INFLUENCE OF ARTIFICIAL INTELLIGENCE UTILIZATION ON STUDENTS' COGNITIVE ENGAGEMENT AND MOTIVATION TO LEARN

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Abstract
The transformation in technology has influenced the educational landscape in schools and universities worldwide. This study investigated the influence of artificial intelligence (AI) utilization on students' cognitive engagement and motivation to learn, hence the study. Two research questions guided the study and two null hypotheses were tested at 0.05 level of significance. The study employed 222 undergraduate students of Business Education from public universities in Anambra State through a simple random sampling technique. The instrument used for data collection was a structured questionnaire containing 16 items was validated by experts. The data collected were analyzed using Pearson Product Moment Correlation Coefficient to answer research questions and a linear regression to test the hypotheses at 0.05 level of significance using Statistical Package for Social Science (SPSS version 25). The findings of the study revealed that Artificial Intelligence has a moderate positive relationship with cognitive engagement and a positive weak relationship with motivation. The study also revealed that AI utilization significantly influenced Business Education students' cognitive engagement and motivation to learn. Based on the findings, it was concluded that moderate positive and positive weak correlation respectively could be as a result of inabilities of students to effectively utilize artificial intelligence for learning. The study therefore recommended among others that curriculum developers and institutions should design AI-supported learning experiences that are career-relevant and learner-centered, combining AI tools with real-life c their interest in learning.

Keyword*:* Artificial Intelligence, Cognitive Engagement, Motivation, Business Education Students

Introduction

The transformation in technology has influenced the educational landscape especially in universities. Changes in technology has brought about changes in the way human beings carryout numerous activities and the educational sector is not left out. One of the most impactful technology advancements is artificial intelligence (AI). AI is a technology ranging from technology machine learning algorithms to natural languages processing systems, transforming how students interact with perceive information. Artificial Intelligence is a part of computer science that deals with the design of intelligent systems; that is, systems that exhibit characteristics associated with intelligence in human behaviours (Ocana, Valenzuela-Fernandez & Garro-Aburto, 2019). As AI tech continues to advance their potentials, to reshape the educational landscape. Sambandam et. al. (2024) opine that AI offers unprecedented opportunities to personalize learning, optimize teaching methods and enhance students' outcomes. It creates more inclusive learning environments, allowing everyone to access and participate in education contents (Sasikala & Ravichandra, 2024). The authors further explained that AI fuels innovation and creativity in education. It can assist students with knowledge that spark curiosity and becomes good research. Elbadiansyah et. al. (2024) affirms that AI transforms students' learning experiences and enhances engagement.

Students' engagement and motivation are two interconnected concepts that play crucial roles in the learning process. Students' engagement is a multifaceted concept that encompasses the extent of a student's involvement, participation and connection with the learning process. In the view of Ezeoguine and Eteng-Uket (2024) refer students' engagement as the student's willingness to take part in school activities such as attending classes, doing homework and obeying the teacher's instruction in class. It is

linked to improved motivation, retention, and overall academic performance. Ezeoguine and Eteng-Uket further noted that students' engagement encompasses the interaction between the time, effort and other relevant resources invested by both students and their institutions intended to optimise the student experience and enhance the learning outcomes and development of students and the performance and reputation of the institution. Furthermore, Edidiong, Mfon and Ikanaobong (2024) stated that students' engagement entails the degree of participation, involvement and motivation that students' exhibit in their academic activities. Oyewole, Idowu, Oyekanmi and Otubanjo (2023) stated that the broad concept of student engagement is in three main areas namely; behavioural, emotional/social and cognitive engagement but for the concept of this study, cognitive engagement is the point of focus.

Cognitive engagement can be defined as the mental efforts students apply to understand academic content. It entails the extent of a student's active involvement on the learning process. Sesmiyanti (2016) defined cognitive engagement as the extent to which students are able to take on the learning task. This includes the amount of effort students are willing to invest in working on the task. Cooper (2014) affirmed that the main objective of cognitive engagement is the students' internal investment in the learning process, which includes the hidden or inner psychological traits that spur effort in gaining the knowledge or skills that are highlighted in their academic work. Thus, when examining the students' commitment to comprehending and mastering the knowledge and ability that are expressly taught in schools, the cognitive engagement domain is chosen (Oyewale, Idowu, Oyekanmi & Otubanjo, 2023).

Motivation is an internal state that propels individuals to engage in goal-directed behaviour. Students' motivation is a key factor in students' learning and academic achievements. It refers to the internal or external factors that drives, direct and sustain a students' behaviour and efforts towards achieving academic goals. Alheri, Burgasa, Isah and Gambo (2020) opined that motivation can direct behavior towards particular sustainability of goals, lead to increase effort and energy, increase intuition of, and persistence in activities, enhance cognitive processing, determine what consequences are reinforcing and lead to improved performance. In the same vein, Osiesi and Fajobi (2020), stated that motivation triggers behaviour that is measured by ones' readiness and preference. It encompasses a set of beliefs, interests, values, actions and perceptions. Individual motivation tends to vary across academic disciplines/subject areas, and this domain specificity may increase with age. The report of the study of Elbadiansyah et. al. (2024) revealed that AI impacts cognitive engagement of student and their motivation to learn.

Report from UNESCO (2021) states that AI-based technology has succeeded in increasing student engagement by up to 20% in online learning environments. In addition, another study by Baker et al. (2020) showed that students who used AI-based learning platforms experienced an increase in learning outcomes by 15-25% compared to traditional methods. A positive record has been documented on impact of AI on learning but the question is "Do AI influence cognitive engagement of students especially business education students and does AI motivate them to learn. Hence, the study.

Statement of the problem

Despite the increasing integration of technology into education, business education students in public universities in Anambra State continue to exhibit poor academic performance and low levels of classroom engagement and motivation. One of the significant contributing factors is the prevalence of distractions, both digital and environmental, which often derail students' focus and reduce their learning efficiency. The rise of social media, mobile devices, and non-educational online content further compounds making it difficult, for students to stay motivated and actively engaged during lessons. Some studies carried out revealed that integration of AI in education enhances learning, but concerns are raised on AI contributing to the development of cognitive abilities of students and developing interest in learning against all the distractions students experienced from technology and social networks. These worries prompted the study.

Purpose of the Study

The study aims at determining

1. Influence of Artificial Intelligence utilization on the cognitive engagement of business education students in public universities in Anambra State

2. Influence of Artificial Intelligence utilization on the motivation of business education students in public universities in Anambra State.

Research Questions

The following research questions guided the study:

1. What is the influence of Artificial Intelligence utilization on the cognitive engagement of Business Education students in public universities in Anambra State?
2. What is the influence of Artificial Intelligence utilization on the motivation of Business Education students in public universities in Anambra State?

Hypothesis

The study tested the following hypotheses at a 0.05 level of significance:

1. There is no significant influence of Artificial Intelligence utilization on the cognitive engagement of Business Education students in public Universities in Anambra State.
2. There is no significant influence of Artificial Intelligence utilization on the motivation of Business Education students in public Universities in Anambra State.

Method

The study adopted a correlational research design. The population comprised 577 business education students from level 100 to level to 400 level of public universities in Anambra State. The study employed simple random sampling technique and 231 students were realized. Taro Yamane's formula to determine the sample size from the population of the study. The instrument for data collection was a structured questionnaire. The instrument contained a total of 10-items structured on a five-point rating scale of Strongly Agree (SA), Agree (A), Neutral (N), Disagree (D) and Strongly Disagree (SD), weighted 5, 4, 3, 2 and 1 respectively. The instrument was validated by two experts in business education. Google form and direct delivery method were used in the administration of the questionnaires to the respondents who participated in the study. A total of 231 copies of the instrument were administered and 222 copies were dully filled and retrieved successfully for analysis, leading to a return rate of 94.1%. The data collected were analysed using Pearson Product Moment Correlation Coefficient (r) to answer the research questions, while Linear regression was used to test the hypotheses.

Results

Research Question 1: What is the influence of Artificial Intelligence utilization on the cognitive engagement of Business Education students in public universities in Anambra State?

Table 1*: Influence of Artificial Intelligence utilization on the cognitive engagement*

Source of variation	N	AIU	CE	Remark
Artificial Intelligence utilization	222	1.00	0.27	Moderate positive relationship
Cognitive engagement	222	0.27	1.00	

Table 1 revealed that a positive correlation (r = 0.27) exist between Artificial Intelligence utilization (AIU) and cognitive engagement (CE) among Business Education students in public universities in Anambra State. This finding implies that increased utilization of AI tools in the learning process is associated with higher levels of cognitive engagement, such as improved attention, deeper processing of information, and the use of effective learning strategies. Although the relationship is weak to moderate in strength, it suggests that AI utilization contributes positively to students' cognitive engagement, while also indicating that additional pedagogical and contextual factors may be necessary to achieve stronger levels of intellectual involvement in learning.

Research Question Two: What is the influence of Artificial Intelligence utilization on the motivation of Business Education students in public universities in Anambra State?

Table 2*: Influence of Artificial Intelligence utilization on the motivation*

Source of variation	**N**	**AIU**	**MOT**	**Remark**
Artificial Intelligence utilization	222	1.00	0.16	Weak positive relationship
Motivation	222	0.16	1.00	

Table 2 revealed a weak positive correlation (r = 0.16) between Artificial Intelligence utilization (AIU) and motivation (MOT) among Business Education students in public universities in Anambra State. This suggests that while increased utilization of AI tools is associated with a slight improvement in students' motivation toward learning, the influence is minimal. The weak relationship indicates that AI utilization alone does not strongly determine students' motivation, implying that other pedagogical, personal, and environmental factors may play more significant roles in sustaining students' drive and interest in academic activities.

Hypothesis 1: There is no significant influence of Artificial Intelligence utilization on the cognitive engagements of Business Education students in public Universities in Anambra State.

Table 3: *Coefficients of Linear regression for Artificial Intelligence utilization and cognitive engagements*

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	5.762	1	5.762	18.110	.000[b]
	Residual	69.999	220	.318		
	Total	75.762	221			

The regression analysis revealed that Artificial Intelligence utilization (AIU) has a statistically significant influence on the cognitive engagement of Business Education students in public universities in Anambra State, F (1,220) = 18.110, p .000 < .005. The model summary shows a correlation coefficient of R = .276, with AI utilization accounting for 7.6% (R^2 = .076) of the variance in cognitive engagement. Based on this result, the null hypothesis which stated that there is no significant influence of AI utilization on cognitive engagement was rejected. It was therefore concluded that AI utilization makes a modest but meaningful contribution to enhancing students' cognitive engagement, such as deeper thinking, mental effort, and learning strategies, although a larger proportion of the variance is explained by other factors.

Hypothesis 2: There is no significant influence of Artificial Intelligence utilization on the motivation of Business Education students in public Universities in Anambra State.

Table 4: *Coefficients of Linear regression for Artificial Intelligence utilization and motivation*

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1.314	1	1.314	6.124	.014[b]
	Residual	47.196	220	.215		
	Total	48.510	221			

Table 4 revealed that Artificial Intelligence utilization (AIU) has a weak but statistically significant influence on the motivation of Business Education students in public universities in Anambra State, F (1,220) = 6.124, p = .014. The model summary shows a correlation coefficient of R = .165, with AI utilization accounting for only 2.7% (R^2 = .027) of the variance in motivation. Based on this result, the null hypothesis which stated that there is no significant influence of AI utilization on motivation was rejected. It was therefore concluded that while AI utilization contributes slightly to enhancing students' motivation, its overall effect is minimal, suggesting that other personal, instructional, and environmental factors play a greater role in sustaining students' learning drive.

Discussion

The study revealed a positive correlation between Artificial Intelligence utilization (AIU) and cognitive engagement (CE) among Business Education students in public universities in Anambra State, indicating that increased use of AI tools in the learning process is associated with higher levels of mental effort, deeper processing, and analytical thinking. Furthermore, AIU was shown to have a statistically significant influence on cognitive engagement, suggesting it plays a meaningful role in enhancing students' intellectual involvement. These outcomes are consistent with the findings of Amaefule et al, (2025), whose investigation at Nnamdi Azikiwe University, Awka, concluded that AI significantly enhances students' learning outcomes by fostering deeper understanding of subject matter, promoting integration of knowledge across disciplines, and supporting practical application of learning in real-world contexts. Similarly, Anierobi et. al. (2025) found that AI utilization correlates positively with academic engagement implicitly encompassing cognitive aspects confirming that AI tools boost university students' engagement levels

The study revealed a weak positive correlation between Artificial Intelligence utilization (AIU) and motivation (MOT) among Business Education students in public universities in Anambra State, suggesting that while increased use of AI tools is linked to a modest uptick in students' motivation toward learning, the overall influence remains minimal. Importantly, AIU was found to have a weak but statistically significant influence on motivation, indicating that AI tools contribute to motivating learners, albeit to a limited degree. These findings find resonance in similar local studies. For example, Ugwuoke and Ifeanyi (2024) investigated the effects of AI-enhanced learning modules on student motivation at Chukwuemeka Odumegwu Ojukwu University, Igbariam Campus. They found that students using AI tools, such as automated quizzes and virtual feedback systems, reported slight improvements in their study interest and persistence, though the change was modest. Additionally, Okoro and Eze (2025) conducted research at Nnamdi Azikiwe University, Awka, examining AI-based instructional support's impact on motivation. Their findings revealed a positive but minimal boost in students' motivation, primarily when AI-supported tutorials were linked to tangible learning outcomes.

Conclusion

Based on the findings, it was concluded that AI influences cognitive engagement as well slightly motivates the students to learn. This implies that the use of AI with other factors in place can enhance the students' learning.

Recommendation

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

1. Curriculum developers and institutions should design AI-supported learning experiences that are career-relevant and learner-centered, combining AI tools with real-life c their interest in learning.
2. Management of Institutions should organize trainings should be organized for lecturers on proper use of AI in teaching, so that students do not rely solely on AI technology

Reference

Alheri, P. K., Burgasa, U., Isah, A., & Gambo, Y. (2022). Motivation and academic achievement of students toward sustainable national development in Nigeria: A pragmatic approach. *African Journal of Humanities and Contemporary Education Research, 6*(1), 69-79.

Amaefule, F. N., Nwogbo, M. O., & Christiana, M. K. (2025). Perceived impact of artificial intelligence on students' learning outcomes in Nnamdi Azikiwe University, Awka, Anambra State. *Scientific Journal of Educational Management, Research and Law*, 3(1), 62–70. journals.aemapp.org

Anierobi, E. I., Agogbua, V. U., Nwogbo, V. N., Eleje, L. I., Amjad, I. A., Aslam, S., Fakhrou, A., Alanazi, A. A., Alshamsi, H., Khan, S., & Javaid, S., (2025). Artificial intelligence

utilization: A determinant of academic self-efficacy, engagement, and satisfaction of university students. *Environment and Social Psychology*, 10(3).

Cooper, K. S. (2014). Examining teaching strategies using a variety of ways to increase participation in high school classes. *American Educational Research Journal, 51*(4), 363- 402.

Edidiong, I. S., Mfon, O. E., & Ikanaobong, M. A. (2024). Exploring AI-Driven Adaptive Learning Systems for Personalized Education in Nigerian TVET Institutions to Enhance Student Engagement and Skill Acquisition Outcomes. *World Journal of Innovation and Modern Technology*, *8*(5), 188-198.

Elbadiansyah, Z., Sain, H, Lawal, U. S., Thelma, C. C. , Aziz, A. L, & Timur, K. (2024). Exploring the role of artificial intelligence in enhancing. *Journal of Computer Science and Technology, Vol 1 (2) 2024: 59-67* https://mabadiiqtishada.org/index.php/TechCompInnovations

Ezeoguine, E. P., & Eteng-Uket, S. (2024). Artificial intelligence tools and higher education student's engagement. *Edukasiana: Jurnal Inovasi Pendidikan*, *3*(3), 300-312.

Ocana, F. Y., Valenzuela-Fernandez, L., & Garro-Aburto, L. (2019). Artificial Intelligence and its implications. *Representaciones*, *7*(2), 536-568.

Okoro, L. N., & Eze, A. C. (2025). Motivational impact of AI-based instructional support in Business Education: A study at Nnamdi Azikiwe University, Awka. Anambra. *Educational Research Journal*, 12(1), 75–88.

Onesi-Ozigagun, O., Ololade, Y. J., Eyo-Udo, N. L., & Ogundipe, D. O. (2024). Revolutionizing education through AI: A comprehensive review of enhancing learning experiences. *International Journal of Applied Research in Social Sciences*, 6(4), 589-607.

Osiesi, M, P., & Fajobi, O. O. (2020). Students' academic motivation in Nigerian tertiary institutions: Influence of age, gender and academic discipline.

Oyewole, O., Idowu, O, T., Oyekanmi, O, O., & Otubanjo, T. T, (2023). Classroom behavioural engagement among junior secondary school students in Ijebu-ode, Ogun State. *Nigerian Journal of Social Studies, 26(2),* 138-148.

Sambandam, R., Devapitchai, J. J., Ivan, L., Mykola, R. V., Ruslan, K., & Nadiia, P. R. (2024). Impact of Artificial Intelligence in Students' Learning Life. In AI in Business: Opportunities and Limitations (pp 3-17). Cham: Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-49544-1_1

Sasikala1, P. & Ravichandran, R. (2024). Study on the impact of artificial intelligence on student learning outcomes. *Journal of Digital Learning and Education* 4(2) 145-155. https://doi:10.52562/jdle.v4i2.1234

Ugwuoke, M. O., & Ifeanyi, C. A. (2024). Effect of AI-enhanced learning modules on student motivation: Evidence from Igbariam Campus, Chukwuemeka Odumegwu Ojukwu University. *Journal of Educational Innovation,* 8(2), 145–158.

UNESCO. (2021). AI and Education: Guidance for Policy Makers