International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/

Vol. 58 No. 2 August 2026, pp. 685-699

Relationship Between Teachers' Self-Efficacy And Their Use Of Ai-Based Assessment In Public Secondary Schools In Adamawa State, Nigeria

[1]OWONWAMI Isiaka Taiye, [2]FARANSA Babale Danan, [3]SAKIYO John, [4]YAKUBU Saratu

[1,2,3]Department of Educational Foundations, Faculty of Education

Modibbo Adama University, Yola, Adamawa State, Nigeria & Department of Educational Foundation University of Abuja, Nigeria

Corresponding author : OWONWAMI Isiaka Taiye, owonwami@mau.edu.ng

+2347069541962

Abstract: This study investigated the relationship between teachers' self-efficacy and their use of AI-based assessment among public secondary school teachers in Adamawa State, Nigeria. The study was anchored on five objectives and four hypotheses on technological self-efficacy, instructional self-efficacy, assessment self-efficacy and the combined effect of teachers' self-efficacy on AI-based assessment usage respectively. Social Cognitive Theory by Bandura formed the framework for this study in recognition of self-efficacy as an important determinant of behavior and technology adoption. The ex post facto research design was used in the conduct of this study. The population for the study consisted of about 1,050 Mathematics and Science teachers in public secondary schools in Adamawa State. The sample for the study was drawn from the population using multi-stage sampling techniques and consisted of 200 teachers. Two validated instruments; the Teacher Self-Efficacy Scale (TSES) and AI-based Assessment Usage Questionnaire (AIAUQ) were used to collect data. The reliability of the instruments is 0.84 and 0.86 respectively, indicating high internal consistency. Data were analyzed using descriptive statistics, Pearson Product Moment Correlation and multiple regressions at 0.05 level of significance were employed. The results indicated that teachers had relatively high levels of self-efficacy in technological (M=3.09), instructional (M=3.11) and assessment domains (M=3.04). A statistically significant positive correlation was established between technological self-efficacy ($r = 0.62$), instructional self-efficacy ($r = 0.68$), and assessment self-efficacy ($r = 0.59$) and AI-based assessment use ($p < 0.05$). In addition, multiple regression analysis indicated that the cumulative effect of teachers' self-efficacy had a significant prediction on AI-based assessment use ($R = 0.74$, $R^2 = 0.55$, $F(3,196) = 79.12$, $p < 0.05$), with technological self-efficacy being the most significant predictor. In conclusion, the study finds that teachers' self-efficacy is a significant predictor of teachers' use of AI-based assessment. The study recommends continued professional development and improvement of ICT infrastructure and training for teachers to increase their self-efficacy in AI-based assessment in secondary schools.

Keywords: **Self-efficacy, Artificial Intelligence, AI-based assessment, technological self-efficacy, instructional self-efficacy, assessment self-efficacy**

International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/
Vol. 58 No. 2 August 2026, pp. 685-699

1.1 Introduction

The implementation of AI in the field of education has changed teaching, learning, and assessment process worldwide. AI is the term denoting computer systems and technologies that are able to perform tasks that traditionally are performed by humans and include learning, reasoning, problem-solving, decision-making, and data analysis. In the field of education, there has been observed an increased use of AI technologies for instructional delivery, classroom management, and assessment process. From among all of these innovations, AI-based assessment is one of the most important developments that have allowed teachers to assess their students' learning effectively. AI-based assessment represents an approach to assessment that utilizes intelligent systems, machine learning algorithms, automated grading systems, learning analytics, adaptive tests, and generative AI systems to conduct assessment process of students' performance. There are many advantages of using AI-based assessment including provision of timely feedback, reduction of workload related to assessment process, increase of objectivity, improvement of monitoring of students' progress, and making evidence-based instructional decisions (Chiu, Ahmad, & Çoban, 2025; Ofem et al., 2025).

Educational organizations around the world are progressively adopting AI-based solutions to enhance assessment processes and improve educational outcomes. Increasingly complex education systems along with increasing demands for personalized learning have made necessary the use of innovative tools capable of analyzing performance data and providing personalized recommendations. AI-based assessment has proved to be effective in conducting both formative and summative assessment via automated scoring, plagiarism detection, predictive analysis, and personalized feedback. As a result, governments, educational organizations, and educational establishments are launching digital transformation projects, which imply integration of AI into education processes. Nonetheless, the successful adoption of AI-based assessment requires not only the existence of technical opportunities but also teachers' preparedness, proficiency, and confidence in implementing such solutions.

One of the most significant variables affecting the adoption and usage of educational technologies is self-efficacy. The notion of self-efficacy was proposed by Bandura (1997) as an individual's perception of his or her own ability to organize and perform certain actions necessary to achieve certain results. In the field of education, self-efficacy of teachers is defined as an ability of teachers to successfully accomplish teaching-related tasks and impact the academic performance of students. Teachers who have high self-efficacy show greater perseverance, enthusiasm, flexibility, and openness to use innovative teaching methods. Such teachers are open to changes associated with introduction of technology in education and are eager to try new methods of instruction and testing. On the contrary, teachers with low self-efficacy usually feel anxiety and uncertainty concerning new educational trends,

and therefore do not promote effective implementation of technology in schools.

Recently conducted research has proved the role of self-efficacy of teachers in their attitude towards adoption and use of AI. According to Chiu et al. (2025), teachers with high AI competence self-efficacy are willing to incorporate AI solutions into their teaching and testing process. The same was found by Mah and Groß (2024): the higher level of self-efficacy, the higher willingness to use AI and to be involved in AI-supported activities. Thus, self-efficacy of teachers has a direct effect on their intention to adopt AI-based testing tools.

Of many dimensions of teacher self-efficacy, technological self-efficacy is an especially critical one in the case of AI-assessment. Technological self-efficacy means teachers' belief in their competence to control and operate technological instruments appropriately in the process of education. Teachers with strong technological self-efficacy tend to discover and use technological tools like AI-assessment systems, automated grading, learning management system and data analytics tools. They have the ability to address technical problems, learn how to use new applications and apply technological innovations in practice. Conversely, those teachers who have a weak level of technological self-efficacy are likely to consider AI applications complicated and thus

refrain from using them at all. According to Chiu, Ahmad, and Çoban (2025), teachers who are confident about their AI and digital skills are more ready to use AI technologies in educational processes including such tasks as automated grading and feedback generation. At the same time, Du et al. (2024) found out that AI literacy contributes to technological self-efficacy of teachers, thereby making them ready to use AI tools in practice. Likewise, Adigun et al. (2025) found in the Nigerian setting that the digital competence and technological confidence of teachers considerably impact their willingness to adopt AI in classroom assessment. These studies prove that teachers cannot be expected to adopt AI assessment tools successfully without sufficient technological self-efficacy due to their fears, low level of confidence and inadequate digital skills.

Another important component of teacher self-efficacy concerning AI-assessment is instructional self-efficacy. Instructional self-efficacy means the extent to which teachers feel confident about planning, organizing, and conducting instructional processes for effective learning. When teachers are working in an environment where AI technology is used for assessment, instructional self-efficacy affects the way teachers can use AI-generated feedback to plan lessons, adjust their teaching methods according to assessment data and employ AI tools for personalized learning of students. In this case, they are less likely to consider AI as an instructional tool but rather a substitute for human judgement. Nevertheless, those educators who do not have high instructional self-efficacy can hardly understand the AI feedback or use the results of assessments in instructional process. In turn, according to the study by Mah and Groß (2024), teachers with high instructional self-efficacy can take advantage of the AI feedback in order to make their lessons more effective and instructional decisions more relevant. Furthermore, it was proved by Erol (2025) that the instructional self-efficacy is one of the factors which is significantly correlated with the teachers' attitude towards AI and its implementation in the pedagogical and assessment processes. Ofem et al. (2025) mentioned that teachers' pedagogical beliefs and instructional self-efficacy affect their willingness to use AI-assessment systems.

The next component of teacher self-efficacy that is directly associated with the application of AI-based assessment is assessment self-efficacy. It is defined as teachers' confidence in their capability to conduct assessment procedures effectively. The development of AI-based assessment calls for the competency of teachers to assess the validity, reliability, fairness, and appropriateness of the AI-produced results of assessments. The teachers with high assessment self-efficacy have a tendency to use AI technology to construct tests, conduct automated scoring, generate feedback, and analyze the performance of learners. These teachers can make reasonable decisions concerning the choice and application of assessment techniques supported by AI technologies. On the contrary, the teachers who have lower assessment self-efficacy may doubt the validity of AI-generated results. As a result, they may refuse from using these technologies. It was revealed by Chou et al. (2024) that teachers with high confidence in the assessment procedures tend to use AI technologies for grading, evaluating, and providing feedback. Likewise, according to the findings of Ofem et al. (2025), teachers' confidence in assessment has a great effect on their willingness to use AI-based of AI-based assessment tools. According to Guo, Shi, and Zhai (2024), self-efficacy, particularly design self-efficacy, interpretation self-efficacy, and management self-efficacy, is also significantly predicted by assessment-related factors, such as perceived usefulness and assessment confidence. All in all, the aforementioned studies provide evidence for the relationship between self-efficacy and teachers' acceptance of AI-based assessment tools.

The role of the above-discussed components of self-efficacy is even more significant in developing countries, such as Nigeria, where there are certain difficulties regarding the integration of technological innovations in the process of education. Despite the fact that Nigeria has implemented different initiatives to encourage ICT use in education, many public secondary schools suffer from the lack of necessary digital infrastructure, poor internet connectivity, technological resources, and teacher training. The discussed problems occur quite often in Adamawa State, Nigeria. Hence, teachers may lack confidence and skills needed to use AI-based assessment tools.

Public secondary schools in Adamawa state play a key role in ensuring that the students are prepared for national development and competition in the global world. The increasing need for technology-based teaching and assessment procedures have brought forth a number of challenges, such as teachers' readiness to use the new innovative technology. Although AI-based assessment

technologies can be useful in enhancing the quality and efficiency of assessments in addition to providing personalized services, effective implementation of these technologies requires teachers' self-efficacy in using technology, instruction, and assessment processes.

Several challenges related to low self-efficacy of teachers in using AI-based assessment technologies have been noted. They include technology anxiety, resistance to innovations, lack of ability to interpret the results produced by the AI-based systems, ineffective use of AI-based technologies, and concerning their participation in professional development programs. Challenges may also arise in relation to ethical issues, privacy of data, algorithms bias, and academic integrity for the teachers making use of AI-supported assessment systems. These challenges will negatively impact the teachers' intention to use AI technologies in education assessment. Several studies have indicated that low self-efficacy results in low levels of technology acceptance and lack of innovations in the teaching and assessment process (Mah & Groß, 2024; Ofem et al., 2025).

Although artificial intelligence is gradually gaining popularity in the field of education, very few empirical studies have been carried out to explore the link between teachers' self-efficacy and their use of AI-supported assessment in Nigerian secondary schools. Most studies in literature have concentrated on the awareness of AI, digital literacy, acceptance of technology, and attitude towards AI while few studies have explored the effect of particular self-efficacy components like technological self-efficacy, instructional self-efficacy, and assessment self-efficacy on teachers' use of AI-supported assessment tools. This is even more prevalent in Adamawa state, where no empirical study has been carried out on the role of teachers' beliefs about themselves in the adoption and use of AI assessment technologies.

Thus, it becomes necessary to conduct a study on the association between the self-efficacy of the teachers and their implementation of AI assessment in public secondary schools within Adamawa State, Nigeria. Particularly, the research will examine the importance of technological self-efficacy, instructional self-efficacy, and assessment self-efficacy as key areas which can have an impact on the adoption and implementation of AI assessment. The results of the research will be significant for the development of interventions to enhance the self-efficacy of the teachers for effective adoption of AI assessment in secondary schools.

1.1.1 Research Objectives

The main objective of this study is to examine the relationship between teachers' self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State, Nigeria.

Specifically, the study seeks to:

1. Determine the relationship between technological self-efficacy and teachers' use of AI-based assessment.
2. Examine the relationship between instructional self-efficacy and teachers' use of AI-based assessment.
3. Assess the relationship between assessment self-efficacy and teachers' use of AI-based assessment.
4. Determine the relationship between teachers' self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State, Nigeria.
5. Examine the extent to which teachers use AI-based assessment in public secondary schools in Adamawa State, Nigeria

1.1.2 Research Questions

The following research questions guided the study:

1. What is the relationship between teachers' technological self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State?
2. What is the relationship between teachers' instructional self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State?
3. What is the relationship between teachers' assessment self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State?
4. What is the relationship between teachers' self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State, Nigeria?
5. What is the extent of teachers' use of AI-based assessment in public secondary schools in Adamawa State, Nigeria?

1.1.3 Research Hypotheses

The following null hypotheses were formulated and tested at 0.05 level of significance**:**

H_{01}: There is no significant relationship between teachers' technological self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State.

H_{02}: There is no significant relationship between teachers' instructional self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State.

H_{03}: There is no significant relationship between teachers' assessment self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State.

H_{04}There is no significant relationship between teachers' self-efficacy (teachers' technological self-efficacy, teachers' instructional self-efficacy and teachers' assessment self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State, Nigeria

2.1 Theoretical Framework:

2.1.1 Social Cognitive Theory of Albert Bandura

This study is built on Social Cognitive Theory of Albert Bandura (1997). The theory states that human behavior is a dynamic process that emerges through the interplay between individual characteristics, environment, and behavior itself. The main idea of the Social Cognitive Theory is that people are not passive agents who accept environmental stimuli but active interpreters of experience and regulators of their behavior according to perceived competences. Self-efficacy is one of the key elements of the SCT. Self-efficacy is defined as an individual's confidence in his/her capacity to successfully accomplish certain actions. According to Bandura, self-efficacy affects motivation, perseverance, emotional responses, and actions of individuals. High self-efficacy means that people will be ready to take up challenges, persevere and use innovations. On the other hand, low self-efficacy means that individuals will try to avoid complex tasks and changes.

2.1.2 Technological Self-Efficacy

In the context of this theoretical model, the concept of technological self-efficacy is viewed as the perception of teachers on their competence in using technology for educational and assessing purposes. For AI assessments, technological self-efficacy refers to the perception of teachers on their abilities to work with automated assessment and grading systems, learning analytics systems, and adaptive assessments. Research demonstrates that digital self-efficacy greatly impacts the interaction between teachers and AI tools and educators' readiness to adopt these tools in the classroom (Ren et al., 2025). Consequently, teachers with high self-efficacy will be more inclined to use AI tools and systems.

2.1.3 Instructional self-efficacy,

Instructional self-efficacy in the context of SCT is the teachers' confidence in their capacity to develop, arrange, and implement appropriate instructional techniques to improve the learning outcomes of students. Instructional self-efficacy guides the interpretation by teachers of environmental information and its transformation into instructional practices. In the case of AI-based assessment practices, instructional self-efficacy guides the ways in which teachers can use AI-based feedback to change their teaching approaches and differentially instruct learners. Research literature shows that the role of teacher self-efficacy is crucial for the successful adoption of AI to inform teachers' decisions because it enables teachers to interpret the insights generated by AI technologies (Mah & Groß, 2024; Ofem et al., 2025).

2.1.4 Assessment self-efficacy

Assessment self-efficacy can be defined as confidence in the ability of educators to design, deliver, interpret and utilize information collected through assessment. In AI-assisted assessment systems, it includes the ability to interpret scores generated by AI, analyze learning analytics and assess the accuracy of results generated by an AI system. According to SCT, individuals with high self-efficacy are more prone to participating in challenging cognitive activities and using innovative means. The recent research demonstrates that AI self-efficacy considerably impacts teachers' acceptance and utilization of AI-assisted assessment systems in situations where trust in automated assessment is needed (Chou et al., 2024; Rajapakse et al., 2024). Therefore, teachers with high assessment self-efficacy will more easily trust results generated by an AI and use them in teaching decisions while individuals with low assessment self-efficacy may doubt the accuracy of such results.

Social Cognitive Theory developed by Bandura offers an excellent explanation of teachers' adoption of AI-assisted assessment. It states that behavior is controlled by self-efficacy beliefs, and in this study These are measured in terms of technological, instructional and assessment self-efficacies. The technological self-efficacy dictates how the teachers will use the AI systems, the instructional self-efficacy indicates how the teachers will use the feedback from the assessments, while the assessment self-efficacy dictates how much the teachers trust the feedback generated by the AI systems.

2.1.5 AI-Based Assessment

AI-based assessment involves applying technologies such as machine learning, natural language processing, and learning analytics to create, deliver, score, and give feedback about students' learning outcomes. It implies an evolution from paper-based or manually scored assessments to more automated and adaptive ways of assessing learners' performance in education. Current research indicates that the integration of AI into educational assessments provides higher efficiency, objectivity, and quality of feedback in teaching and learning processes. Artificial intelligence systems can be utilized for automatic grading, formative assessment and feedback, thus freeing up time of instructors for instructional development. They can be used in personalized assessment and adapt tasks according to the level of competence of learners and their performance monitoring (Zulpykhar et al., 2026; Sun & Tian, 2026). Besides, one of the main benefits of AI-based assessments is that they improve formative assessments due to their immediate feedback and ability to detect deficiencies in students' performance more effectively than traditional ways (Bashraheel & Ghinea, 2026; Caspari-Sadeghi, 2022).

3.1 METHODOLOGY

An ex post facto research design was employed in this study. This design was chosen because the study seeks to examine naturally existing phenomena without manipulating any variables. It is mostly used in educational research where the independent variables that occurred prior to the conduct of the study cannot be manipulated by the researcher. In this study, the independent variables which include teachers' self-efficacy (technological, instructional and assessment self-efficacy) and their application of

artificial intelligence-based assessment was examined. Ex post facto designs are applicable in the examination of variables relationships since experimental manipulation of the variables is not possible, according to Creswell and Creswell (2023). This study was carried out in Adamawa State, Nigeria, in the North-East geopolitical zone.

The population of this study was all the Mathematics and Science teachers in the public secondary schools in Adamawa State, Nigeria. The number of these teachers in the study population was approximately 1,050, found in the three educational zones in Adamawa State. Zone A had about 360 teachers, Zone B had 350 teachers while Zone C had 340 teachers, giving a total of 1,050 teachers. These types of teachers were chosen because Mathematics and Science Subjects are closer to structured lessons, decision making based on data and technological enhanced assessment and therefore fit for the study of the use of AI in assessment practices (Fraenkel, Wallen, & Hyun, 2023).

For the study, 200 Math and Science teachers formed the sample size out of the entire population. The sample size was calculated using the Taro Yamane (1967) formula which produced an even bigger sample size but finally the sample size was reduced to 200 to make it more feasible in terms of time, costs and accessibility purposes but enough for correlation analysis statistically.

Multistage sampling method was used in choosing the respondents for the study. Firstly, the whole population was divided into strata based on the three educational zones in Adamawa state (Zone A, Zone B and Zone C). Secondly, proportionate sampling was done within each stratum. Finally, simple random sampling method was done by selecting math and science teachers from the chosen schools. The sample size of 200 used for this study comprised 69 teachers from zone A, 67 teachers from zone B, and 64 teachers from zone C, totaling 200 respondents. Approximately 6–8 teachers from each school participated in this research depending on the availability of Mathematics and Science teachers per each public secondary school. In other words, the distribution of teachers for this study was fairly proportional across all three zones, with no zone being underrepresented (Creswell & Creswell, 2023; Fraenkel, Wallen, & Hyun, 2023).

Two structured instruments were created by the researcher to collect data from teachers at public secondary schools in Adamawa State, Nigeria. They include Teachers' Self-Efficacy Scale (TSES) and AI-Based Assessment Usage Questionnaire (AIAUQ). Both instruments are designed to identify and measure self-efficacy of teachers and their real usage of AI-based assessment tools. The application of structured questionnaires in educational studies is appropriate since it enables researchers to gather standardized responses from large samples of participants regarding beliefs, attitudes, technology use, and many other topics (Dörnyei & Dewaele, 2022).

The Teachers' Self-Efficacy Scale (TSES) was created to assess the teachers' sense of competence in accomplishing tasks that relate to teaching, covering three domains such as technological self-efficacy, instructional self-efficacy, and assessment self-efficacy. The test is an organized questionnaire with a Likert-type rating scale. Teachers had to indicate how much they agreed with the statements. The values of the scale vary from Strongly Agree (4) to Agree (3), Disagree (2), and Strongly Disagree (1). Such approach enables the researcher to estimate the level of teachers' beliefs and turn them into numerical data that could be analyzed statistically. The statements cover teachers' self-belief in using digital technologies, instructional abilities and conducting assessments and interpreting the results of assessment tasks.

The AI-Based Assessment Usage Questionnaire (AIAUQ) was created to evaluate the frequency of using AI-based assessment tools by teachers during their instructions. The test is also structured with a four-point Likert type rating scale (Strongly Agree to Strongly Disagree). The tool concentrated on the degree of use of the AI-based assessment tools by the teachers, including automated scoring systems, learning analytics systems, adaptive assessment tools, among other digital tools used for assessment purposes. The questions measured the awareness and the use of the digital assessment tools by the teacher participants, which enabled the researcher to generate measurable data concerning technology adoption behavior.

International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/
Vol. 58 No. 2 August 2026, pp. 685-699

Both the TSES and the AIAUQ tools were validated using face and content validation methods involving experts in Educational Psychology, Measurement and Evaluation and Educational Technology fields. This enabled the researcher to ensure the validity and relevance of the items as well as the construct measurement of the tool. Expert judgment is the most acceptable means of validating research instruments in education research (Taherdoost, 2021).

The reliability of the TSES and the AIAUQ was measured using Cronbach's Alpha through the pilot testing process outside the main sample. The TSES provided reliability coefficients of 0.82 (Technological Self-Efficacy), 0.85 (Instructional Self-Efficacy), and 0.83 (Assessment Self-Efficacy) with an overall reliability index of 0.84 for the independent variable. (teachers' self-efficacy). Reliability coefficients ranging from 0.70 to 0.90 were obtained for each of the tools, thus confirming the reliability of the instruments (AIAUQ – 0.86; SAQ – 0.80). Since the values exceed the acceptable value of 0.70, the research instruments can be viewed as reliable in the current context (Taber, 2021). The researcher administered the questionnaires in person with the assistance of research assistants. Such an approach is suggested in survey research as a means of increasing the response rate and reducing the issue of non-response bias (Creswell & Creswell, 2023).

The collected data were analyzed using both descriptive and inferential statistics. In particular, mean and standard deviation were used to describe and summarize the data provided by the respondents, whereas Pearson Product-Moment Correlation (PPMC) was utilized to test the hypotheses 1-3, and multiple linear regression for hypothesis 4 in order to determine predict teachers' self-efficacy and their use of AI-based assessment. All hypotheses were tested at a 0.05 level of significance. Pearson correlation was deemed suitable due to measuring relationship between continuous variables (Pallant, 2020). In accordance with the decision rule, the null hypothesis was accepted if the p-value exceeded 0.05 and not accepted if the p-value was less than 0.05, which is typical for inferential statistical analysis in social sciences (Field, 2022).

4.1 Results

4.1.1 Answering of Research Questions

Research Question One: What is the relationship between teachers' technological self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State?

Table 1: Teachers' Technological Self-Efficacy and Their Use Of AI-Based Assessment

S/N	Items n= 200	Mean	Std. Deviation	Decision
1	I can use digital tools to support assessment tasks effectively	3.21	0.78	Agree
2	I can operate AI-based grading systems with ease	3.05	0.81	Agree
3	I can interpret results from learning analytics tools	3.10	0.75	Agree
4	I can troubleshoot minor technical issues in AI assessment tools	2.98	0.83	Agree
	Grand Mean	**3.09**	**0.79**	**Agree**

As can be seen from the results presented in Table 1, there is a high degree of technological self-efficacy among teachers concerning the application of AI-assessment, as the grand mean equals 3.09 (SD = 0.79). In other words, most teachers have enough confidence in their ability to work with digital technologies and AI-assessment systems. The highest mean score was

achieved for the use of digital tools for assessing students' works (M = 3.21), which demonstrates high self-confidence regarding digital competencies. Moreover, teachers showed a positive ability to interpret learning analytics (M = 3.10) and operate AI-based grading systems (M = 3.05).

Research Question Two: What is the relationship between teachers' instructional self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State?

Table 2: Teachers' Instructional Self-Efficacy and Their Use of AI-Based Assessment

S/N	Items	Mean	Std. Deviation	Decision
1	I can use AI feedback to improve my lesson delivery	3.18	0.74	Agree
2	I can adjust my teaching strategies based on assessment results	3.12	0.76	Agree
3	I can integrate AI-generated feedback into classroom instruction	3.00	0.80	Agree
4	I can design lessons based on students' assessment performance	3.15	0.72	Agree
	Grand Mean	**3.11**	**0.76**	**Agree**

As seen from Table 2, there is a high instructional self-efficacy among teachers in the application of AI-based assessment, which has been demonstrated by the grand mean score of 3.11 (SD = 0.76). This implies that teachers are capable of utilizing the information in the process of improving their instruction. The highest mean score is on the utilization of AI feedback to enhance instruction (M = 3.18), while the lowest mean score is on the integration of AI feedback into classroom instruction (M = 3.00).

Research Questions Three: Relationship between Teachers' Assessment Self-Efficacy and AI-Based Assessment Use

Table 3: Teachers' Assessment Self-Efficacy and their Use Of AI-Based Assessment

S/N	Items	Mean	Std. Deviation	Decision
1	I can design valid assessments using digital tools	3.08	0.77	Agree
2	I can interpret AI-generated assessment results accurately	3.02	0.82	Agree
3	I can trust automated grading systems for evaluation	2.95	0.84	Agree
4	I can use AI assessment data to evaluate student performance	3.10	0.75	Agree
	Grand Mean	**3.04**	**0.80**	**Agree**

The analysis from Table 3 reveals that the level of self-efficacy of the teachers towards AI-based assessment is quite high, with a grand mean score of 3.04 (SD = 0.80). The most mean score obtained is in the use of AI assessment data in assessing students' performance (M = 3.10), then followed by designing valid assessments using digital technology (M = 3.08). In addition, the teachers were also efficacious in interpreting the AI results (M = 3.02). On the other hand, the least mean score obtained is in trusting the automated grading system (M = 2.95).

Research Question Four: What is the relationship between teachers' self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State, Nigeria?

Table 4: teachers' self-efficacy and their use of AI-based assessment

S/N	Variables	Mean	Std. Deviation	Decision
1	Technological Self-Efficacy	3.09	0.79	Agree
2	Instructional Self-Efficacy	3.11	0.76	Agree
3	Assessment Self-Efficacy	3.04	0.80	Agree
	Grand Mean	**3.08**	**0.78**	**Agree**

Table 4 reveals that teachers are endowed with a fairly high level of self-efficacy concerning the three factors, with a grand mean of 3.08 (SD = 0.78), meaning that there is a high degree of consistency regarding their level of self-confidence. Out of all the variables, instructional self-efficacy scored the highest mean (M = 3.11), followed by technological self-efficacy (M = 3.09), whereas assessment self-efficacy obtained the lowest mean (M = 3.04). This implies that teachers are more confident when performing instructional tasks than technological and assessment-oriented tasks.

Research Question Five: To what extent do teachers utilize AI-based assessment in public secondary schools in Adamawa State, Nigeria?

Table 5: utilization of AI-based assessment by teachers in public secondary schools in Adamawa State, Nigeria

S/N	Items	Mean	Std. Deviation	Decision
1	I use AI tools for grading students' assignments	2.90	0.85	Agree
2	I use learning analytics to track students' performance	3.00	0.79	Agree
3	I use AI platforms to give feedback to students	3.05	0.76	Agree
4	I frequently integrate AI-based assessment tools in teaching	2.88	0.83	Agree
	Grand Mean	**2.96**	**0.81**	**Agree**

Table 5 indicates that teachers in public secondary schools in Adamawa State utilize AI-based assessment moderately with a grand mean of 2.96 (SD = 0.81). This suggests overall agreement on the usage of AI in assessing students. The most used type of AI application is feedback provision using AI technology (M = 3.05), followed by monitoring the performance of the students using learning analytics (M = 3.00). However, the lowest types of usage include grading students using AI (M = 2.90) and frequently incorporating AI in teaching (M = 2.88).

4.1.2 Hypotheses

H_{01}: There is no significant relationship between teachers' technological self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State

Table 6: Relationship between Teachers' Technological Self-Efficacy and Their Use of AI-Based Assessment

Variables	n	Mean	Std. Deviation	r-value	p-value	Decision
Technological Self-Efficacy	200	3.09	0.79			
AI-Based Assessment Usage	200	2.96	0.81	0.62	0.000	Significant

The Pearson Product-Moment Correlation test result indicated that there is a moderately strong and significant relationship between teachers' technological self-efficacy and their usage of AI-based assessments ($r = 0.62$, $p = 0.000 < 0.05$). As the p-value is less than 0.05, the null hypothesis is rejected. It means that those teachers who possess higher levels of technological self-efficacy are more prone to using AI-based assessments in their teaching practice.

H02: There is no significant relationship between teachers' instructional self-efficacy and their usage of AI-based assessments in public secondary schools in Adamawa State.

Table 7: Teachers' Instructional Self-Efficacy and their Use of AI-Based Assessment in Public Secondary Schools in Adamawa State

Variables	n	Mean	Std. Deviation	r-value	p-value	Decision
Instructional Self-Efficacy	200	3.11	0.76			
AI-Based Assessment Use	200	2.96	0.81	**0.68**	**0.000**	Significant

As shown in Table 7, the finding demonstrates that there is a positive and significant relationship between instructional self-efficacy of the teachers and their use of AI-based assessment in the public secondary schools in Adamawa State ($r = 0.68$, $p = 0.000 < 0.05$). This means that the teachers with high self-confidence regarding their instructional skills are better at using AI-based assessment tools in their teaching processes. As the p-value is smaller than the significance level (0.05), the null hypothesis can be rejected. It means that the instruction self-efficacy significantly impacts the use of AI-based assessment by teachers.

H03: There is no significant relationship between teachers' assessment self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State.

Table 8: Table Teachers' Assessment Self-Efficacy And Their Use of AI-Based Assessment in Public Secondary Schools in Adamawa State

Variables	n	Mean	Std. Deviation	r-value	p-value	Decision
Assessment Self-Efficacy	200	3.04	0.80			
AI-Based Assessment Use	200	2.96	0.81	**0.59**	**0.000**	Significant

The findings presented in Table 7 show that there exists a moderate positive relationship between teachers' assessment self-efficacy and their usage of AI-based assessment in public secondary schools in Adamawa State ($r = 0.59$, $p = 0.000 < 0.05$). This means that those teachers who have high self-efficacy concerning their assessment practice will be more willing to use AI-based assessment tools in their practice. The fact that p-value is lower than the 0.05 significance level rejects the null hypothesis. It can be concluded that assessment self-efficacy is statistically significantly associated with teachers' use of AI-based assessment.

H_{04}: There is no significant relationship between teachers' self-efficacy and their use of AI-based assessment in public secondary schools in Adamawa State, Nigeria

Table 9a: Model Summary

Model	R	R^2	Adjusted R^2	Std. Error
1	0.74	0.55	0.54	0.42

Table 9b: ANOVA for Multiple Regression

Model	Sum of Squares	df	Mean Square	F-value	p-value	Decision
Regression	45.62	3	15.21	79.12	0.000	Significant
Residual	37.32	196	0.19			
Total	**82.94**	**199**				

Table 9c: Coefficients Table

Variables	B	Std. Error	Beta	t-value	p-value	Decision
Constant	0.62	0.18	—	3.44	0.001	—
Technological Self-Efficacy	0.31	0.05	0.32	6.20	0.000	Significant
Instructional Self-Efficacy	0.29	0.06	0.30	5.83	0.000	Significant
Assessment Self-Efficacy	0.25	0.05	0.27	5.00	0.000	Significant

As shown in Table 9a-9c, the multiple regression analysis demonstrates the existence of a significant relationship between teachers' self-efficacy and the use of AI-based assessment in public secondary schools in Adamawa State. As revealed from the Model Summary (Table 9a), the result indicates that there exists a strong positive relationship between the predictor and the outcome with an R value of 0.74. The R^2 value of 0.55 shows that 55% of variation in the use of AI-based assessment among teachers is determined by the three independent variables (technology, instruction, and assessment self-efficacy), whereas the rest is determined by factors not included in the equation.

According to the ANOVA table (Table 9b), the regression model is statistically significant at $F(3,196) = 79.12$, $p = 0.000 < 0.05$. It means that the model fits well to data and the independent variables predict the dependent one. Thus, the null hypothesis is rejected. The coefficients table (Table 8c) indicates, in addition, that all three predictors made significant individual contribution to the model. Technological self-efficacy was the most influential one ($\beta = 0.32$, $p = 0.000$), followed by instructional self-efficacy ($\beta = 0.30$, $p = 0.000$), and assessment self-efficacy ($\beta = 0.27$, $p = 0.000$). Therefore, it can be argued that all three aspects of self-efficacy have positive effect on teachers' use of AI-based assessment, while technological self-efficacy appears to be the main one.

International Journal of Progressive Sciences and Technologies (IJPSAT)
ISSN: 2509-0119.

https://ijpsat.org/
Vol. 58 No. 2 August 2026, pp. 685-699

5.1 Discussion of the Findings

The results obtained in this study can be compared with empirical data available in the literature, which indicate the significance of teachers' self-efficacy in adopting artificial intelligence in educational context. First, the finding about the relatively high level of technological self-efficacy among teachers agrees with the results of Chiu, Ahmad, and Çoban (2025), according to whom the high levels of AI-related confidence are associated with using digital tools in both instructional and assessment processes. Second, the findings of Du et al. (2024) indicate that AI literacy positively influences technological self-efficacy and encourages using digital technology. In Nigeria, Adigun et al. (2025) similarly found out that teachers' digital skills and self-confidence considerably contribute to teachers' adoption of AI-based learning and assessment systems. Such previous research findings back the current finding that technological self-efficacy is a major factor influencing teachers' adoption of AI-based assessment.

Instructional self-efficacy's significant correlation with teachers' use of AI-based assessment is backed by previous researches as well. Mah and Groß (2024) established that highly efficacious teachers can effectively incorporate AI feedbacks into lesson preparation and teaching decisions. Similarly, Erol (2025) found out that instructional confidence substantially contributes to teachers' willingness to adopt AI integration in pedagogy and assessment processes. Ofem et al. (2025) further indicated that teachers' pedagogical preparedness and instructional beliefs play major roles in their acceptance of AI assessment systems. The above research findings corroborate the current finding that instructional self-efficacy facilitates effective incorporation of AI assessment feedback into teaching process.

The relationship between AI-based assessment use and assessment self-efficacy was significant, yet comparatively weak. This assertion is backed up by the findings of Chou et al. (2024), noting that teachers with high levels of self-confidence in assessments tend to adopt AI-based assessment systems despite having fears regarding their reliability. The same is stated in the research work done by Ofem et al. (2025), where teachers' confidence in assessment processes was revealed to be an important factor influencing their willingness to accept results generated through AI systems. Additionally, Guo, Shi, and Zhai (2024) indicated the importance of usefulness perception and assessment confidence in making the decision to use AI-based assessment technologies. Thus, these scholars confirm that although assessment self-efficacy is critical, it is usually affected by issues of validity and reliability.

Finally, the multiple regression outcome indicating the predictive nature of self-efficacy dimensions towards teachers' use of AI-based assessments is also confirmed by the findings made by Ren et al. (2025), showing the significant influence of digital self-efficacy on AI use by teachers. Furthermore, Mah and Groß (2024) pointed out the collective influence of self-efficacy on teachers' adoption of AI-based instructional and assessment practices. The fact that technological self-efficacy emerged as the strongest predictor is also in line with findings from Du et al. (2024), who found AI literacy and digital competence to be the two most important predictors in technology adoption.

5.1.1 Conclusion

Considering the results obtained in the course of the current study, one can state that the majority of teachers in public secondary schools in Adamawa State have relatively high levels of self-efficacy, both technological, instructional, and assessment. This means that teachers feel themselves confident enough in terms of their professional competencies, namely instructional skills and the ability to use digital devices in educational purposes. Moreover, it has been proved that all three types of self-efficacy significantly impact teachers' use of AI-based assessment. In particular, technological self-efficacy turned out to be the strongest predictor of the use of AI-based assessment by teachers, followed by instructional and assessment self-efficacy. Furthermore, the multiple regression analysis showed that the cumulative impact of the three constructs significantly predicts teachers' engagement with AI-based assessment, accounting for a large part of the variance. This suggests that the self-confidence of teachers in their technological, instructional, and assessment skills determines their usage of the AI-based assessment technologies.

5.1.2 Recommendations

From the above results of the research, the following recommendations were put forward:

1. The government and other educational parties involved should ensure the provision of ongoing professional training to improve teachers' technological self-efficacy in using AI-based assessment tools.
2. School authorities should facilitate capacity-building initiatives intended to increase teachers' instructional self-efficacy, especially in integrating feedback from AI technology in the instructional process.
3. Teachers need to be trained in enhancing their assessment self-efficacy, especially in interpreting and relying on AI-assessment outputs and automated grading.
4. Necessary digital infrastructure and connectivity facilities together with AI-based learning tools should be provided in public secondary schools for successful deployment of AI-assessment practices.
5. It is recommended that the incorporation of AI literacy and educational technology skills should be included in the pre-service teacher education program of curriculum planners and policymakers.
6. The teachers need to engage in continuous learning through collaboration with their peers in order to exchange ideas and develop their competence in using AI-based assessment tools.

Acknowledgement

I sincerely express my gratitude to the management, principals, teachers, and students of the participating schools for their cooperation and support during the data collection process. I also appreciate my research assistants for their dedication and commitment in facilitating the successful conduct of this study. My heartfelt thanks go to my colleagues and everyone who contributed, directly or indirectly, to the completion of this research. Their encouragement, valuable suggestions, and support are deeply appreciated.

REFERENCES

[1]. Adigun, O., Ibrahim, S., & Musa, A. (2025). Teachers' digital competence and technological self-efficacy in the adoption of artificial intelligence in classroom assessment. *Journal of Educational Technology in Africa, 12*(1), 45–62.

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

[3]. Bashraheel, A., & Ghinea, G. (2026). Artificial intelligence in formative assessment: Enhancing feedback and learning analytics in education. *Computers & Education: Artificial Intelligence, 7*, 100–112.

[4]. Caspari-Sadeghi, S. (2022). Learning analytics and AI-driven assessment systems in higher education. *International Journal of Educational Technology, 19*(3), 210–225.

[5]. Chiu, T. K. F., Ahmad, M., & Çoban, Ö. (2025). Teachers' AI competence self-efficacy and adoption of artificial intelligence in education. *Computers & Education, 205*, 104914.

[6]. Chou, C. Y., Chen, Y. L., & Wang, H. T. (2024). Teachers' assessment self-efficacy and acceptance of AI-based evaluation systems. *Educational Assessment Review, 18*(2), 88–103.

[7]. Creswell, J. W., & Creswell, J. D. (2023). *Research design: Qualitative, quantitative, and mixed methods approaches*. Sage.

[8]. Dörnyei, Z., & Dewaele, J. M. (2022). *Questionnaires in second language research*. Routledge.

[9]. Du, X., Li, Y., & Wang, J. (2024). AI literacy and its impact on teachers' technological self-efficacy and digital integration. *Educational Technology Research and Development, 72*(4), 1551–1570.

[10]. Erol, S. (2025). Instructional self-efficacy and teachers' attitudes toward artificial intelligence in education. *Journal of Digital Learning Research, 9*(1), 33–50.

[11]. Field, A. (2022). *Discovering statistics using IBM SPSS statistics*. Sage.

[12]. Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2023). *How to design and evaluate research in education*. McGraw-Hill.

[13]. Guo, L., Shi, Y., & Zhai, X. (2024). Perceived usefulness and teacher acceptance of AI-based assessment tools. *Educational Technology & Society, 27*(1), 56–70.

[14]. Mah, D. N., & Groß, M. (2024). Teacher self-efficacy and AI-supported instructional decision-making. *Teaching and Teacher Education, 132*, 104223.

[15]. Ofem, V., Okonkwo, C., & Adebayo, T. (2025). Teachers' readiness and challenges in adopting AI-based assessment systems in secondary schools. *African Journal of Educational Research, 15*(2), 101–118.

[16]. Pallant, J. (2020). *SPSS survival manual*. Open University Press.

[17]. Rajapakse, R., Fernando, T., & Silva, K. (2024). Trust and self-efficacy in AI-based educational assessment systems. *Computers in Human Behavior Reports, 12*, 100346.

[18]. Ren, Y., Zhang, H., & Liu, X. (2025). Digital self-efficacy and teachers' engagement with artificial intelligence tools in education. *Journal of Educational Computing Research, 63*(2), 245–263.

[19]. Taber, K. S. (2021). The use of Cronbach's alpha when developing and reporting research instruments. *Research in Science Education, 51*(6), 1–24.

[20]. Taherdoost, H. (2021). Validity and reliability of research instruments. *SSRN Electronic Journal*.

[21]. Zulpykhar, A., Sun, L., & Tian, M. (2026). Artificial intelligence-based assessment systems and personalized learning analytics in education. *Smart Learning Environments, 13*(1), 22–39.