Impact of Artificial Intelligence on Assessment, Engagement and Motivation among Secondary School Students in Kaduna State, Nigeria

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ABSTRACT

This paper examined the impact of Artificial Intelligence (AI) on student motivation and engagement in educational assessments. With the growing integration of AI technologies such as adaptive testing, automated grading, and intelligent feedback systems, assessment practices are being reshaped to promote efficiency, fairness, and personalization. The study reviewed the concept of AI in education, highlighting its potential to foster intrinsic motivation, enhance student engagement, and reduce assessment anxiety through real-time feedback and adaptive questioning. However, challenges such as ethical concerns, overreliance on technology, and possible bias in AI algorithms were also discussed. Findings suggest that while AI-powered assessments improve inclusivity, promote continuous learning, and sustain motivation, they also risk diminishing critical thinking and creativity if not carefully managed. The paper concluded that AI-driven assessments must complement, not replace, human judgment, and recommended that educators adopt blended assessment models that balance technology with human-centered learning principles.

Keywords: Artificial Intelligence, Motivation, Engagement, Educational Assessment, Students

INTRODUCTION

Education in the 21st century is undergoing a radical transformation driven largely by the infusion of technology into teaching, learning, and assessment processes. Among these technologies, Artificial Intelligence (AI) has emerged as one of the most influential forces reshaping educational practices. AI refers to computer systems that can perform tasks that typically require human intelligence, such as learning, reasoning, decision-making, and adapting to new inputs (Russell & Norvig, 2020). Its application in education spans across personalized learning systems, intelligent tutoring, automated grading, and adaptive assessments, all of which are redefining how students experience learning and evaluation. One of the most significant areas where AI is making an impact is in educational assessments. Traditionally, assessments have been used primarily to measure student performance, often through standardized tests and summative evaluations.

However, these conventional approaches are increasingly criticized for encouraging rote memorization, fostering test anxiety, and failing to account for individual differences in learning (Selwyn, 2019). Moreover, high-stakes testing has been shown to reduce intrinsic motivation, as students often focus more on grades than on the actual learning process (Ryan & Deci, 2020). AI-driven assessments, by contrast, promise to provide more dynamic, personalized, and student-centered evaluation systems that not only measure learning but also stimulate motivation and engagement. AI-powered assessments employ adaptive algorithms that tailor questions to the student's ability level, ensuring that tasks are neither too easy nor too difficult (Luckin, Holmes, Griffiths, & Forcier, 2016). This adaptive mechanism helps sustain student interest and minimizes frustration, thus enhancing engagement. Additionally, AI provides instant and detailed feedback, allowing learners to recognize their strengths and weaknesses immediately. Research indicates that timely feedback is a crucial determinant of motivation and persistence in learning (Hattie & Timperley, 2007). By offering feedback that is specific, actionable, and personalized, AI promote a sense of competence and self-efficacy, which are essential components of intrinsic motivation (Deci & Ryan, 2000).

Beyond feedback, AI also facilitates continuous and formative assessment, which contrasts with the episodic and high-pressure nature of traditional summative tests. Continuous assessment encourages students to view learning as an ongoing process rather than a one-time evaluation event (Holmes, Bialik, & Fadel, 2021). This shift can reduce performance anxiety and encourage deeper learning engagement. For example, intelligent tutoring systems not only assess knowledge but also adapt instructional strategies to keep learners motivated and on track. These systems transform assessments from being punitive measures into supportive tools that guide learners toward mastery.

Despite these advantages, there are concerns about the increasing reliance on AI in assessment. Critics warn that algorithmic bias, lack of transparency in scoring, and the potential reduction of human interaction may negatively affect student motivation in the long term (Howard & Borenstein, 2018). Furthermore, overdependence on automated systems may undermine creativity and critical thinking if assessments become too mechanistic. Ethical concerns such as data privacy, fairness, and the psychological impact of constant monitoring also pose challenges that educators must address (Kaplan & Haenlein, 2019). The integration of AI into assessments is still at an emerging stage, but the potential benefits are significant. With large class sizes and limited teaching resources, AI-driven assessments could provide efficient and scalable solutions for monitoring student progress and providing personalized feedback. However, to realize these benefits, educators must ensure that AI complements rather than replaces human judgment. Teachers and counsellors remain vital in nurturing student motivation, providing socio-emotional support, and interpreting assessment results within a holistic framework (UNESCO, 2021).

Statement of the Problem

Assessment is a fundamental component of education, designed to evaluate student performance, provide feedback, and guide instructional planning. However, traditional assessment systems are often rigid, stressful, and fail to capture individual learning differences, leading to demotivation and disengagement among students. With the growing adoption of AI-driven assessment tools, there is potential to transform this landscape by providing adaptive, personalized, and engaging learning experiences.

Despite this promise, uncertainties remain about how AI impacts motivation and engagement. Does AI genuinely improve students' intrinsic drive to learn, or does it encourage dependency on automated systems? Can AI-based assessments reduce test anxiety, or do they create new pressures associated with technological reliance? These questions highlight the need for systematic inquiry. In the Nigerian context, limited research has been conducted on the relationship between AI and student engagement in assessments. This study therefore seeks to fill this gap by analyzing the motivational and engagement outcomes of AI-driven assessments.

Objectives of the Study

1. To examine the influence of AI-driven assessments on students' motivation to learn.
2. To analyze the effects of AI-based feedback on students' engagement in learning activities.
3. To identify challenges and ethical considerations in the use of AI for educational assessments.
4. To suggest strategies for integrating AI into assessment practices without undermining student creativity and intrinsic motivation.

Research Questions

1. To what extent do AI-driven assessments influence students' motivation?
2. How does AI-based feedback affect student engagement in educational activities?

Hypotheses

Ho1: AI-driven assessments have no significant effect on students' motivation.

Ho2: There is no significant relationship between AI-based feedback and student engagement.

Ho3: There are no effective strategies for integrating AI in assessments without undermining motivation and creativity.

METHODOLOGY

This study employed a descriptive survey research design. This design was selected because it provides an accurate description of existing conditions, practices, and attitudes among a defined population (Creswell & Creswell, 2018). The survey approach was appropriate since the study sought to measure students' perceptions of the effect of Artificial Intelligence (AI) on their motivation and engagement in assessments. The target population comprised all SSII students of the Demonstration Secondary School, Ahmadu Bello University (ABU), Zaria, during the 2024/2025 academic session which stands at a total of 480 students. The sample size was determined using Yamane's (1967) formula for finite populations at a 5% margin of error, giving a sample of 214 students which was selected using simple random sampling technique. The study used a structured questionnaire titled *Artificial Intelligence and Student Motivation/Engagement Scale (AISMES)*. The instrument consisted of 25 items on a 5-point Likert scale ranging from *Strongly Agree (5)* to *Strongly Disagree (1)*. Three experts in Educational Psychology and Measurement from Ahmadu Bello University, Zaria validated the instrument. A pilot test with 30 students outside the sample produced a Cronbach's Alpha coefficient of 0.84, indicating good internal consistency (George & Mallery, 2019). The researcher personally administered the questionnaire with assistance from class teachers. Out of 214 copies distributed, 200 were retrieved, representing a 93% response rate. Data was analyzed using descriptive statistics (frequency, percentage, mean, and standard deviation) to answer research questions, while Chi-square test and Independent t-test were used to test the hypotheses at the 0.05 level of significance.

RESULTS

Research Question One: To what extent do AI-driven assessments influence students' motivation?

Table 1: Students' Perception of AI-driven Assessments on Motivation

Response	**Frequency**	**Percentage**
Strongly Agree (SA)	82	41%
Agree (A)	74	37%
Neutral (N)	20	10%
Disagree (D)	16	8%
Strongly Disagree (SD)	8	4%
Total	200	100%

Mean = 3.95, SD = 0.84

Majority of students (78%) agreed that AI-driven assessments improved their motivation.

Research Question Two: How does AI-based feedback affect student engagement in educational activities?

Table 2: Effects of AI-based Feedback on Student Engagement

Response	Frequency	Percentage
Strongly Agree (SA)	76	38%
Agree (A)	80	40%
Neutral (N)	18	9%
Disagree (D)	16	8%
Strongly Disagree (SD)	10	5%
Total	200	100%

Mean = 3.98, SD = 0.79

About 78% of students reported increased engagement with AI-driven feedback.

Hypotheses Testing

Hypothesis One: Ho_1: AI-driven assessments have no significant effect on students' motivation.

To test this hypothesis, responses to items measuring motivation were analyzed using the Chi-square (χ^2) test of independence.

Variable	N	df	χ^2-cal	p-value	Decision
AI-driven Assessments × Motivation	200	4	32.84	0.000	Significant (Reject Ho_1)

Table 3 shows that the calculated Chi-square (χ^2) value of 32.84 was greater than the Chi-square critical value of 9.49 at 4 degrees of freedom and 0.05 level of significance. Since the calculated value exceeded the critical value, the null hypothesis which states that AI-driven assessments have no significant effect on students' motivation was rejected, while the alternative hypothesis which states that AI-driven assessments have a significant effect on students' motivation was accepted. This implies that AI-based assessments significantly enhance students' motivation in learning, as they make evaluation more interactive and reduce test anxiety. The finding agrees with Hattie and Timperley (2007) who emphasized that timely and specific feedback increases students' confidence and persistence, and Luckin et al. (2016) who noted that adaptive AI systems sustain motivation by adjusting question difficulty to individual ability levels.

Hypothesis Two (Ho_2): There is no significant relationship between AI-based feedback and student engagement.

This hypothesis was tested using an Independent Samples t-test, comparing the mean engagement scores of students who reported high exposure to AI feedback with those who reported low exposure.

Group	N	Mean	SD	t-cal	df	p-value	Decision
High AI-feedback Group	100	4.12	0.65	4.62	198	0.000	Significant (Reject Ho_2)
Low AI-feedback Group	100	3.72	0.81				

Table 4 shows that the calculated t-value of 4.62 was greater than the t-critical value of 1.96 given 198 degrees of freedom at 0.05 level of significance. Since the calculated value was greater than the critical value, the null

hypothesis which states that there is no significant relationship between AI-based feedback and student engagement was rejected, while the alternative hypothesis which states that there is a significant relationship between AI-based feedback and student engagement was accepted. This implies that AI feedback significantly enhances students' participation and engagement in learning tasks. This finding supports Fredricks, Blumenfeld, & Paris (2004) who identified feedback as a major driver of cognitive and behavioral engagement, and Lee & Hammer (2011) who asserted that gamified AI assessments sustain student enthusiasm and persistence in completing tasks.

Hypothesis Three: There are no effective strategies for integrating AI in assessments without undermining motivation and creativity.

To test this hypothesis, responses related to proposed strategies (e.g., teacher training, balanced integration, ethical safeguards) were analyzed using descriptive mean analysis and a Chi-square test to determine whether respondents agreed on the effectiveness of the strategies.

Variable	**N**	**df**	**χ^2-cal**	**p-value**	**Decision**
AI Integration Strategies × Motivation/ Creativity	200	4	29.45	0.001	Significant (Reject Ho_3)

Table 3 reveals that the calculated Chi-square (χ^2) value of 29.45 was greater than the Chi-square critical value of 9.49 at 4 degrees of freedom and 0.05 level of significance. Since the calculated value exceeded the critical value, the null hypothesis which states that there are no effective strategies for integrating AI in assessments without undermining motivation and creativity was rejected, while the alternative hypothesis which states that there are effective strategies for integrating AI without undermining motivation and creativity was accepted. This implies that effective strategies such as teacher professional training, balanced AI-human assessment models, and ethical safeguards exist to integrate AI responsibly. This is in line with UNESCO (2021) which emphasized the need for human-centered AI integration in education, and Selwyn (2019) who cautioned that overreliance on automation should be mitigated through ethical oversight and teacher involvement.

Summary of Hypotheses Testing

Hypothesis	**Statistical Test Used**	**Result**	**Decision**
Ho_1	Chi-square	$\chi^2 = 32.84$, $p < 0.05$	Rejected
Ho_2	t-test	$t = 4.62$, $p < 0.05$	Rejected
Ho_3	Chi-square	$\chi^2 = 29.45$, $p < 0.05$	Rejected

Research Question One

To what extent do AI-driven assessments influence students' motivation?

This study investigated AI-driven assessments using adaptive learning platforms (specifically Moodle Quiz with Machine Learning capabilities, Quizizz AI, and Kahoot! Smart Practice) that provide real-time feedback and adjust question difficulty based on student performance.

Table 1: Students' Perception of AI-driven Assessments on Motivation

Response	**Frequency**	**Percentage**
Strongly Agree (SA)	82	41%

Agree (A)	74	37%
Neutral (N)	20	10%
Disagree (D)	16	8%
Strongly Disagree (SD)	8	4%
Total	**200**	**100%**

Mean = 3.95, SD = 0.84

The majority of students (78%) agreed that AI-driven assessments improved their motivation. The adaptive nature of AI assessments supports perceived competence by providing appropriately challenging tasks, while immediate feedback enhances autonomy through self-paced learning.

Research Question Two

How does AI-based feedback affect student engagement in educational activities?

AI-based feedback in this study refers to automated, personalized responses generated by intelligent tutoring systems (ITS) and formative assessment tools that analyze student responses and provide tailored suggestions for improvement.

Table 2: Effects of AI-based Feedback on Student Engagement

Response	**Frequency**	**Percentage**
Strongly Agree (SA)	76	38%
Agree (A)	80	40%
Neutral (N)	18	9%
Disagree (D)	16	8%
Strongly Disagree (SD)	10	5%
Total	**200**	**100%**

Mean = 3.98, SD = 0.79

About 78% of students reported increased engagement with AI-driven feedback. AI feedback systems appear to enhance all three dimensions by promoting active participation (behavioral), sustaining interest (emotional), and encouraging deeper processing of content (cognitive).

Hypotheses Testing

Hypothesis One: H_0: AI-driven assessments have no significant effect on students' motivation.

Responses to items measuring motivation were analyzed using the Chi-square (χ^2) test of independence, grounded in Self-Determination Theory to examine how AI assessments influence intrinsic and extrinsic motivation.

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Table 3: Chi-square Test Results for AI-driven Assessments and Motivation

Variable	**N**	**df**	**χ^2-cal**	**p-value**	**Decision**
AI-driven Assessments × Motivation	200	4	32.84	0.000	Significant (Reject H_0)

The calculated Chi-square (χ^2) value of 32.84 exceeded the critical value of 9.49 at 4 degrees of freedom and 0.05 level of significance. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. This finding indicates that AI-based assessments significantly enhance students' motivation in learning by making evaluation more interactive and reducing test anxiety. From the perspective of Cognitive Load Theory, adaptive AI assessments optimize cognitive load by presenting challenges appropriate to learners' current knowledge levels, thereby maintaining optimal motivation.

Hypothesis Two: H_0: There is no significant relationship between AI-based feedback and student engagement.

This hypothesis was tested using an Independent Samples t-test, comparing mean engagement scores of students with high versus low exposure to AI feedback systems (automated tutoring chatbots and instant grading platforms).

Table 4: t-test Results for AI-based Feedback and Student Engagement

Group	**N**	**Mean**	**SD**	**t-cal**	**df**	**p-value**	**Decision**
High AI-feedback Group	100	4.12	0.65	4.62	198	0.000	Significant (Reject H_0)
Low AI-feedback Group	100	3.72	0.81				

The calculated t-value of 4.62 exceeded the critical value of 1.96 at 198 degrees of freedom and 0.05 level of significance. Thus, the null hypothesis was rejected, and the alternative hypothesis was accepted. This finding demonstrates that AI feedback significantly enhances students' participation and engagement in learning tasks. According to the Engagement Framework, engagement comprises behavioral, emotional, and cognitive components that are strengthened by relevant and timely feedback.

Hypothesis Three: H_0: There are no effective strategies for integrating AI in assessments without undermining motivation and creativity.

Responses related to proposed integration strategies (teacher training on AI tools, balanced AI-human assessment models, ethical safeguards, and creative assessment design) were analyzed using descriptive mean analysis and Chi-square test.

Table 5: Chi-square Test Results for AI Integration Strategies

Variable	**N**	**df**	**χ^2-cal**	**p-value**	**Decision**
AI Integration Strategies × Motivation/Creativity	200	4	29.45	0.001	Significant (Reject H_0)

The calculated Chi-square (χ^2) value of 29.45 exceeded the critical value of 9.49 at 4 degrees of freedom and 0.05 level of significance. Therefore, the null hypothesis was rejected, and the alternative hypothesis was accepted. This finding indicates that effective strategies exist for integrating AI into assessments without undermining motivation and creativity.

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DISCUSSION

The analysis revealed a significant effect of AI-driven assessments on students' motivation. Students who participated in AI-assisted assessments using adaptive platforms demonstrated higher levels of interest and enthusiasm than those assessed through traditional methods. From the lens of Self-Determination Theory (Deci & Ryan, 2000), AI assessments enhance intrinsic motivation by satisfying three psychological needs: autonomy (self-paced learning), competence (appropriately challenging tasks), and relatedness (interactive feedback). Furthermore, Cognitive Evaluation Theory suggests that immediate, constructive feedback strengthens learners' perceived competence, thereby increasing intrinsic motivation. This finding agrees with Hattie and Timperley (2007), who reported that immediate and constructive feedback strengthens learners' motivation and confidence. Similarly, Luckin et al. (2016) observed that adaptive AI systems that adjust test item difficulty to match learner ability sustain interest and prevent frustration. The result suggests that AI-driven assessments have the potential to transform the learning environment into a more engaging, supportive, and motivating experience for students.

The analysis demonstrated a significant relationship between AI-based feedback and student engagement. Students who received continuous, personalized feedback through AI platforms (such as intelligent tutoring systems and automated grading tools) were more actively involved in learning activities than those who did not. According to Fredricks, Blumenfeld, and Paris's (2004) multidimensional engagement framework, engagement encompasses behavioral, emotional, and cognitive aspects. AI feedback systems strengthen all three dimensions: behavioral engagement through increased participation in learning tasks, emotional engagement through sustained interest and reduced anxiety, and cognitive engagement through deeper information processing and metacognitive reflection. Lee and Hammer (2011) found that gamified AI systems increase students' persistence, enjoyment, and participation. The interactive nature of AI feedback helps learners monitor their progress in real-time, making learning more dynamic and fostering continuous engagement in academic tasks. This supports Flow Theory (Csikszentmihalyi, 1990), which posits that optimal engagement occurs when challenge levels match skill levels—a balance that adaptive AI systems can maintain effectively.

The analysis revealed that effective strategies exist for integrating AI into educational assessments without negatively affecting students' motivation and creativity. With appropriate ethical frameworks, teacher involvement, and balanced use of AI technologies, assessment systems can become both innovative and human-centered. Drawing on the TPACK framework (Technological Pedagogical Content Knowledge), successful AI integration requires educators to possess not only technological skills but also pedagogical knowledge to implement AI tools in ways that enhance rather than constrain learning. The blended assessment model, which combines AI efficiency with human judgment, preserves the creative and critical thinking elements that purely automated systems might overlook. This finding aligns with UNESCO (2021), which recommended that AI technologies should be integrated into education in ways that uphold ethical standards and support inclusive, learner-centered practices. Similarly, Selwyn (2019) argued that while AI can increase assessment efficiency and fairness, it should complement rather than replace the role of teachers in nurturing creativity and critical thinking. From a constructivist perspective, effective AI integration must support active knowledge construction rather than passive information consumption, ensuring that learning remains both motivational and authentic.

CONCLUSION

Artificial Intelligence is reshaping educational assessments by promoting adaptive, efficient, and personalized evaluation systems. It has the potential to significantly boost motivation and engagement by reducing anxiety, offering real-time feedback, and sustaining learner interest. However, challenges such as bias, overreliance, and reduced human interaction must be addressed. A balanced approach that combines AI with human judgment and ethical safeguards will ensure assessments are both innovative and meaningful.

RECOMMENDATIONS

1. Government and policymakers should integrate AI-driven assessments into national education frameworks while ensuring ethical safeguards.

2. Teachers should combine AI feedback with human guidance to maintain personalized and meaningful evaluation.

3. Schools should organize digital literacy and AI ethics programs to help students engage responsibly with assessment technologies.

4. Further research should explore the long-term motivational outcomes of AI-based assessments in Nigerian schools.

REFERENCES

1. Creswell, J. W., & Creswell, J. D. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). Thousand Oaks, CA: Sage Publications.
2. Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. Psychological Inquiry, 11(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01
3. Deci, E. L., Koestner, R., & Ryan, R. M. (1999). A meta-analytic review of experiments examining the effects of extrinsic rewards on intrinsic motivation. Psychological Bulletin, 125(6), 627–668.
4. Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. Review of Educational Research, 74(1), 59–109. https://doi.org/10.3102/00346543074001059
5. George, D., & Mallery, P. (2019). IBM SPSS statistics 26 step by step: A simple guide and reference. New York, NY: Routledge.
6. Hattie, J., & Timperley, H. (2007). The power of feedback. Review of Educational Research, 77(1), 81–112. https://doi.org/10.3102/003465430298487
7. Hattie, J., & Timperley, H. (2007). The power of feedback. Review of Educational Research, 77(1), 81–112. https://doi.org/10.3102/003465430298487
8. Holmes, W., Bialik, M., & Fadel, C. (2021). Artificial intelligence in education: Promises and implications for teaching and learning. Boston, MA: Center for Curriculum Redesign.
9. Howard, A., & Borenstein, J. (2018). The ugly truth about ourselves and our robot creations: The problem of bias and social inequity. Science and Engineering Ethics, 24(5), 1521–1536. https://doi.org/10.1007/s11948-017-9975-2
10. Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. Business Horizons, 62(1), 15–25. https://doi.org/10.1016/j.bushor.2018.08.004
11. Lee, J. J., & Hammer, J. (2011). Gamification in education: What, how, why bother? Academic Exchange Quarterly, 15(2), 146.
12. Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). Intelligence unleashed: An argument for AI in education. London: Pearson Education.
13. Owens, M., Stevenson, J., Hadwin, J. A., & Norgate, R. (2012). Anxiety and depression in academic performance: An exploration of the mediating factors of worry and working memory. School Psychology International, 33(4), 433–449. https://doi.org/10.1177/0143034311427433
14. Russell, S., & Norvig, P. (2020). Artificial Intelligence: A Modern Approach (4th ed.). Pearson.
15. Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. American Psychologist, 55(1), 68–78. https://doi.org/10.1037/0003-066X.55.1.68
16. Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. Contemporary Educational Psychology, 61, 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

17. Selwyn, N. (2019). Should robots replace teachers? AI and the future of education. Learning, Media and Technology, 44(2), 77–91. https://doi.org/10.1080/17439884.2019.1586012
18. Stiggins, R. J. (2002). Assessment crisis: The absence of assessment for learning. Phi Delta Kappan, 83(10), 758–765.
19. UNESCO. (2021). AI and education: Guidance for policymakers. Paris: UNESCO Publishing.
20. Yamane, T. (1967). Statistics: An introductory analysis (2nd ed.). New York: Harper & Row.