

INFLUENCE OF ARTIFICIAL INTELLIGENCE ON THE ACADEMIC PERFORMANCE OF UNDERGRADUATES OF UNIVERSITY OF NIGERIA, NSUKKA

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Abstract

The growing popularity of artificial intelligence tools in the educational sector has continued to divide scholars and stakeholders in the field of education. Therefore, this study investigates the influence of artificial intelligence (AI) on the academic performance of undergraduates in university of Nigeria Nsukka. The major objective of his work is to examine the influence of AI in the academic output of UNN undergraduates. This study adopts the Unified Theory of Acceptance and Use of Technology (UTAUT) as its theoretical framework. The survey research design was employed, using a structured questionnaire to elicit the

opinion of respondents. The online Australian Calculator was used to select 384 respondents out of the total population of 35,130 undergraduates in 2024 according to the Academic Planning Unit. The multi-stages sampling technique was used to get to the individual participant. The data generated from the field was analyzed quantitatively and presented in percentages and tables. Findings revealed that UNN undergraduate are very much aware of AI tools and also use AI tools for academic purposes. Based on the findings of this work, the study recommends that sensitization workshops should be carried out for lecturers and students to bring them up to speed with the latest AI tools and trends. Also, students should ensure moderation and responsibility in the use of AI tools in education as despite the numerous benefits of the use of AI tools in education, it can be a damaging tool, if used wrongly.

Keywords: Influence, Artificial Intelligence, Academic performance.

Introduction

The past few years have brought about an explosive growth in Artificial Intelligence (AI) with different AI tools being rolled out across different sectors which has led to claims in some quarters that AI is the new oil (Palmer, 2006). Artificial intelligence (AI) refers to the creation of computer systems capable of performing tasks that historically only a humanbeings could do, such as reasoning, making decisions, or solving problems. It is also the mechanical stimulation of human intelligence processes especially computer systems. (Nwaguma&Onyekwu, 2023). AI is the science and engineering of making intelligent machines, especially intelligent computer programs (McCarthy, 2007). According to Copeland (2022), Artificial Intelligence is the ability of a digital computer or computer-controlled robot to perform tasks commonly associated with intelligent beings.

Luckin, Holmes, Griffiths & Forcier (2016) note that at the heart of AI in education is the scientific goal to “make computationally precise and explicit forms of educational, psychological and social knowledge which are often left implicit.”¹³ In other words, in addition to being the engine behind much ‘smart’ ed tech, AI in education is also a powerful tool to open up what is sometimes called the ‘black box of learning,’ giving us deeper, and more fine-grained understandings of how learning actually happens (for example, how it is influenced by the learner’s socio-economic and physical context, or by technology).

The growing popularity of Artificial Intelligence tools in the educational sector has continued to divide scholars and stakeholders in the field of education. While some argue that the arrival of Artificial Intelligence into the educational sector is a welcome development meant to increase effectiveness of teaching and learning, others argue that the arrival of Artificial Intelligence poses a great challenge to the educational sector and might further weaken the quality of education.

However, in the midst of all these divisive opinions, Artificial Intelligence (AI) seems to have come to stay in our educational system going by the new educational innovations being rolled out by major players in the industry almost on a regular basis. It is instructive to note, that there has been no clear-cut answer as to what kind of impact Artificial Intelligence have on the academic performance of students; be it negative or positive.

The benefits of accepting Artificial Intelligence (AI) in our educational system are enormous as it can lead to improved performances for students if used properly by providing students access to countless materials for buttressing what is learnt in class, the adoption of AI in education is also capable of revolutionizing the academic experience of students and teachers alike.

On the other hand, a refusal to accept the introduction of AI into the Nigerian educational system might lead to stagnation due to the resultant inability of Nigerian students and educators to measure up with the current global best practices in education. It is therefore against this backdrop that this study seeks to examine the influence of Artificial Intelligence (AI) on the academic performance of University of Nigeria, Nsukka students. The geographical scope of this study is the entire undergraduate students of the University of Nigeria Nsukka for the 2023/2024 session while the content scope is limited to Artificial Intelligence (AI) tools used in the formal educational sector. This geographical scope is as a result of the proximity of the researcher to the institution which makes it more efficient to monitor responses within the institution, the limitation of the content scope to the use of Artificial intelligence in the formal educational sector is due to the focus of research being on monitoring the impact of Artificial Intelligence tools on tertiary education students.

Objectives of Study

The general objective of this study is to examine the Influence of Artificial intelligence (AI) on the academic performance of UNN undergraduates. While the specific objectives of this study are to:

1. Determine the level of awareness on Artificial Intelligence (AI) tools amongst UNN students.
 1. Ascertain the level of exposure of UNN students to Artificial Intelligence tools
 2. Ascertain the level of adoption of Artificial Intelligence tools into academics amongst UNN students
 3. Examine the perception of UNN students on Artificial Intelligence tools in their academics.

4. Assess the influence of Artificial Intelligence (AI) tools on the academic performance of UNN students.

Literature Review

In the field of education, the use of Artificial Intelligence is very much rampant as Artificial intelligence has been growing in the education sector because of its strategic value. AI can be used as a potent learning tool which reduces the burdens of teachers and learners, thus assisting students in getting learning experiences effectively (Colchester, Hagra, Alghazzawi, & Aldabbagh; 2017). At the heart of Artificial Intelligence in Education (AIED) is the scientific goal to “make computationally precise and explicit forms of educational, psychological and social knowledge which are often left implicit.” In other words, in addition to being the engine behind much ‘smart’ ed tech, AIED is also a powerful tool to open up what is sometimes called the ‘black box of learning,’ giving us deeper, and more fine-grained understandings of how learning actually happens; for example, how it is influenced by the learner’s socio-economic and physical context, or by technology (Self, 1999). The advent of Artificial Intelligence (AI) in Education has made the process of academic support easier to come by for students and teachers. Academic support is seen as the interaction between students and higher education representatives to promote student retention and success. Academic institutions worldwide prioritize improving academic support due to its role in achieving the student success, satisfaction, and graduation rates. Advisors also play a key role by guiding students on academic, personal, and social issues (Gordon et al., 2011; Johnson et al., 2022). Technology is revolutionizing academic support by shifting from traditional, human-centered approaches to automated AI based online methods (Al-Nory, 2012; Caratiquit & Caratiquit, 2023). Electronic resources, readily available in most universities, offer a non-traditional support experience.

This technological transformation aims to reduce costs, increase flexibility, accountability, and streamline services, ultimately enhancing graduation rates and student satisfaction (Dahri et al., 2023a, b; Dahri, Vighio, Alismaiel, et al., 2022). However, technology should be viewed as a supportive tool rather than a replacement for human advice/ teaching as the integration of human and technological elements can save time for advisors, improve the student experience, satisfaction, and contribute to timely graduation (Assiri et al., 2020). Artificial intelligence tools have gained prominence in higher education institutions (HEIs) and have been used in various nations across the globe (Ahmad et al., 2021). These AI tools have helped in a transformative era of academic support within HEIs, going beyond conventional boundaries. The multifaceted advantages of AI tools in education include personalized guidance, timely assistance, data-driven insights, and 24/7 availability through AI chatbots and virtual advisors. This constant accessibility is particularly valuable in the digital age, where students seek instant solutions to academic queries and enhanced engagement. These tools foster active support, allowing students to seamlessly interact with academic guides, strengthening their connection and engagement with the educational institution (Bilquise et al., 2023; Dahri et al., 2019; Huang, 2015).

Moreover, the application of AI in higher education extends beyond basic automation. Notably, intelligent tutoring systems serve as personalized mentors, providing real-time guidance and adaptive practice in various subjects. These AI-powered platforms enable continuous assessment and offer immediate feedback, empowering students to monitor their progress and refine their study strategies. This real-time feedback loop cultivates critical thinking, problem-solving, and metacognition (Bilquise et al., 2022). Some Artificial Intelligence (AI) tools that can be used in the field of education include: Grammarly, Quilbot, Google Classroom, Augmented Reality (AR) and Virtual Reality

(VR), ChatGPT, Gemini (formerly Google Bard), Intelligent tutoring systems (ITS), Turnitin, Otter Ai, Quizlet, Project Essay Grade (PEG) Writing Scholar, Padlet, Presentation Translator, Smartboard, Robot, Scopus, ResearchGate etc.

Lawan et al (2023) in their study “Modified Flipped Learning as an Approach to Mitigate the Adverse Effects of Generative Artificial Intelligence on Education” explored the potential of modified flipped learning as an approach to mitigate the effects of GAI on education. The study also addressed concerns related to the responsible use of GAI, ethical considerations, and the role of educators in guiding students’ interactions with intelligent systems. In conclusion, the study found that the proposed modified flipped learning model would empower students to actively engage in the learning process and take ownership of their education by replacing the traditional role of the teacher with the use of GAI systems for pre-class activities and content creation. However, the authors recommended further research to explore the effectiveness of flipped learning in this context and identify the best ways to implement the approach in the classroom

Theoretical Framework

Having reviewed the theories above, this study adopts the **Unified Theory of Acceptance and Use of Technology (UTAUT)** as its theoretical framework. The Unified Theory of Acceptance and Use of Technology (UTAUT) is a theory which examines the acceptance of technology, determined by the effects of performance expectancy, effort expectancy, social influence and facilitating conditions. This theory formulated by Venkatesh et al (2003) suggests that the actual use of technology is determined by behavioural intention. The perceived likelihood of adopting the technology is dependent on the direct effect of four key constructs, namely performance expectancy, effort expectancy, social influence, and facilitating conditions. The effect of predictors is

moderated by age, gender, experience and voluntariness of use (Venkatesh et al., 2003). Here, performance expectancy is defined as "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" while effort expectancy is defined as "the degree of ease associated with the use of the system" the social influence factor on the other hand refers to an individual's feeling that they are expected to use a new technology or when it is made mandatory to use new technologies; the last construct of the UTAUT is the availability of facilitating conditions is defined as "the degree to which an individual believes that an organization's and technical infrastructure exists to support the use of the system". UTAUT relies heavily on the moderation effects of age, gender, experience and voluntariness of use. Age moderates the effect of all four predictors. Gender effects the relationships between effort expectancy, performance expectancy and social influence. Experience moderates the strength of the relationships between effort expectancy, social influence and facilitating conditions. Voluntariness of use has a moderating effect only on the relationship between social influence and behavioural intention (Venkatesh et al., 2003).

In relation to this study, the ideas of UTAUT come in handy with regards to the use of Artificial Intelligence (AI) in the educational sector due to the growing acceptance of AI in the educational sector especially tertiary education in areas such as research, teaching, learning etc. The effect of Artificial Intelligence tools on academic performance as well as the seeming ease of use of AI tools in education makes the UTAUT the most suitable model for this study coupled with the insights into the existing environment for the use of AI tools in education covered in this study. In this work, the status of AI use among University of Nigeria, Nsukka (UNN) undergraduates would be investigated using the UTAUT theory.

Methodology

This study adopted survey as the research method in achieving the research objectives due to the nature of the research topic. The population of this study is the undergraduate students of University of Nigeria, Nsukka Campus. The population, according to the academic planning unit UNN, was 35,129 for undergraduate of 2023/2024 session. For this study, the sample size of 381 was used. This was derived using the Australian sample size calculator provided by the National Statistical Services (NSS) of Australia. The study adopted a multi-stage sampling technique in arriving at the sample to study. A structured 5-point Likert scale questionnaire was used as instrument for data collection from respondents in this study. It has two sections which are: Demographic and Psychographic section. Only closed-ended questions of which the respondents were given predetermined group of options. Closed ended questions was adopted to lessen the obstacles and improve overall data collection. The quantitative analysis was used statistical methods and numerical tables to help the researcher to answer the research questions. It also includes computing the mean and standard deviation from the collected data using SPSS application. While the qualitative analysis will make it easier to provide descriptive answers, which improved how the study questions were interpreted. Simple tables were used by the researcher to show the results. To guarantee accuracy and clarity, the data was analyzed and interpreted in a certain order. To be assured of a clear and transparent presentation of data gathered during the research; charts, tables, simple percentages will be duly and appropriately adopted.

Findings

A total of 381 copies of questionnaire were administered. The responses from the respondents were collected by the researcher which were used for analysis. All 381 questionnaires were returned representing 100%, 370

questionnaires were properly filled representing 97% and 11 questionnaires representing 3% was not properly filled. The questionnaire contained questions with a combination of closed ended questions only. The table below shows how they were represented.

Table 1: Level of awareness of Artificial intelligence tools in education among UNN undergraduates.

Variables	Frequency	Percent (%)
Strongly Agree	156	42
Agree	99	27
Undecided	70	19
Disagree	45	12
StronglyDisagree	-	-
Total	370	100

The table above shows that 156 (42%) of the respondents strongly agree that they are aware of Artificial intelligence tools in education, 99 (27%) of the respondents agree that they are aware of Artificial intelligence tools in education, 70 (19%) of the respondents aren't sure if they are aware of Artificial intelligence tools in education, 45 (12%) of the respondents disagree that they are aware of Artificial intelligence tools in education, while none of the respondents strongly disagree.

Table 2: Respondents’ response to level of exposure to Artificial Intelligence tools.

Variables	Frequency	Percent (%)
StronglyAgree	44	12
Agree	199	54
Undecided	105	28
Disagree	15	4
StronglyDisagr ee	7	2
Total	370	100

The table above shows that 44 (12%) of the respondents strongly agree that they are well exposed to Artificial Intelligence tools, 199 (54%) of the respondents agree that they are well exposed to Artificial Intelligence tools, 105 (28%) of the respondents are undecided that they are well exposed to Artificial Intelligence tools, 15 (4%) of the respondents disagree that they are well exposed to Artificial Intelligence tools, while 7 (2%) of the respondents strongly disagree that they are well exposed to Artificial Intelligence tools.

Table 3: How UNN undergraduates perceive Artificial Intelligence tools as an educational aid.

Variable	Frequency	Percentage (%)
StronglyAgree	187	51
Agree	103	28
Undecided	17	5
Disagree	19	5
StronglyDisagree	44	12
Total	370	100

The table above shows that 187 (51%) of the respondents strongly agree that they feel that there is still not enough understanding of what Artificial Intelligence tools are

among students, 103 (28%) of the respondents strongly agree that they feel that there is still not enough understanding of what Artificial Intelligence tools are among students, 17 (5%) of the respondents are undecided that they feel that there is still not enough understanding of what Artificial Intelligence tools are among students, 19 (5%) of the respondents disagree that they feel that there is still not enough understanding of what Artificial Intelligence tools are among students, while 44 (12%) of the respondents strongly disagree that they feel that there is still not enough understanding of what Artificial Intelligence tools are among students.

Table 4: Respondents’ level of adoption of Artificial Intelligence tools for academic research

Variable	Frequency	Percent (%)
StronglyAgree	107	29
Agree	183	50
Undecided	52	14
Disagree	20	5
StronglyDisagree	8	2
Total	370	100

The table above shows that 107 (46%) of the respondents strongly agree that they make use of Artificial Intelligence tools for academic research, 183 (50%) of the respondents agree that they make use of Artificial Intelligence tools for academic research, 52 (14%) of the respondents are undecided that they make use of Artificial Intelligence tools for academic research, 20 (5%) of the respondents disagree that they make use of Artificial Intelligence tools for academic research, while 8 (2%) of the respondents strongly agree that they make use of Artificial Intelligence tools for academic research.

Table 5: Respondents’ response on the implication of adopting Artificial Intelligence tools into academics.

Variable	Frequency	Percent (%)
StronglyAgree	38	10
Agree	143	39
Undecided	95	26
Disagree	30	8
StronglyDisagree	64	17
Total	370	100

The table above shows that 38 (10%) of the respondents strongly agree that their use of Artificial Intelligence tools make them better academically, 143 (39%) of the respondents agree that their use of Artificial Intelligence tools make them better academically, 95 (26%) of the respondents are undecided that their use of Artificial Intelligence tools make them better academically, 30 (8%) of the respondents disagree that their use of Artificial Intelligence tools make them better academically, while 64 (17%) of the respondents strongly disagree that their use of Artificial Intelligence tools make them better academically.

Discussion of Findings

Findings on the demographic data of the respondents showed that most of the respondents were between the ages of 19 and 24, while the number of those between the 25 years and above was also significantly large. Also, most of the respondents were female.

Findings shows that the respondents (UNN students) are very much aware of Artificial Intelligence tools around them. From the findings, the respondents are aware of numerous Artificial Intelligence tools they can use to supplement learning. This is in line with Dahiri et al (2024), "Investigating AI-based academic support acceptance and its impact on students". The findings of the study indicated that performance and effort expectancy, information accuracy of

AI tools, pedagogical fit to meet the student's expectations, and student interaction with tools were important factors in predicting the acceptance and use of AI tools among students of both countries in higher education, and the rising use of these AI tools has improved students' satisfaction levels and significantly impacted students learning outcomes in both countries. The study also proves that students in tertiary institutions are accepting Artificial intelligence and use it for academic improvement. Findings two indicate that UNN students are exposed to Artificial Intelligence tools. The findings revealed that UNN students use Artificial Intelligence tools for their personal study (table 14), though UNN students are not exposed to Artificial Intelligence tools used in the class, the study also reveals that UNN students are not forced by their lecturers to get exposed to Artificial Intelligence tools (table 15). This finding is a testament of the growing popularity of AI tools in education and agrees with the findings of Luckin, Holmes, Griffiths &Forcier (2016) who posit that there is a need to promote the development of adaptive learning environments and other AIED tools that are flexible, inclusive, personalized, engaging, and effective.

Another findings indicates that majority of UNN students have a positive perception towards the use of Artificial Intelligence tools. Table 16 shows that most of the respondents (90%) strongly agree that Artificial Intelligence (AI) tools makes their academic life easy. The findings also reveals that most of the respondents feel that Artificial Intelligence (AI) tools are underutilized in Tertiary institutions. The findings on the research indicate that most UNN students according to the data gotten from the respondents, frequently make use of Artificial Intelligence (AI) tools for their academic research. A significant percentage of the respondents agree that they make use of Artificial Intelligence (AI) for their assignments (table 22). A significant percentage of the respondents also agree that they use Artificial Intelligence (AI) tools for their personal study

(table 23). The findings revealed that a large percentage of UNN students frequently make use of Artificial Intelligence tools for most of their school activities and it makes their academic life easy. AI tools like Chat GPT, Copilot and Bing AI are a testament to the growing use of AI tools in academic research. Findings on the research indicates that most of the respondents (UNN students) said that Artificial Intelligence (AI) tools help them improve their academic performance. From the findings, a significant percentage of the respondents agreed that AI tools make them better academically. These findings agree with Colchester et al. (2017) who posit that AI can be used as a potential learning tool which reduces the burdens of teachers and learners, thus assisting students in getting learning experiences effectively. The study revealed that according to the respondents, Artificial Intelligence (AI) tools are used to prepare better for examinations. This is in line with the findings of Dahiru et al (2024) and Bozic (2023) who posit that enhanced learning experience, personalized learning, and effective conduct of examination are some importance of Artificial Intelligence in education.

Recommendations

Based on the findings of the study, the following is recommends:

1. Considering the growing importance of AI amongst UNN students, its gains should be consolidated through the adoption of AI tools at every stage of the learning and teaching process.
2. Sensitization workshops should be carried out for lecturers and students to bring them up to speed with the latest artificial intelligence tools and trends in the use of Artificial Intelligence in education.
3. Students should ensure moderation and responsibility in their use of AI tools in education as despite the numerous benefits of the use of AI tools in education, it can be a damaging tool if used wrongly.

4. Lecturers should be trained on how best to support students in their utilization of AI tools in education
5. More controlled studies should be carried out to determine the influence of AI tools on academic performances using multiple tertiary institutions.

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