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AN EVALUATION OF APPLICATION OF GENERATIVE ARTIFICIAL INTELLIGENCE IN ASSESSMENT AND RESEARCH PRACTICES AMONG POST GRADUATE STUDENTS OF PUBLIC TERTIARY INSTITUTIONS IN CROSS RIVER STATE, NIGERIA

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Abstract

This study examined the application of generative artificial intelligence in assessment and research practices among postgraduate students in public tertiary institutions in Cross River State, Nigeria. The study employed four research questions, while the design accepted Instrumentation. Three hundred (300) students were selected from the population of 3,000 postgraduate students using a combination of stratified and random sampling procedures. The Generative Artificial Intelligence in Assessment and Research Practices Questionnaire (GAIARPQ) was the main instrument utilised. Experts in measurement and evaluation from the University of Calabar assisted in scale construction and validation. The reliability estimate was obtained via Cronbach's Alpha to ascertain its internal consistency. The reliability coefficient ranges from 0.78 to 0.86. The statistics included percentages, means, and standard deviations for the four research questions. Outcome of the analysis revealed that, GAI is applicable to: clarification and answers to demands and speedy text, translation across languages were low; version creation in various exhibition forms and analysis and summary of facts in different patterns of assessment and research practices among post graduate students of the universities in CRS, Nigeria were significantly low.

Keywords: Generative Artificial Intelligence, Assessment, Research Practices, Analysis.

Introduction

Generative Artificial Intelligence (AI) is a comparatively new phase of AI. Unlike its pioneers, it can produce fresh content by inferring from its training data. Generative AI can be referred to by various acronyms, including Gen AI, GAI, or Generative AI (Newson & Weber, 2023). These ideas always create results as feedback to precise reminders or prompts. The systems can study the fundamental configuration and organisation of their training data, empowering them to generate original data (Metz, 2023).

Generative Artificial Intelligence (Gen AI) is another intriguing form of Artificial Intelligence (AI) that remains largely unexplored by scholars worldwide. Dwevedi, Kshetri, Huges, Shade, Jeyaraj, Kar, and Wright (2023) identified Generative Artificial Intelligence (GAI) as intending to provide the following services:

1. Interpretation and response to questions and prompts.
2. Translation across languages.
3. Text generation in different presentation forms
4. Analysis and summary of data in various forms.

One must be appropriately guided and cautioned when studying research using artificial intelligence (AI). It is observed that the application of AI in learning can be both demanding and challenging, particularly in assessment and research practices. Wang and Cheng (2021) opine that "learning from AI may lead to bionic humans, whereas learning about AI may lead to humans with dual expertise AI and learning with AI may lead to intelligent educational robots". However, the viewpoint of people, whether as novices or due to a lack of knowledge on the application of artificial intelligence, may result in a futile effort to facilitate instructors and students in educational settings, as well as conducting research in educational institutions that meets the standards.

Artificial Intelligence experienced a boom in Generative Artificial Intelligence systems in the early 2020s, with improvements to transformer-based deep neural networks via large Language models (LLMs). The new wave in GAI, as stated by scholars, was Chatbots, which consist of "Chat GPT, Copilot, Gemini and Llama, text-to-image artificial intelligence image generation systems such as Stable, Diffusion, Mid-journey and DALL-E, and text-video AI generation such as Sora" (Metz, 2024; Roose, 2022; Yang & Gokturk, 2023; Brynjofsson, Erik, Li Danielle and Lindsey, 2023; Thoppilan, De Frietas, James, Shazeer and Kulshreshtha, 2022). Numerous companies, including OpenAI, Baidu, Anthropic, Microsoft, and Google, have developed GPT-4. The scholars stressed the relevance of "Gen AI in industries together with software development, health care, funding, leisure, customer facilities, retail, advertisement, drawing/painting, writing, and product design".

Artificial intelligence refers to the replication of human intellect through sophisticated engines and computer systems. These procedures involve education, mental problem-solving, and language comprehension (Russell & Norvig, 2016). In education, AI operations such as "plagiarism detection tools, data analytics software, and virtual research assistants have revolutionised how students conduct research and complete assessments". The potential of AI to influence assessment and research practices is profound. For instance, it enables personalised learning by identifying individual strengths and weaknesses. It also enhances research efficiency through automated data collection and analysis, enabling postgraduates to focus on interpretation and critical thinking. AI-powered tools, such as Turnitin and Grammarly, help ensure academic integrity and improve writing quality, addressing common challenges in postgraduate education (Holmes et al., 2019). Despite the administrative struggles and educational stakeholders ' efforts to improve postgraduate education through funding and curriculum reforms, these initiatives have yielded limited results. The persistent issues of ineffective assessment and poor research

practices hinder academic excellence, stifle innovation, and compromise the integrity of Nigeria's higher education system.

Generative AI applications in assessment and research practices could help in evaluating Diffusion Model used in image and video generation, produce photo realistic gallery, generating images for painting and drawings, operating on two separate algorithms referred to as generator and discriminator, sentiment analysis, other tools for computer vision etc. (Hooda. Rama, Dahiya, Hossain and Riman; 2022; Pasick, 2023; Metz, 2023; Roose, 2022; Metz, 2024). Chan and Hu (2023) explore learners' voices on GAI, their perceptions, benefits, and the problems they encounter in colleges. The first-degree and postgraduate scholars were 399 from various departments in Hong Kong, who reported generally encouraging behaviour towards Gen AI in their education. Descriptive statistics were employed to address the research questions. This investigation employed a thematic methodology for analysing the open-ended questions provided by the respondents. The model utilised was John Briggs's 3P Model, which shows that students' perceptions significantly influence the outcome of learning approaches.

Saude, Barros, and Almeida (2024) investigated the impact of Gen AI in tertiary institutions, with a particular focus on research trends and students' perceptions, employing an exploratory strategy. A bibliometric analysis of 64 published works in Scopus and Web of Science formed the basis of a systematic review for this study. Additionally, 112 students participated in this research by completing questionnaires. The findings reveal that GAI enhances academic effort and knowledge feedback, promoting radical, principled, and digital literacy proficiencies.

Alimi, Buriamoh. Aladesusi and Omolafe (2015) conducted empirical research on the accessibility and utilisation of artificial intelligence by tertiary education learners in Kwara State. Descriptive and inferential statistics were applied. A three-sectional questionnaire was adopted to elicit information from the participants in this study. The sample consisted of 200 undergraduates from various institutions of higher learning. Reports from the study indicate that many students are unaware of the role of artificial intelligence in their academic pursuits. The outcome specifies that many undergraduates are unproductive and untrained in using GAI.

Asongo, Akuse, and Aza (2024) conducted research among postgraduate students in Benue State, Nigeria. They aimed to use an artificial intelligence test for enhanced research. A descriptive survey research design and a sample of 231 postgraduate students were selected for data collection. The questionnaire constructed was the Awareness and Utilisation of AI Tool. Descriptive statistics were employed for analysis. The utilisation level among postgraduate students has a significant mean difference in their ratings.

Similarly, Mohammed and Shehu (2023) review the challenges and prospects of Explainable AI, with a case study of Nigeria. The researcher accepted and allowed the narrative review to outline issues in artificial intelligence affecting four relevant subdivisions: health, agriculture, energy and finance. The researchers gathered information from secondary sources and journals to form their opinions. The study's outcome was not encouraging. AI in educational contexts involves utilising knowledge

in computers, ordinary language applications, and computational algorithms to automate, enhance, and streamline tasks such as interpreting responses, translating languages, generating content, and analysing data (Chen et al., 2020).

Ideally, postgraduate students must demonstrate proficiency in research design, data collection, critical analysis, and academic writing. They should also demonstrate a high level of intellectual autonomy and make significant contributions to the body of knowledge in their respective disciplines. Unfortunately, many Nigerian students fail to meet these expectations due to systemic challenges in the educational sector. Despite various determinants influencing assessment and research practices, this study focuses on the role of GAI, which has gained prominence as an engine for change in schools and can enhance assessment processes and research practices. It provides automated feedback, improves data analysis, and facilitates access to a wealth of resources, making it an indispensable tool for modern research (Chen et al., 2020). It will not be long before teachers and lecturers may reconsider how learners are evaluated. This study serves as a wake-up call for current assessments to adopt modern and advanced approaches, which should also integrate Generative Artificial Intelligence.

The consequences of these challenges are far-reaching. Graduates who lack adequate research skills are poorly equipped for the demands of academia and industry, resulting in a decline in national development. Additionally, substandard research outputs diminish Nigeria's global academic standing. “The Federal Government of Nigeria” (2013) emphasises the importance of academics as the driving force for nationwide progress, underscoring the urgency of addressing these challenges. Given this context, there is an urgent need to combat the issues of ineffective assessment and poor research practices. The paper examines the application of artificial intelligence to solve these challenges, focusing on its potential to revolutionise assessment and research practices among postgraduate students in Nigerian public tertiary institutions. On the other hand, the researchers in this study has not lost sight of the negative handling of GAI ranging from cybercrime, academic dishonesty due to plagiarism, kidnapping, theft, fake news generation to control and misguide humans as well as job replacement of humans by robots which might increase, unemployment, terrorism and suicide bombing.

Research Questions

The research questions answered are:

1. To what degree are Generative Artificial Intelligence (GAI) applications used for interpretation and response to questions and prompts in assessment and research practices?
2. What is the level of Generative Artificial Intelligence (GAI) applications to translation across languages in assessment and research practices?
3. To what extent is the level of Generative AI applications for text generation on different presentation forms for assessment and research practices?
4. What is the application level of Generative Artificial Intelligence (GAI) for enhancing analysis and summary of data in assessment and research practices?

Methodology

The strategic plan that directs this investigation was the instrumentation as the design. The selection was made from the faculties of education, arts, and social sciences,

using the stratified random sampling technique. Ten percent was used to select the sample from the population of 3,000 postgraduate students of Cross River State universities in Nigeria. The researchers used the University of Calabar (UNICAL), which has a total of 1,950 students, while the University of Cross River State (UNICROSS) has 1,050 students. A sample of three hundred (300) students was selected via a random sampling process. The Generative Artificial Intelligence in Assessment and Research Practices Questionnaire (GAIARPQ) was a self-developed questionnaire used to obtain information. Face validation was conducted by professionals in research, measurement, and evaluation from the University of Calabar. The Cronbach Alpha reliability method was applied, and its coefficient ranges from 0.78 to 0.86. The statistics used were frequency counts, percentages, and mean and standard deviation.

Results

The results presented in Tables 1 to 4 reveal the extent to which Generative Artificial Intelligence (Gen AI) applications are used among postgraduate scholars of government-owned universities in Cross River State, Nigeria. The abbreviation APP stands for "Application of GAI," while "NO APP" indicates that GAI is not applicable; instead, it is low.

Research question one: To what extent is Generative Artificial Intelligence (GAI) applied to interpretation and response to questions and prompts in assessment and research practices?

Table 1: Summary of postgraduate students' responses in their percentages, means and standard deviation of Generative Artificial Intelligence (GAI) applications to the level of interpretation and responses to questions and prompts in assessment and research practices

ITEMS	APP		NO APP	
	N	%	N	%
1. I am familiar with diffusion GAI models	53	17.7	247	82.3
2. I can use DALL-E to create a photo.	45	15.0	255	85.0
3. I can use open AI Sora Models	43	14.3	257	85.7
4. I use GAI to create and imitate paintings	40	13.3	260	86.7
5. I apply the generator when using GAI. to create realistic content	47	15.7	253	84.3
6. I can apply the discriminator in GAI to determine whether real or not	38	12.7	262	87.3
7. I used AI tools in tutorial-type dialogue for summary of current knowledge for assessment.	65	21.6	235	78.4

Research Question One presented a summary of postgraduate students in terms of their percentages, means, and standard deviations of the application level of interpretation and

responses to questions and prompts in assessment and research practices. Table 2 presents a tabular arrangement of postgraduate students' responses regarding GAI applications, the percentage of non-applications, and their mean and standard deviation for text generation across different presentation forms in assessment and research practices. For instance, in item 1, only 53 students are familiar with diffusion GAI models, while 247 are not. This applies to the use of DALL-E in item 2 (43 students apply while 257 are novices) and so on, making it very low.

Research Question Two: What is the application level of Generative Artificial Intelligence (GAI) for translation across languages in assessment and research practices?

Table 2: Summary of postgraduate students' responses to percentages, means and standard deviation of Generative Artificial Intelligence (GAI) applications on the translation level across languages in assessment and research practices.

ITEMS	APP		NO APP	
	N	%	N	%
8. I do have understanding in operating with large language models (LLMs)	40	10.5	260	89.5
9. I have worked with neural networks with huge data	32	10.7	268	89.3
10. I can apply Chat GPT in assessment and research practices	189	63.0	111	37.0
11. I used Claude to create data that predict the next words in any give sequence	63	21.0	237	79.0
12. Some GAI models help me during the design process	144	48.0	156	52.0
13. I do operate with Capilot to perform some specific task	88	29.3	212	70.7
14. With GANs I can generate pictures	64	21.3	236	78.7
15. I have used GANS to produce videos for computer vision.	42	14.0	258	86.0
16. I am familiar with text and sound using certain GAI tools in research practices	75	25.0	225	75.0

Table 2 summarises the percentages, means, and standard deviations of postgraduate students' GAI applications on the translation level across languages in assessment and research practices. Nine statements were raised; 40 students operate with LLMs, whereas 260 do not, as indicated in item 8. Item 9 indicated that 32 students had worked with neural networks, while 268 did not. Item numbers 10 and 12 indicate moderate GAI applications, while others reported low in assessment and research practices to enhance quality education.

Research question three: To what extent is the level of Generative Artificial Intelligence (GAI) applications to text generation on different presentation forms for assessment and research practices?

Table 3 summarises the percentages, means, and standard deviations of postgraduate students' text generation application on different presentations. Items 17–22 demonstrate the level of students' application of Gen AI.

Table 3: Summary of postgraduate students' responses in their percentages, means and standard deviation of GAI applications to text generation on different presentation forms in assessment and research practices.

ITEMS	APP		NO APP	
	N	%	N	%
17. I applied Gen AI to create different text generation presentation form	88	29.3	212	70.7
18. I use AI to provide games for solving problems.	78	26.0	222	74.0
19. There are GAI tools I used in teaching to get feedback during assessment	69	23.0	231	77.0
20. Gen AI applications assisted me to generate course content for assessment and research.	86	28.3	214	71.7
21. GAI tools guide learners to know specific tasks.	105	35.0	195	65.0
22. I used Gen AI in creating visual and audio multimedia.	132	44.0	163	56.0

Table 3 shows that very few postgraduate students responded to the use of Gen AI tools: Item 17 had 88 responses, Item 18 had 78 responses, Item 19 had 69 responses, Item 20 had 86 responses, Item 21 had 105 responses, and Item 22 had 132 responses, respectively. Others showed NO APP for assessment and research practices; hence, it was low.

Research question four: What is the level of application of Generative Artificial Intelligence (GAI) for enhancing analysis and summary of data in assessment and research practices?

Table 4: Summary of postgraduate students' responses in their percentages, means and standard deviation of Generative Artificial Intelligence (GAI) applications for analysis and summary of data in assessment and research practices.

ITEMS	APP		NO APP	
	N	%	N	%
23. I use AI tools to play with data.	136	45.0	164	55.0
24. Gen.AI is used by me to produce output in assessment and research.	128	42.0	172	57.0
25. I use GAI tools for analyzing data.	89	29.7	211	70.3
26. Copilot tool is used by me to perform some research practices task	80	26.6	220	73.4
27. I utilized Gemini tools for clarifying concepts.	85	28.3	215	21.7

28. AI has been used by me in writing and summarizing academic literature	93	31.0	207	69.0

Table 4 presents a summary of the percentages, mean, and standard deviation of responses to information that measures GAI application to analysis, as well as a summary of data for assessment and research practices. Item 23(136) had moderate applications, and item 24 (128) was fair. Items 25 and 29 were low, especially when utilising GAI such as Copilot and Gemini. The percentages for items 25 (29.7%), 26 (26.6%), and 27 (28.3%) were very low.

Discussion

The analysis revealed that GAI applications to "interpretation and response to questions and text prompts" and "translation across languages" were low. Additionally, the creation of text in various presenting formats and the analysis and interpretation of information in different assessment and research practices among scholars in government-owned universities in the country were significantly low. In contrast, some researchers note that scholars also have access to these indicators and can modify the generated text to make it unnoticeable. Adefuye, Omoyajowo, Oputa, Omojola, and Olusanjo (2023) reported a positive and significant association between attitude and perception, as well as the utilisation of ChatGPT, among postgraduate scholars at the University of Ibadan. On the other hand, the low applications of GAI in this study may be due to misconceptions, inadequate training in AI, and noncompliance with AI tools.

The findings, therefore, indicate that there is a need to start embracing the fast-shifting technological innovations of GAI applications in institutions of learning and integrate these developments into the new era of academic endeavours. Furthermore, a firm such as Microsoft has been trying to combine Chat GPT universally into its products (Rudolph et al., 2023; Warren, 2023), it will not be long Chat GPT will be conservative, and it might be perhaps, dawn for institutions of learning to reconsider their programmes and objectives of their practices to direct aa well as sustain learners in using ChatGPT securely and practically.

Conducting educational research to solve problems and student assessment practices remain paramount in our educational system. This is drifting towards the various approaches, techniques and procedures used to evaluate scholars. Dynamic measures in research and assessment practices are steadily taking over the traditional and archaic ways of measurement and evaluation. Bakare, Oladokun, Quadri, and Idowu-Davies (2023) emphasise the relevance of Gen AI devices, especially ChatGPT, for modifying and changing their viewpoint. In addition, the scholars address some abnormalities or misinterpretations associated with AI tools that may pose challenges to the broader acceptance of current best practices in our educational scenario.

Several existing scholarly works have established that most educators lack adequate skills in involvement in more advanced research and assessment practices that can accelerate learning processes. On that note, stakeholders have steadily requested the commitment of facilitators and teachers. Their emphasis is to advance in first-class assessment procedures in their learners. With the involvement of proficient capacity structures, especially in AI, significant academic progress can be made through educators to enhance the supremacy of ChatGPT and other GAI, such as copilots, Gemini, GANs, Claude, and LLM devices. This aims to create a platform that utilises excellent assessment practices to enhance learners' academic performance and proficiency in GAI applications. Stojanov (2023), in agreement, stated that Gen AI

technologies play a significant part in transforming education, particularly in their ability to tailor education to individual needs.

The findings of this study indicate that postgraduate students utilise generative artificial intelligence, although the applications are limited. The researchers emphasize the need for students' active application and support the opinion of Baidoo-Anu and Owusu Ansah (2023), who confirmed that 'ChatGPT and other generative AI are spreading didactic frontlines that are setting the pace for renovation and revision in the institutions.

Conclusion and Recommendations

Generative Artificial Intelligence (Gen AI) tools have been seen as a standard to adopt, offering innovations and creativity that need to be incorporated carefully and proficiently to create a networking connection between Nigeria and the Western world. This study calls for modernising education with advanced scientific technologies and visions in educational settings, aimed at addressing modern social needs and providing solutions to students' problems. The following recommendations were made:

1. A manuscript/textbook for Gen AI tools is crucial for students' use.
2. Stakeholders should formulate and implement policies for the positive use of AI, while also banning the negative use of AI.
3. Seminars and workshops on professionalism and skill acquisition for teachers in Nigeria should be organised to promote the efficient utilisation of GAI tools.
4. There is a need for the inclusion of GAI into teaching and learning in academic programmes.

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