

Perception and Self-Efficacy of Students Towards Integrating Artificial Intelligence for Academic Purpose in Colleges of Education Niger State

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Abstract

The study investigated the perception and self-efficacy of students towards integrating artificial intelligence for academic purpose in colleges of education Niger State. The study adopted descriptive survey design method. The population of the study comprises all NCE students from both Federal College of Education Kontagora and Niger State College of Education, Minna. The target population was NCE II students. The respondents consisted of 109 randomly selected students from the two institutions. The Instruments for the study are Perception of and Self-efficacy Artificial Intelligence Questionnaire (PSAIQ). The instruments were validated by three experts in Education Technology Department and Education Psychology at FCE Kontagora and COE Minna. Mean and standard deviation was used to answer research questions and Mann-Whitney U-test was used to analyze research hypotheses. Findings revealed that there was a significant difference in the mean of perception of students towards using Artificial Intelligence into academic activities or learning in colleges of education based on institution type; while no significant difference occurs in self-efficacy. It was concluded that student's perception is influenced by the use of artificial intelligence for learning. Majority of respondents favoured the use of artificial intelligence for learning purpose. More importantly, they believe that the use of artificial intelligence for learning purposes will create room for self-development academically, by further searching for knowledge in order to develop themselves on what lecturers taught them in the class. It was therefore recommended among others that, artificial intelligence should be used in learning in Colleges of Education and students should be educated on how it should be used in compliance with academic ethics.

Key Word: Artificial Intelligence Perception, Self-Efficacy, Institution Type

Introduction

Artificial intelligence (AI) is changing the academic learning landscape, promising to enhance personalised instruction, streamline administrative tasks and improve the overall learning experience. AI is now present in almost every aspect of people's daily lives (Muhammad & Emre, 2022). Artificial Intelligence (AI) has been increasingly integrated into education, offering a wide array of tools and systems that can revolutionize the learning process. AI technologies such as intelligent tutoring systems, chatbots, AI-powered dashboards, and automated grading systems have been identified as capable of promoting essential 21st-century skills like collaboration, communication, creativity, critical thinking, and problem-solving in education (Celik, 2024).

These AI-based tools can provide personalized learning experiences, assess individual needs in real-time, and enhance students' understanding of complex physics concepts (Alneyadi & Wardat, 2023). By leveraging machine learning and adaptability, AI can customize curriculum and content to meet students' specific needs, thereby improving the overall quality of learning experiences (Chen *et al.*, 2020).

Artificial Intelligence can play a crucial role in remediating misconceptions among students. Through the development of rule-based, AI tutoring systems, misconceptions can be identified and addressed in real-time, providing personalized feedback and guidance to students (Jayavardhini, 2024). Artificial Intelligence tools can enhance students' achievement, problem-solving skills, improve their understanding of physics concepts, and offer adaptive learning experiences tailored to individual learning styles (Alneyadi & Wardat, 2023). Artificial Intelligence is an unsupervised or partially supervised machine learning framework called "generative AI" uses statistics and probabilities to create artificial intelligence artifacts (Baidoo-Anu & Owusu, 2023). According to Chojnowska (2023), artificial intelligence (AI) focuses on developing intelligent machines that can perform tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, and language translation. Artificial Intelligence systems are designed to learn from experience, adapt to new situations, and improve performance over time without being explicitly programmed. The ultimate goal of Artificial Intelligence is to create machines that can simulate human intelligence, including reasoning, problem-solving, and creativity. Furthermore, artificial intelligence can support meta-skills development among physics students, contributing to the enhancement of educational

practices and outcomes in the field of physics education (Astriawati, 2023). By harnessing the capabilities of artificial intelligence in education, particularly in physics students, educators can create more engaging, effective, and personalized learning environments that cater to the diverse needs of students, ultimately fostering a deeper understanding of physics concepts and facilitating the remediation of misconceptions.

Artificial Intelligence has been used much more in higher institution of learning as a tools for both students and lecturers (Moloi & Marwala, 2021). Based on their individual profiles, learning outcomes, progress, or context, these AI solutions give students insightful feedback on the next steps they should take for a personalized learning experience (Bennett, 2023). Through interactive games, other applications facilitate independent learning for students (Richter *et al.*, 2019). Additionally, computer-assisted evaluation allows for a fully transparent assessment of student achievement (Baykasoğlu *et al.*, 2018). The advanced use of AI by educators is essential and symbolizes the future of this innovation if these tools are to serve education in a sustainable fashion rather than as a threat. As these institutions stand at the forefront of knowledge and innovation, the integration of AI presents both unprecedented opportunities and significant challenges, and this could be achieve with the positive perception of students.

Perception refers to the extent of belief of people that the utilization of artificial intelligence can be used for academic purpose (Habib *et al* 2021). The perception of people, especially colleges of education students towards the utilization of artificial intelligence software will affect students' level of interaction and acceptance of artificial intelligence (Falode and Ajala, 2021). Having positive perception towards using artificial intelligence may likely improve learning of education technology by the students and this will invariably improve their self-efficacy towards using artificial intelligence.

Self-efficacy is the belief that an individual can efficiently perform some tasks that usually influence his or her own behaviour in a positive way. Self-efficacy is a psychological concept that influences behavior (Keiler, 2018). It is a belief in one's capabilities to organize and execute the series of action required to manage prospective situation (Lind *et al.*, 2020). Zahidah (2019) opined that self-efficacy is related to personal perception of a person's capacity to plan and execute actions to achieve specific goals in using artificial intelligence for academic purpose. Therefore, for Colleges of Education to

properly utilise Artificial Intelligence in learning, they must perceived Artificial Intelligence useful in their fields of study and have good self-efficacy in navigating through AI in learning.

Statement of the Problem

Artificial Intelligence can be considered as one of the innovations in education in the 21st century, despite the importance of Artificial Intelligence, it is not fully utilized. Presently, users of it are few, and are untrained professionally in the area of innovative learning in Colleges of Education in Niger State in particular. More preference has been given to the use of outdated methods such as, conventional method of teaching and learning without utilization of Artificial Intelligence.

Conventional method of teaching has been characterized by numerous problems such as pace learning and learning at any distance apart from being in the classroom, thereby denying students the need to receive academic instruction without being physically present in the classroom. If Artificial Intelligence is integrating in learning process in Colleges of Education as modes of instructional delivery, what perception and self-efficacy would Colleges of Education students have towards it? Therefore, it is necessary to look into the current method of instructional delivery which is Artificial Intelligence based, in order to get a suitable strategy that will lead to effective learning by the students. It is on this note that the researcher intends to find out perception and self-efficacy of students towards integrating artificial intelligence for academic purpose in Colleges of Education, Niger State.

Objective of the Study

The main thrust of the research is to examine the perception and self-efficacy of students towards integrating artificial intelligence for academic purpose in Colleges of Education, Niger State.

The specific objectives of the study are to:

- i. Investigate the perception of students towards integrating artificial intelligence into academic activities in colleges of education.
- ii. Assess self-efficacy of students towards integrating artificial intelligence into academic activities in colleges of education.

- iii. Find out perception of students towards integrating artificial intelligence into academic activities in colleges of education based on institution type
- iv. Examine the self-efficacy of students towards integrating artificial intelligence into academic activities in colleges of education based on institution type.

Research Questions

The following research questions were raised to guide the study:

- i. What is the mean of perception of students towards integrating artificial intelligence for academic purpose in colleges of education?
- ii. What is the mean of self-efficacy of students towards integrating artificial intelligence for academic purpose in colleges of education?

Research Hypotheses

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

- i. There is no significant difference in the perception of students towards integrating artificial intelligence into academic purpose in colleges of education based on institution type.
- ii. There is no significant difference in the self-efficacy of students towards integrating artificial intelligence into academic purpose in colleges of education based on institution type.

Methodology

The researcher adopted the descriptive survey design. A survey research is the gathering of information about a large number of people or objects by studying a representative number of the entire group (Ronald & Johnny, 2005). The population of the study comprises all NCE students from both Federal College of Education Kontagora and Niger State College of Education Minna and target population was NCE II students. Multistage sampling technique was employed, firstly purposive sampling

technique was used to selected only two Colleges of Education in available in Niger State for the study. Secondly clustering sample technique was used to clustered various schools within each of the Colleges of Education. Finally, random sampling technique was used to randomly select 109 students from FCE Kontagora and COE Minna for the main study. The Instruments for the study is Perception and Self-efficacy Artificial Intelligence Questionnaire (PSAIQ). The PSAIQ comprises of 10 item for students perception and 10 item for the self-efficacy questionnaire. Perception and Self-efficacy Artificial Intelligence Questionnaire (PSAIQ) was validated by three experts in Education Technology Department and Education Psychology at FCE Kontagora and COE Minna, because research was carried out in Colleges of Education. Mean and standard deviation were used to answer research questions and Mann-Whitney U-test was used to analyze research hypotheses. Mann-Whitney U-test was because it can used to analyse hypothesis when you are comparing two variables in research work.

Results

Research Question One: What is the mean of perception of students towards integrating artificial intelligence for academic purpose in colleges of education?

Table 1: Mean and Sd of perception of students towards integrating artificial intelligence for academic purpose in colleges of education

SN	Item	N	Mean	Sd	Decision
1	I find it easy to apply the artificial intelligence software in in leaning.	109	3.39	0.80	Agree
2	Artificial intelligence software enables me to solve academic problems quickly.	109	3.32	0.70	Agree
3	Using Artificial intelligence software is easy and understandable in instructional delivery.	109	3.39	0.78	Agree
4	Artificial intelligence software is more flexible to teach than traditional method of teaching.	109	3.29	0.69	Agree
5	Artificial intelligence software can open educational opportunities for students to meet up with academics need.	109	3.33	0.77	Agree

6	Using artificial intelligence software will help me to research ahead of other students in my class.	109	3.43	0.77	Agree
7	Teaching and learning process would be difficult without the use of Artificial intelligence software.	109	3.26	0.75	Agree
8	Artificial intelligence software provide opportunity for me to assess numerous materials in my field of study.	109	3.29	0.77	Agree
9	Artificial intelligence software will give me latest information about difference courses.	109	3.55	0.61	Agree
10	Artificial intelligence software has a way of directing mathematics students to learn independently.	109	3.34	0.79	Agree
Grand mean			3.36	0.74	

Decision mean 3.0

Table 1 shows the mean and standard deviation of perception of students towards integrating artificial intelligence for academic purpose in colleges of education. This indicates that all the items scores more than 3.0 decision mean, which imply that college of education students have positive perception towards artificial intelligence. Since all the items on perception of students towards integrating artificial intelligence for academic purpose show agreed based on decision mean of 3.0 with grand mean of 3.36.

Research Question Two: What is the mean of self-efficacy of education technology students towards integrating artificial intelligence for academic purpose in colleges of education?

Table 2: Mean and Sd of self-efficacy of education technology students towards integrating artificial intelligence for academic purpose in colleges of education

SN	Items	N	Mean	Sd	Decision
1	I can use Zotera as artificial intelligence to sources for academic information.	109	3.41	0.80	Agree
2	I can improve my academic skill through the use artificial intelligence.	109	3.14	0.82	Agree
3	I can achieve my instructional goals through the use of artificial intelligence.	109	3.26	0.73	Agree

4	I can solve my academic problems with the use of artificial intelligence.	109	3.14	0.98	Agree
5	I can use Google Scholar for academic as an artificial intelligence.	109	3.21	1.00	Agree
6	I can navigate through ChartGPT as an artificial intelligence tool for academics purpose	109	3.50	0.76	Agree
7	I can use Microsoft Capilot to enable me to develop critical thinking skill.	109	3.36	0.64	Agree
8	I can use Perplexity in solving academics problem in my field of study.	109	3.38	0.71	Agree
9	I can manage time effectively when I use artificial intelligence to receive academic instruction.	109	3.19	0.81	Agree
10	I can accomplish academics task on time with the use of artificial intelligence.	109	3.39	0.78	Agree
Grand mean			3.29	0.80	

Table 2 shows the mean and standard deviation of self-efficacy of education technology students towards integrating artificial intelligence for academic purpose in colleges of education. This indicates that all the items scores more than 3.0 decision mean, which imply that all the items were accepted. The implication is that, self-efficacy of colleges of education students towards integrating artificial intelligence for academic purpose is positive, since all the items show agreed based on decision mean of 3.0 with grand mean of 3.29.

Hypothesis One: There is no significant difference in the perception of students towards integrating artificial intelligence into academic purpose in colleges of education based on institution type.

Table 3: Shows Mann-Whitney U-test of significant difference in the mean of perception of students towards integrating artificial intelligence into academic purpose in colleges of education based on institution type

School Type	Mean		Mann-Whitney Wilcoxon W		z	Sign
	N	Rank	Sum of Ranks	U		
State	84	51.52	4327.50	757.500	4327.500	-2.119 0.03
Federal	25	66.70	1667.50			

Table 3 shows Mann-Whitney U-test that of hypothesis one stated no significant difference in the mean of perception of students towards integrating artificial intelligence into academic purpose in colleges of education based on institution type was tested. The table 3 show p-value = 0.03 since value of $p < 0.05$, H_0 , was rejected. Therefore, there was significant difference in the mean of perception of students towards integrating artificial intelligence into academic purpose in colleges of education based on institution type.

Hypothesis Two: There is no significant difference in the self-efficacy of students towards integrating artificial intelligence into academic purpose in colleges of education based on institution type.

Table 4: Shows Mann-Whitney U-test of significant difference in the mean of self-efficacy of students towards integrating artificial intelligence into academic purpose in colleges of education based on institution type

School Type	Mean		Mann-Whitney Wilcoxon W		Z	Sign
	N	Rank	Sum of Ranks	U		
State	72	57.37	4130.50	1161.500	1864.500	-1.096 .273
Federal	37	50.39	1864.50			

Table 4 shows Mann-Whitney U-test that of hypothesis one stated significant difference in the mean of self-efficacy of students towards integrating artificial intelligence into academic purpose in colleges of education based on institution type was tested. The table 4 show p-value = 0.27 since value of $p > 0.05$,

H01, was accepted. Therefore, there was no significant difference in the mean of self-efficacy of students towards integrating artificial intelligence into academic purpose in colleges of education based on institution type

Discussion of Findings

There was significant difference in the mean of perception of students towards integrating artificial intelligence for academic purpose in colleges of education based on school type (Federal and State). This is in support of the findings of Balaramulu and Uma maheshwari (2015) who carried out study on secondary school student's attitudes towards using internet as learning tool in Warangal District of Telangana State. It was found that there was a difference between private and public school students towards using internet as a learning tool in favour of private school. It is also in support Olorunnegan (2022) who carried out study on assessing secondary school computer science students' attitude, interest and motivation toward internet usage for education in Abuja. It was revealed that there was significant difference between attitudes of senior secondary school computer science students' towards internet usage in public and private secondary schools.

There was no significant difference in the mean of self-efficacy of students towards integrating artificial intelligence for academic purpose in colleges of education based on school type (Federal and State). This is in support of the findings of Kabiru (2017) who found that no significant difference between interest of students in private and public schools interest towards use of internet in secondary schools.

Conclusion

From the findings of this study, it could be deduced that Colleges of education students have positive perception towards integrating artificial intelligence for learning in Niger State. Majority of respondents favoured the use of artificial intelligence for learning purpose. More importantly, they believe that the use of artificial intelligence for learning purposes will create room for self-development academically, by further searching for knowledge in order to develop themselves on what lecturers taught them in the class. Also, most of the respondents have positive self-efficacy towards integrating artificial intelligence for learning, this can be basis for canvassing for integrating artificial intelligence for learning, large of sample used for study possess the skills to navigate through artificial intelligence application .

Recommendations

The following recommendations are proffered based on the findings of this study:

1. The need for adequate provision of internet facilities in Colleges of Education is imperative in order to create room for the integrating of artificial intelligence in learning.
2. Self-efficacy of Colleges of Education students should be developed through proper training in the use of artificial intelligence for learning.
3. The school administrators should create an enabling environment for the integration of artificial intelligence mode of instruction delivery.
4. Colleges of education students should adopt usage of artificial intelligence in carry out research work during their project in final year.

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