges of Education utilised AI tools only to some extent. The majority reported regular use of AI tools for studying and understanding course content and for searching for academic information and research materials. A good number used AI tools to assist in lesson planning and teaching preparation and to improve academic performance, and a large proportion used them during teaching practice or micro-teaching sessions and intended to continue using them in their future teaching career. This result is consistent with Adedoyin and Soykan (2023), who reported that students utilise digital tools to a moderate rather than extensive degree, and with Akgun and Greenhow (2022), who found that pre-service teachers use AI tools occasionally for academic purposes. Olasina (2019) similarly noted that while students frequently use digital technologies for personal and academic purposes, their use for instructional delivery remains limited. Notably, the coexistence of high literacy and self-efficacy with only moderate usage suggests that competence and confidence alone are insufficient; access, institutional support, and structured opportunities for practice appear to constrain fuller adoption. This interpretation is supported by Oyewole et al. (2026), who found that technological adaptation predicted inclusive teaching practices among social studies pre-service teachers in Ogun State, and by Jekayinfa et al. (2025), whose work on integrating AI into the teaching of family concepts demonstrates that subject-specific pedagogical application requires deliberate modelling rather than incidental exposure.

With respect to hypothesis one, AI literacy was found to exert a significant influence on AI usage, indicating that the level of AI literacy among social studies pre-service teachers determines the extent to which they utilise AI tools. This result is consistent with Long and Magerko (2020), who found that higher levels of AI literacy increase students' engagement with and use of AI tools. It also agrees with Ng (2012), who reported that digital literacy is a strong predictor of technology adoption among learners, and with Ayanwale et al. (2024), whose Nigerian sample showed that knowledge of AI concepts significantly predicted readiness to integrate AI into teaching practice. The finding corroborates Sanusi et al. (2024), who found that basic knowledge of AI was among the strongest determinants of Nigerian pre-service teachers' intention to learn AI, and extends that result by demonstrating that AI literacy is associated not only with intention but also with reported usage among social studies pre-service teachers in Ogun State.

Regarding hypothesis two, AI self-efficacy was found to have a significant influence on AI usage, indicating that the respondents' confidence in using AI tools shapes the extent of their usage. This finding agrees with Hoya et al. (2024), who established that self-efficacy and behavioural intention significantly predicted the frequency of AI use among pre-service teachers, and with Falebita and Kok (2024), who found that technological self-efficacy significantly determines students' usage of AI systems. It is further consistent with Oyewole and Jatau (2025), who reported that technological self-efficacy predicted AI usability for research among social sciences lecturers in Oyo State, suggesting that the influence of confidence on AI engagement operates similarly for teacher trainees and for practising academics. The comparatively weaker correlation observed for self-efficacy ($r = .402$) than for literacy ($r = .777$) suggests that knowledge of AI may play a more proximal role in usage decisions than confidence alone, a pattern consistent with Adigun and Miranda's (2025) observation that self-efficacy often operates indirectly through perceived usefulness and performance expectancy.

Finally, in respect of hypothesis three, AI literacy and self-efficacy jointly exerted a significant influence on AI usage, accounting for 60.1% of the variance in the respondents' use of AI tools. This implies that AI usage among social studies pre-service teachers in Ogun State Colleges of Education is significantly determined by the

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combination of their AI literacy and self-efficacy. The finding is in tandem with Long and Magerko (2020) and Akgun and Greenhow (2022), who reported that AI literacy combined with self-efficacy enhances engagement with AI tools. It also aligns with Teo (2011), who found that technological competence and self-efficacy jointly predict pre-service teachers' use of educational technologies. Read through the lens of the technology acceptance model, the result suggests that literacy raises perceived usefulness and lowers perceived complexity, while self-efficacy, consistent with social cognitive theory, sustains the persistence required to translate intention into actual use.

CONCLUSION

Artificial intelligence is reshaping education through personalised learning, improved assessment and enhanced instructional support, making digital competence essential for pre-service teachers. This study concludes that social studies pre-service teachers in Ogun State Colleges of Education possess a high level of AI literacy and a high level of AI self-efficacy, both of which are critical to their engagement with AI tools. Despite these high levels, their actual utilisation of AI tools remains moderate, suggesting that factors such as access, institutional support and practical exposure may be limiting fuller adoption. The findings further establish that AI literacy and AI self-efficacy significantly influence AI usage, both independently and jointly, indicating that pre-service teachers' knowledge of AI and their confidence in using it are key drivers of their engagement with AI technologies. Strengthening both constructs, while simultaneously addressing infrastructural and curricular constraints, is therefore central to preparing teachers for technology-driven classrooms.

Recommendations

Based on the findings of the study, the following recommendations are made:

1. Social studies pre-service teachers should actively use AI tools in academic activities such as assignments, research and private study in order to improve their familiarity, practical skills, AI literacy and self-efficacy.
2. Pre-service teachers should be educated on the ethical use of AI, including issues of academic integrity, data privacy and the critical evaluation of AI-generated content.
3. Lecturers should adopt supportive instructional methods such as guided practice, peer collaboration and continuous feedback to enhance students' AI self-efficacy.
4. Colleges of Education should provide hands-on training, workshops and classroom activities that encourage the active use of AI tools, thereby improving both competence and confidence.
5. Curriculum developers should design and incorporate AI literacy into teacher education and other academic programmes to strengthen students' understanding of AI tools and applications.
6. The National Commission for Colleges of Education (NCCE) and the National Universities Commission (NUC) should organise training for teacher educators on the effective use of AI tools, so that they can in turn support and motivate students in using such technologies.
7. Government and institutions should invest in digital infrastructure, including reliable internet access and AI-enabled learning platforms, to facilitate meaningful usage.

Acknowledgement

The authors sincerely thank the social studies pre-service teachers at Sikiru Adetona College of Education, Science and Technology, Omu-Ajose, and Federal College of Education, Osiele, Abeokuta, who gave their time to complete the questionnaire. The authors also thank the management and the Social Studies departments of both colleges for allowing access to their students. Thanks also go to the experts in social studies education and educational technology who validated the Questionnaire on AI Literacy, Self-Efficacy and AI Usage (QAILSAU), and to the trained research assistants who helped administer it. Finally, the authors acknowledge the researchers and institutions whose published work shaped this article.

Funding

This research received no external funding. No financial support was received from any public, commercial or not-for-profit organisation to conduct or prepare this article.

Ethical statement

This study was conducted in line with accepted ethical principles for research involving human participants. Before data collection, permission was obtained from the authorities of the two participating Colleges of Education. All respondents were told the purpose of the study. Participation was voluntary, and respondents could decline or withdraw at any time without any effect on their academic standing. Informed consent was obtained

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from every respondent before the questionnaire was given out. The questionnaire did not collect names or other identifying details. Responses were analysed only in aggregate and used solely for this research, so respondents stayed anonymous and their answers confidential throughout.

Competing interests

The authors declare that there are no competing interests regarding the publication of this paper.

Author contributions

Both authors contributed to the conceptualisation and design of the study, the literature review, the development and validation of the research instrument, data collection, statistical analysis and interpretation of the findings, and the preparation and revision of the manuscript. Both authors read and approved the final version of the manuscript.

Data Availability

The questionnaire data generated and analysed during this study are not publicly available, to protect the confidentiality of respondents. The anonymised dataset and the research instrument (QALSAU) are available from the corresponding author on reasonable request.

AI Disclosure

The authors declare that artificial intelligence (AI) tools were used solely to assist with language editing, grammar checking, and improving the clarity of the manuscript. AI tools were not used to generate, collect or analyse the research data, or to produce the statistical results reported in this study. All intellectual content, interpretation of the findings, arguments and conclusions remain the sole responsibility of the authors.

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REFERENCES

Adedoyin, O. B., & Soykan, E. (2023). Covid-19 pandemic and online learning: The challenges and opportunities. *Interactive Learning Environments, 31*(2), 863–875. https://doi.org/10.1080/10494820.2020.1813180

Adigun, C. J., & Miranda, J. C. (2025). Artificial intelligence in the Philippine educational context: Circumspection and future inquiries. *International Journal of Scientific and Research Publications, 13*(4), 16–24.

Akgun, S., & Greenhow, C. (2022). Artificial intelligence in education: Addressing ethical challenges in K-12 settings. *AI and Ethics, 2*(3), 431–440. https://doi.org/10.1007/s43681-021-00096-7

Amuda, J. M. R. (2024). Artificial intelligence (AI) literacy and academic performance of tertiary level students: A preliminary analysis. *Social Sciences, Humanities and Education Journal (SHE Journal), 5*(2), 309–321.

Ayanwale, M. A., Frimpong, E. K., Opesemowo, O. A. G., & Sanusi, I. T. (2025). Exploring factors that support pre-service teachers' engagement in learning artificial intelligence. *Journal for STEM Education Research, 8, 199-229 (2025).* https://doi.org/10.1007/s41979-024-00121-4

Ayanwale, M. A., Molefi, R. R., & Matsie, N. (2024). Modelling secondary school students' attitudes toward teaching–learning mechanisms of artificial intelligence. *Computers and Education: Artificial Intelligence, 6*, Article 100200. https://doi.org/10.1016/j.caeai.2024.100200

Baker, T., & Smith, L. (2019). *Educ-AI-tion rebooted? Exploring the future of artificial intelligence in schools and colleges*. Nesta.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman.

Celik, I. (2023). Towards Intelligent-TPACK: An empirical study on teachers' professional knowledge to ethically integrate artificial intelligence (AI)-based tools into education. *Computers in Human Behavior, 138*, Article 107468. https://doi.org/10.1016/j.chb.2022.107468

Compeau, D. R., & Higgins, C. A. (1995). Computer self-efficacy: Development of a measure and initial test. *MIS Quarterly, 19*(2), 189–211. https://doi.org/10.2307/249688

Dai, Y., Chai, C. S., Lin, P.-Y., Jong, M. S.-Y., Guo, Y., & Qin, J. (2020). Promoting students' well-being by developing their readiness for the artificial intelligence age. *Sustainability, 12*(16), Article 6597. https://doi.org/10.3390/su12166597

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly, 13*(3), 319–340. https://doi.org/10.2307/249008

Dergaa, I., Chamari, K., Zmijewski, P., & Ben Saad, H. (2023). From human writing to artificial intelligence generated text: Examining the prospects and potential threats of ChatGPT in academic writing. *Biology of Sport, 40*(2), 615–622. https://doi.org/10.5114/biolsport.2023.125623

Falebita, O. S., & Kok, P. J. (2024). Artificial intelligence tools usage: A structural equation modeling of undergraduates' technological readiness, self-efficacy and attitudes. *Journal for STEM Education Research*. https://doi.org/10.1007/s41979-024-00132-1

Holmes, W., Bialik, M., & Fadel, C. (2019). *Artificial intelligence in education: Promises and implications for teaching and learning*. Center for Curriculum Redesign.

Jekayinfa, J. R., Egbetola, O. T., & Oyewole, O. (2025). Integrating AI in teaching family concepts in schools in Nigeria. *International Journal of Interdisciplinary and Current Studies in Education, 2*, 315–328.

Long, D., & Magerko, B. (2020). What is AI literacy? Competencies and design considerations. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems* (pp. 1–16). Association for Computing Machinery. https://doi.org/10.1145/3313831.3376727

Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson.

Ng, D. T. K., Leung, J. K. L., Chu, S. K. W., & Qiao, M. S. (2021). Conceptualizing AI literacy: An exploratory review. *Computers and Education: Artificial Intelligence, 2*, Article 100041. https://doi.org/10.1016/j.caeai.2021.100041

Ng, W. (2012). Can we teach digital natives digital literacy? *Computers & Education, 59*(3), 1065–1078. https://doi.org/10.1016/j.compedu.2012.04.016

Ogundipe, O. G., & Oyewole, O. (2025). Technological proficiency and virtual collaboration as predictors of global adaptability among social studies pre-service teachers in Oyo State, Nigeria. *African Journal of Social and Behavioural Sciences, 15*(1), 166–178.

Olasina, G. (2019). Human and social factors affecting the decision of students to accept e-learning. *Interactive Learning Environments, 27*(3), 363–376. https://doi.org/10.1080/10494820.2018.1474233

Oyewole, O., Adediran, Y. O., & Edewor, K. O. (2026). Technological adaptation and classroom diversity as predictors of inclusive teaching practices among social studies pre-service teachers in Ogun State. *Ibadan Journal of Child Development and Educational Foundations, 6*(1), 125–140.

Oyewole, O., & Jatau, S. N. (2025). Technological self-efficacy and online database access as predictors of AI usability for research among social sciences lecturers in Oyo State. *Wukari International Studies Journal, 9*(1), 210–221.

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Sanusi, I. T., Ayanwale, M. A., & Tolorunleke, A. E. (2024). Investigating pre-service teachers' artificial intelligence perception from the perspective of planned behavior theory. *Computers and Education: Artificial Intelligence, 6*, Article 100202. https://doi.org/10.1016/j.caeai.2024.100202

Teo, T. (2011). Factors influencing teachers' intention to use technology: Model development and test. *Computers & Education, 57*(4), 2432–2440. https://doi.org/10.1016/j.compedu.2011.06.008

UNESCO. (2023). *Guidance for generative AI in education and research*. https://doi.org/10.54675/EWZM9535

UNESCO. (2024). *AI competency framework for teachers*. https://doi.org/10.54675/ZJTE2084

Venkatesh, V., Morris, M. G., Davis, G. B., & Davis, F. D. (2003). User acceptance of information technology: Toward a unified view. *MIS Quarterly, 27*(3), 425–478. https://doi.org/10.2307/30036540

Wang, Y.-Y., & Chuang, Y.-W. (2024). Artificial intelligence self-efficacy: Scale development and validation. *Education and Information Technologies, 29*(4), 4785–4808. https://doi.org/10.1007/s10639-023-12015-w

Zawacki-Richter, O., Marín, V. I., Bond, M., & Gouverneur, F. (2019). Systematic review of research on artificial intelligence applications in higher education – Where are the educators? *International Journal of Educational Technology in Higher Education, 16*, Article 39. https://doi.org/10.1186/s41239-019-0171-0

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