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CHALLENGES OF THE USE OF ARTIFICIAL INTELLIGENCE ON ACADEMIC PERFORMANCE OF UNDERGRADUATE STUDENTS IN PUBLIC UNIVERSITIES IN ANAMBRA STATE

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ABSTRACT

The study investigated challenges of the use of Artificial Intelligence for academic performance among undergraduate students in public universities in Anambra State. Three research questions guided the study. Descriptive survey research design was adopted for the study. The population of the study consisted of all 400 level undergraduates of 2023/2024 in public universities in Anambra state. The total is 23,621 comprising 12639 males and 10982 females. The sample of the study was 600 undergraduates. The sample comprised of 600 undergraduate students. The sample was composed using the simple random sampling technique. Data collected were analyzed using mean. The findings of the study showed that undergraduate students in public universities in Anambra State abuse Artificial Intelligence. It was also deduced that the abuse of Artificial Intelligence negatively affects academic performance of undergraduates' in public universities in Anambra State. This is because undergraduate students in public universities in Anambra State are abusing Artificial Intelligence. The worse of it all is that they use it for examination malpractices, and students who abuse AI no longer study as required. They use it to write assignment. Excessive use of AI tools by students facilitates academic dishonesty, such as generating essays or solving problems without effort. AI tools may not fully understand the context of assignments, leading to inaccurate or irrelevant results for students. All these make them to perform below expectations in their academic activities. This led to the conclusion that the misuse of Artificial Intelligence tools by undergraduate students in public universities in Anambra state negatively affects their academic performance. It was recommended among other things that government and school management in public universities should implement AI tools in a way that complements traditional learning methods, to promote a balanced approach to education.

Keywords: Challenges; Artificial Intelligence; Academic Performance; Undergraduate.

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Introduction

Education is an important facet in life; it is a fundamental component of human development and societal progress, serving as a catalyst for individual growth, social mobility, and economic advancement. With globalization and the world's increasing focus on knowledge based economy, education has become more important than ever. It has also led to the global recognition of the rights of individuals. Education stimulates and empowers people to participate in development. This is because the world's faith lies in the power of education to transform individuals through the school system.

Education takes various forms, ranging from formal schooling to informal learning experiences embedded within family, community, and workplaces. Formal education typically occurs within structured institutions such as secondary schools, colleges, and universities, following standardized curricula and assessment frameworks. Universities are established with the intention of promoting technology and technical education or producing technical manpower for the technological advancement and promotion of innovation in a country (Doern, 2018). Technological innovation, automation and effective adoption of telecommunication have greatly contributed to school operations all over the world. Adopting ICT innovations in universities is the major driving force for the effective activities that goes on during lessons. It also promotes the quality of service delivery and users' satisfaction. Given the relevance of ICT in activities that goes on during academic activities, it is necessary for university students to be abreast of global trends and the adoption of Artificial Intelligence in their academic pursuit. The term Artificial Intelligence means a machine-based system that can make predictions, recommendations or decisions influencing real or virtual environments. It is the process of building intelligent machines from vast volumes of data. Students learn from past learning experiences and perform human-like tasks, hence, artificial intelligence enhances the speed, precision, and effectiveness of human efforts. Adejo and Yakubu (2023) defined AI as a system that changes behaviour based on data collected, usage analysis, and other observations without being explicitly programmed. This implies that AI is a constellation of technologies that enable machines to act with higher levels of intelligence while emulating human capabilities to sense, comprehend and act. AI uses complex algorithms and methods to build machines that can make decisions on their own.

Some examples of Artificial Intelligence (AI) used by students are: Virtual

learning platforms which include: Online course platforms like Udemy, Coursera, and edX, Intelligent tutoring systems, such as AI-powered tools like Khan Academy, DreamBox, and Carnegie Learning, Language Learning apps such as: Duolingo, Babbel, and Rosetta Stone, Essay Writing Tools such as AI-powered tools like Grammarly, Pro Writing Aid, and Turn it in, Mathematics and Science Problem Solvers which include: Wolfram Alpha, Symbolab, and Mathway, Research Assistants such as Google Scholar, Semantic Scholar, and Microsoft, Virtual Study Groups; they include: Discord, Slack, and Google Groups. Others are: AI-powered note-taking, such as: tools like Evernote, OneNote, and Simplenote, Learning Management Systems which include: Canvas, Blackboard, and Moodle. These AI tools enhance student learning, productivity, and accessibility, and are becoming increasingly popular in education.

Historically, Artificial Intelligence can be traced to ancient times. According to Bitcoin Forum (2023), the term "AI" was coined by John McCarthy of MIT. the concept of artificial intelligence dates back to ancient philosophers and automatons, or mechanical devices that move independently of human intervention. Between 1940-1960, the field of artificial intelligence was born out of cybernetics and the desire to understand how machines and organic beings function together. Around 1950s, the development of computers and binary logic laid the groundwork for AI. Around 1960, AI entered a "winter" due to limited computing power and memory. Around 1980, the advent of microprocessors led to the development of expert systems, which were based on an inference engine that mimicked human reasoning (Huang, 2023). Around 1990, Mamela (2023), pointed out that AI experienced a resurgence with the success of IBM's Deep Blue chess-playing computer and the development of machine learning algorithms. In 2010: The availability of massive data and advances in computing power led to a new boom in AI, with significant public successes and increased funding. Presently, AI is being used in various applications, including voice and image recognition, natural language processing and robotics.

AI is a technological innovation which is of interest to various professionals, the general public, as well as educators; and AI resources have been adopted by various professionals and individuals in carrying out their daily tasks (Muayyad and Maha, 2024). Artificial Intelligence is emerging as one of the most powerful agents of change in higher education, presenting the sector with unprecedented academic, ethical and legal challenges. Through its algorithmic ability to adapt,

self-correct and learn. AI is pushing the boundaries of human intelligence, making the future of higher education inextricably intertwined with AI (Okeke, 2024). When the students spend time in school, they focus on their creativity, exploring new things, building their communication skills, and solving problems. Students use AI tools for administrative support, such as streamlining tasks and answering questions about financial aid and career opportunities. AI tools are used to personalize teaching and learning, including generating content, writing code and detecting plagiarism. AI tools are used to help students with writing and research, such as proofreading, suggesting alternative phrasings and summarizing texts.

Students in developed countries use artificial intelligence to help students with learning difficulties, mentors learners, for language learning applications and text-to-speech generators, support administrative processes in educational settings. They use AI tools for research support, including sorting through data, identifying patterns and recommending relevant articles. Artificial intelligence is therefore used for academic purposes such as adaptive learning, assistive technology, early childhood education, Data and Learning Analytics, Scheduling, Facilities Management, Overall School Management and writing (Okeke, and Ezeah, 2024). In explaining the above variables, AI is Used to teach students basic and advanced skills by assessing their present skill level and creating a guided instructional experience that helps them become proficient. By assistive technology, it implies that AI can help special needs students access a more equitable education, for example by "reading passages to a visually impaired student. AI is currently being used to power interactive games that teach children basic academic skills and more. Positively AI can tailor instruction to individual students' needs, abilities, and learning styles, AI can provide one-on-one support and feedback, simulating human tutors, can free up instructors' time, reducing workload and improving feedback accuracy, AI-powered interactive tools and simulations can increase student engagement and motivation, can help students with disabilities, such as text-to-speech systems and speech recognition, can help teachers identify areas where students need extra support, enabling targeted interventions, can create immersive, interactive learning experiences, and expanding access to education. This shows that artificial intelligence seems to affect academic performance of undergraduates in developed countries positively.

Academic performance refers to the level of success or accomplishment a student demonstrates in their academic pursuits, typically measured by their grades, test scores, and overall academic performance. Academic performance according to Onah (2017) is the outcome of students' evaluation in the educational process indicating to what level the students have achieved the educational goals as specified in the curriculum which is greatly influenced by internal and external classroom factors. Artificial intelligence (AI) can affect academic performance of undergraduate students negatively if over used or abused. Nigerian university students seem to lack the zeal to read and do a proper research because of AI. Presently AI is now the Messiah to many Nigerian students. Nigerian student before now were known to be very intelligent not minding their semi failed educational system but now, the reverse is the case because students no longer study as they continue to use AI. Furthermore, if students become overly dependent on artificial intelligence, it would limit their abilities critical thinking skills and cognitive abilities. Students will become very dependent on machines. This will hinder them from learning what it means to multitask or push themselves to be creative. This therefore limits their ability to attain their full potential and explore their abilities as their assignments will now be made easier through the use of artificial intelligence.

Some Nigerian students have been known to abuse the use of artificial intelligence (AI), they use it for examination malpractice. Students may use AI-powered chatbots to provide answers during online examinations. They use AI-powered tools to generate essays, making it difficult to detect plagiarism. AI-powered calculators are used to solve complex mathematics problems, potentially used to cheat on examinations. AI algorithms are used to analyze past examinations and predict future questions, giving some students an unfair advantage. AI-powered deep fakes are used to impersonate students during online examinations. In that regard, Omame and Alex, (2020), supported that students using Artificial Intelligence (AI) to write exams are growing concern in academic integrity. This can include: using AI tools to generate answers to exam questions potentially without understanding the content, utilizing AI-powered tools to write entire essays or assignments, potentially passing them off as their own work. Relying on AI-powered chatbots or tutoring tools to complete assignments or answer exam questions without proper understanding.

Based on the foregoing, it appears Nigerian students use AI tools negative and if abused can cause overreliance on

technology. This is because excessive AI use can lead to decreased critical thinking and problem-solving skills. There could be lack of human interaction. Over-reliance on AI can reduce face-to-face interaction, potentially negatively impacting social skills. AI systems can perpetuate existing biases if trained on biased data, potentially disadvantaging certain student groups. It raises concerns about student data privacy, security, and potential misuse. It may automate certain teaching tasks, potentially displacing human educators. Access to AI-powered tools and resources may exacerbate existing inequities in education. Over-reliance on AI can lead to decreased resilience and adaptability in students. Based on the foregoing, It becomes prudent to study challenges of the use of artificial intelligence on academic performance among undergraduate students in public universities in Anambra State.

Research Questions

The following research questions guided the study:

1. In what ways do undergraduate students use Artificial Intelligence in public universities in Anambra State?
2. What are the consequences of the use of Artificial Intelligence on academic performance of undergraduate students in Anambra State Public Universities?
3. What are the possible solutions to ameliorate the abuse of Artificial Intelligence on academic performance of undergraduate students in Anambra State Public Universities

Methods

The descriptive survey design was adopted in the study. The population of the study consisted of all 400 level undergraduates of 2023/2024 in public universities in Anambra state. 400 level undergraduate students were used because many of them use artificial intelligence in doing their assignments, seminars and projects. The total is 23,621 comprising 12639 males and 10982 females. The sample of the study was 600 undergraduates. In composing the sample, Simple random sampling and multi stage sampling techniques were used to select two universities which include Nnamdi Azikiwe University, Awka, and Chukwuemeka Odumegwu University, Igbariam. Two faculties were sampled in each of the universities using simple random sampling technique, in each of the faculties, three departments were also sampled using simple random sampling. In each of the departments 100 students were sampled amounting to 600 undergraduates. The instrument used in collecting data for the study

was the structured questionnaire titled "Challenges of the Use of Artificial Intelligence for Academic Performance" (CUAIAP) questionnaire. The questionnaire was validated by three experts, two in the area of sociology of education and the other in measurement and evaluation, all in Nnamdi Azikiwe University, Awka. To establish the reliability of the instrument, trial testing method was used on 50 undergraduates of University of Nigeria Nsukka outside the study area. The reliability was calculated using Cronbach Alpha for each of the subsections. At the end of the analysis, the scores obtained were 0.81 0.79 and 0.83. The results showed high reliability of the instrument. The instrument has two parts, A and B. Part A sought personal information on the respondents. Part B sought information required to answer the research questions. It has 1, 2, and 3 and these were concerned with information regarding the research questions. A contains 9 items, B contains 10 items while part B contains 12 items, making a total of 31 items. The four point response mode of strongly Agreed (SA = 4 points), Agree (A = 3 points), Disagree (D = 2 points) and Strongly Disagree (SD = 1 point) was adopted in the study. The questionnaire was administered to the respondents by the researchers with the help of 20 research assistants, who were paired for each of the 10 faculties. Administration of the questionnaire was done during the first semester of 2023/2024 academic session. All copies of the questionnaire distributed were collected back because of on the spot delivery method and collection technique applied. Mean was use to analyze the data. The four point response mode used, informed the use of mean 2.50 as the cut-off point for decision. The decision rule was that mean scores of items of 2.50 and above were regarded as positives while mean scores below 2.50 were regarded as negative.

Results

Research Question 1: In what ways do undergraduate students use artificial intelligence in public universities in Anambra State?

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Table 1: Mean rating of respondents on the ways undergraduate students use artificial intelligence in public universities in Anambra State

S/N	QUESTIONNAIRE	$\bar{X}$	REMARKS
1.	Students use AI to generate essays, assignments, or projects without proper citation or understanding	2.97	Agreed
2.	Students use AI-powered tools to answer exam questions or complete assessments without knowledge or understanding.	2.83	Agreed
3.	Students pass off AI-generated content as their own work.	2.79	Agreed
4.	Students use AI to write essays or assignments for others.	2.86	Agreed
5.	Students rely too heavily on AI, rather than developing and using their own knowledge.	2.77	Agreed
6.	Students use AI-powered tools for malicious activities, such as generating fake news or propaganda.	2.76	Agreed
7.	Students rely too heavily on AI rather than developing their own critical thinking skills.	2.81	Agreed
8.	Students use AI in research without proper ethical considerations or citations.	2.96	Agreed
9.	Students use AI to generate fake academic certificates or transcripts.	2.82	Agreed
	total	**25.57**	
	Cluster x	**2.84**	**Agreed**

Data in Table 1, showed all the items (1, 2, 3, 4, 5, 6, 7, 8, and 9) were rated agreed by the respondents because they obtained mean score of 2.50 and above indicating agreed. On the whole the cluster mean was rated 2.84, it shows undergraduate students of Anambra State Public Universities misuse Artificial Intelligence.

Research Question 2: What are the consequences of the use of artificial intelligence on academic performance of undergraduate students in Anambra State Public Universities?

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Table 1: Mean rating of respondents on the consequences of the use of artificial intelligence on academic performance of undergraduate students in Anambra State Public Universities

S/N	QUESTIONNAIRE	$\bar{X}$	REMARKS
11.	Students relying too heavily on AI tools hinder their critical thinking and problem-solving skills.	2.80	Agreed
12.	Students using AI tools without understanding the underlying concepts can lead to superficial learning.	2.50	Agreed
13.	Overuse of AI tools by students reduces their motivation to learn and engage with course material.	2.60	Agreed
14.	Excessive use of AI tools by students facilitates academic dishonesty, such as generating essays or solving problems without effort.	2.82	Agreed
15.	AI tools may not fully understand the context of assignments, leading to inaccurate or irrelevant results for students.	2.60	Agreed
16.	Overuse of AI tools by students make them lack basic skills, such as mathematics or writing.	2.50	Agreed
17.	The way and manner students relying on AI tools stifle their creativity and original thinking.	2.80	Agreed
18.	AI tools is used to manipulate or falsify research results which affects their academic performance.	2.79	Agreed
19.	Overuse of AI tools distracts students from meaningful learning experiences.	2.88	Agreed
20.	Access to AI tools exacerbate existing inequities in learning among students.	2.97	Agreed
	total	**27.26**	
	Cluster x	**2.72**	**Agreed**

In Table 2, all the items (11, 12, 13, 14, 15, 16, 17, 18, 19, and 20) obtained mean score 2.50 and above indicating agreed. On the whole the mean of means was rated 2.72, it implies that all the above items in Table 2 are consequences of the use of artificial intelligence on academic performance of undergraduate students in Anambra State Public Universities

Research Question 3: What are the possible solutions to ameliorate the over use of artificial intelligence for academic performance of undergraduate students n Anambra State Public Universities

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Table 3: Mean rating of respondents on possible solutions to ameliorate the over use of artificial intelligence for academic performance of undergraduate students n Anambra State Public Universities

S/N	QUESTIONNAIRE	$\bar{X}$	REMARKS
21.	School authorities should provide for students workshops, tutorials, and guidance on how to effectively use AI tools for research, writing, and problem-solving.	2.86	Agreed
22.	School management should teach ethical considerations, such as avoiding academic dishonesty and properly citing AI-generated content.	3.01	Agreed
23.	Educational policy makers should integrate AI and machine learning concepts into course materials to enhance understanding and application.	2.60	Agreed
24.	Teachers should encourage students to think critically and develop problem-solving skills to complement AI tool usage.	2.88	Agreed
25.	School management should ensure equal access to AI tools, software, and hardware for all students.	3.00	Agreed
26.	Teachers should facilitate group projects and discussions to promote shared knowledge and best practices in AI tool usage.	2.90	Agreed
27.	Government should support clubs, hackathons, and competitions that focus on AI and machine learning.	2.56	Agreed
28	Teachers should utilize AI to provide personalized feedback and adaptive assessments for students.	2.79	Agreed
29	Teachers should encourage students to apply AI tools across multiple subjects and disciplines.	2.88	Agreed
30	School authorities should regularly assess the impact of AI tools on academic performance and adjust strategies accordingly.	3.12	Agreed
31	Government should ensure educators are knowledgeable about AI tools and effective integration strategies so that they can guide students accordingly.	2.94	Agreed
32	School authorities should ensure equal access to AI tools and resources for all students, regardless of background or ability.	2.71	Agreed
	Total	**34.25**	
	cluster x	**2.85**	**Agreed**

In Table 3, items (21, 22, 23, 24, 25, 26, 27, 28, 29, 30 31 and 32) were rated agreed by the respondents. On the whole the grand mean score was rated 2.85, this implies that all the items in table 3 are possible solutions

to ameliorate the over use of artificial intelligence for academic performance of undergraduate students n Anambra State Public Universities.

Discussion

The findings of the study showed that undergraduate students in public universities in Anambra State misuse Artificial Intelligence. This is because students use AI to generate essays, assignments, or projects without proper citation or understanding and they use AI-powered tools to answer exam questions or complete assessments without knowledge or understanding. Findings also showed that some students pass off AI-generated content as their own work. Students rely too heavily on AI, and they use AI to generate fake academic certificates or transcripts and spread false information or propaganda. To support these findings, Omame and Alex, (2020), supported that students using Artificial Intelligence (AI) to write exams is a growing concern in academic integrity. This can include: using AI tools to generate answers to exam questions, potentially without understanding the content. Muayyad and Maha (2024) also agreed that students utilize AI-powered tools to write entire essays or assignments, potentially passing them off as their own work and they rely on AI-powered chatbots or tutoring tools to complete assignments or answer exam questions without proper understanding.

In addition, the findings of the study showed that Artificial Intelligence negatively affects academic performance of undergraduates' in public universities in Anambra State. This is because undergraduate students in Anambra state public universities are abusing the use of artificial intelligence. To support this result, Anyanwu and Igwe (2017) supported that AI still fail to detect integral elements of the educational process such as irony, sarcasm, and humor that can highly be contributive to the learning process of students; this affects academic performance. Similarly, Nwosu and Okoye (2019), agreed that artificial intelligence has negative impact on academic performance of undergraduates because of the way and manner they make use of artificial intelligence tools. In addition, this result is in consonance with the findings by Davenport and Ronanki (2018), that Nigerian undergraduate students use AI negatively, stressing that they use AI-powered chatbots to provide answers during online exams, generate essays, solve complex math problems, and also analyze past exams and predict future questions, giving some students an unfair advantage. All these affect academic performance of undergraduate students. Hence, the

consequences of the use of AI on academic performance of undergraduates are devastating and needs to be addressed.

Finally, the findings of the study revealed some measures to enhance the use of artificial intelligence among undergraduate students in Anambra state public universities. In this regard, the findings showed that school authorities should provide for students workshops, tutorials, and guidance on how to effectively use AI tools for research, writing, and problem-solving and also teach ethical considerations, such as avoiding academic dishonesty and properly citing AI-generated content. Similarly, the findings by Muayyad and Maha (2024) agreed that the school authorities providing students with workshops, tutorials, and guidance on how to effectively use AI tools will reduce the negative effects of AI on them. The findings of the study showed that educational policy makers should integrate AI and machine learning concepts into course materials to enhance understanding and application and students should think critically and develop problem-solving skills to complement AI tool usage. Also, school management should ensure equal access to AI tools, software, and hardware for all students and school authorities should regularly assess the impact of AI tools on academic performance and adjust strategies accordingly among others. To support these findings Bitcoin Forum (2024) supported that curriculum planners integrate AI and machine learning concepts into course materials to enhance understanding and application. In addition, Oyekale and Zubairu (2022), supported that school management should set up suitable panel that would regularly assess the impact of AI tools on academic performance among undergraduates in public universities in Nigeria. It is interesting to determine the possible solutions to address the consequences of AI on academic performance of undergraduate students in Anambra state universities.

Conclusion

The study assessed the challenges of the use of artificial intelligence on academic performance of undergraduate students in public universities in Anambra state. It is clear that the way and manner undergraduate students in Anambra state public universities make use of Artificial Intelligence differ from the way students in developed countries make use of it. The worse of it all is that they use it for examination malpractices, and students no longer study as required. All these make them to perform below expectations in their academic activities. This led to the conclusion

that the misuse of artificial intelligence tools by undergraduate students of Anambra state universities affects their academic performance negatively. However, Government, teachers, students among other educational stakeholders have significant role to play in addressing this problem which if neglected will eat deep into the fabric of Nigeria's educational system and products. By implementing the measures mapped out in this study, undergraduates can effectively harness the power of AI to enhance their academic performance and prepare for a future where AI is increasingly prevalent.

Implications to Societal development

The study showed that the misuse of AI affects academic performance of undergraduate students. It is crucial for educators and policymakers to address the implication and promote responsible AI integration in education that would emphasize on ethical use of AI, digital literacy, and balanced learning approaches. This is because using AI tools for academic dishonesty could lead to penalties, such as: brain drain, loss of credits, or even expulsion. It is clear that overreliance on AI tools hinders students' academic engagement and the development of essential skills. Relying on AI tools without understanding the underlying concepts could lead to superficial knowledge. Misusing AI tools could also impact future academic and professional opportunities, as well as personal growth and development. In this regard, all educational stakeholders are encouraged to monitor the students and restrict them from misuse of artificial intelligence as it negatively affects their academic performance in school.

Recommendations

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

1. Government and school management in public universities should implement AI tools in a way that complements traditional learning methods, to promote a balanced approach to education.
2. Curriculum planners should incorporate digital literacy training into curricula to educate students about responsible AI tool usage, online safety, and ethical considerations.
3. Teachers in public universities should encourage students to focus in developing their critical thinking and problem-solving skills. This would ensure that students utilize AI tools without relying solely on them.
4. School authorities should establish clear ethical guidelines for AI tool usage, by addressing

issues like academic dishonesty and unethical advantage.

5. School authorities should maintain face-to-face interaction and social skills development through group projects, discussions, and extracurricular activities and regularly assess the impact of AI tools on academic performance and adjust integration strategies accordingly.
6. Educational institutions should implement anti-plagiarism software and use AI-detection tools to identify potential cheating, develop new assessment methods, like oral exams or projects, increase human proctoring and surveillance.

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