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Research Article

IMPACT OF GENERATIVE ARTIFICIAL INTELLIGENCE ON TEACHING AND LEARNING OF EDUCATIONAL TECHNOLOGY IN NIGERIAN UNIVERSITIES FOR SUSTAINABLE DEVELOPMENT

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ABSTRACT

The adoption of Generative Artificial Intelligence (GAI) in teaching and learning in Nigerian Universities has great potential in enhancing national sustainable development. The study examined the impact of GAI on teaching and learning of Educational Technology in the Nigerian universities. The descriptive research design of the survey type was employed. A multi-stage sampling method was employed, and 1200 Educational Technology students were drawn from the total population of 12 public Universities from the six geopolitical zones of Nigeria. An instrument with a reliability coefficient of 0.87 was used to gather data which were then subjected to analysis of mean, standard deviation and paired samples t-test for 0.05 level of significance. The findings showed high level of awareness of GAI tools by students (cluster mean = 3.28) and relatively high digital literacy skills (cluster mean = 3.03). Students also demonstrated high level of use of GAI tools in academic activities (cluster mean = 3.11) especially in research work (mean = 3.26) and summarising lecture content (mean = 3.21). The significant obstacles observed include cost of data (mean = 3.32), poor internet connectivity (mean = 3.19) and accuracy of information generated by AI (mean = 3.12). As for the difference between the digital literacy skills of students and their usage of GAI tools, a statistically significant difference was reported, $t(1199) = -3.20$, $p = .001$. Based on the findings, it was recommended that University management should organize digital literacy workshops periodically to boost prompt-writing, information-verification and ethical-use skills to facilitate effective learning.

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1. Introduction

The rapid advancement of emerging technological innovations brought significant transformation to education particularly teaching and learning process. The most recent being Generative Artificial Intelligence tools which has gained global recognition due to its ability to generate responses, explain concepts, summarise information, suggest learning activities, learning resources, create human-like text, images, audio and videos differ from many

traditional educational technologies' tools which primarily store, retrieve and present information. These Generative Artificial Intelligence (GAI) tools like ChatGPT, Google Gemini, Grok, DeepSeek, Claude and other AI-powered Learning Management Systems are increasingly influencing teaching, learning, research and administrative matters. Students can use GAI tools as a prompt to explain abstract concept, provide example or suggest activities. GAI tools can respond to individual learners' needs and learning speed more effectively than conventional method. Generative AI helps reduce academic workload and allow learners to focus more on creativity, critical thinking, Problem-solving, student engagement and personalized support (Adebayo, 2024).

Educational technology is not only concerned with the use of electronic devices but also with the systematic design, development, implementation, and evaluation of teaching and learning processes. Generative Artificial Intelligence (GAI) tools have the potential to strengthen Educational Technology as a programme by supporting instructional design, educational media production, assessment, research activities and technology-supported classroom interaction. The relevance of teaching with GAI tools is particularly important because teaching Educational Technology courses in Nigerian universities face some challenges like overcrowded classrooms, insufficient instructional resources, limited access to e-learning materials, infrastructural decay, internet connectivity and students and teachers' digital competencies. GAI tools, if appropriately integrated in the teaching of Educational Technology, will likely assist the development of learning resources more efficiently and provide students with additional learning support. It will also encourage students' independent learning, creativity, critical thinking and problem-solving.

Educational Technology programmes in Nigerian universities are expected to prepare students to understand, design, produce, manage, learn with instructional materials, digital resources and evaluate instructional resources and technology-supported learning environments with innovative methods to improve their knowledge. Learning Educational Technology with GAI tools presents new opportunities for instructional innovation, learner engagement, curriculum development and research activities in the universities (Adeoye, Adanike & Adaniki 2025). The use of GAI tools in teaching Educational Technology contributes to sustainable development in many ways like in human capital development (Aremu and Olatunji 2025). They help in equipping students with modern technological skills, employability innovation skills require in the digital workforce (world Economic Forum, 2025) Sustainable Development Goal SDG emphasises universal access to quality education, equity, inclusion, literacy, teacher quality and lifelong learning.

The teaching and learning of Educational Technology provide an appropriate environment for developing digital competencies. For instance, students can learn how to formulate effective prompts, assess the reliability of AI-generated information, identify possible bias and acknowledge AI assistance in academic work. Students can use GAI for academic research, brainstorm ideas, generate and organize literature review themes, organize tasks and improve written expression.

Sustainable development refers to development that meets the present needs without compromising the ability of future generations to meet their own needs. It encourages people to make a sound responsible choices that help create a better future. Sustainability involves accessible, equitable, relevant and quality learning opportunities that prepares individuals to

contribute meaningfully to society. Education is central to sustainable development, social inclusion and economic growth. The United Nations 2030 Agenda for Sustainable development identifies quality education as Sustainable Development Goal 4 (SDG 4). The goal emphasizes inclusive and equitable quality education and promotion of lifelong learning opportunities for all (United Nations, 2015). UNESCO (2024) states that the teaching of educational technology with GAI tools is a source of contribution to Sustainable Development Goals (SDGs) especially SDG 4 (Quality Education). UNESCO argues that educational technology helps nations of the world improve workforce readiness, research activities and global competitiveness.

However, teaching and learning in many Nigerian Universities is observed to be conventional method (teacher-centred) which is characterized by heavy content and rote-based learning hence there is a clarion call for a shift to other methods to cater for the yearnings of the 21st century learners and promote skills development and competencies. Okeke and Eze (2024), observed that many Nigerian universities lack adequate technological facilities like functional computer laboratories, smart classrooms, among others. This observation was corroborated by UNESCO (2024) that many challenges hinder effective teaching and learning with emerging technologies in Nigerian Universities such as poor power supply and inadequate skilled manpower who lacked adequate digital pedagogy. Furthermore, graduate unemployment is one of the most pressing socioeconomic problems facing nations of the world, Nigeria in inclusive.

The National Bureau of Statistics and various labour market analysts have consistently raised an alarm over rising unemployment rates especially among young graduates turned out every from universities. One of the reasons advanced for this was mismatch between skills and competencies demanded by the 21st century labour force. The question is should a graduate of educational technology lack these skills and competencies by virtue of what the discipline entails? A graduate of Educational Technology is not only expected to acquire digital skills competencies to enable him function in the labour market but to be self-reliant. But observation has shown that most of them are also on the queue.

The integrating GAI tools into teaching of Educational Technology provide a strong platform for skills acquisition and development of competencies. The dominance of traditional method (teacher-centred) which is characterized by rote learning and memorization is gradually being eroded to give way to modern instruction (learner-centered) as a result of COVID 19 Pandemic of 2020. This shift reflected on the increasing potential of Educational Technology as a powerful programme for practice to promote skills acquisition for sustainable development. Gaps still exist despite these opportunities hence the paper examines impact of GAI on teaching and learning of Educational Technology in Nigerian universities and its implication for national sustainable development.

2. Statement of the Problem

There is a growing recognition that paper qualifications alone are no longer sufficient to guarantee meaningful gainful employment rather graduates need to possess employability skills to enable them function effectively in today workforce and contribute to sustainable development. Today world of work requires digital competence, innovation and ability to work with emerging technologies. Students of Educational Technology are also expected to understand how GAI can be applied to instructional design, production of educational media,

e-learning development and learning management. Students exposed to GAI tools is expected to be able to prepare educational content development and instructional design. They are expected to learn in well-equipped digital environments in the 21st century classroom but the current situation in Nigerian Universities failed to meet the expectation. Hence the work force is devoid of adequate graduates who possess employability skills. Educational Technology programme in many Nigerian universities operate under inadequate equipment and facilities that limit opportunities for practical, hands-on instruction that the discipline requires. These infrastructural decay and poor learning environments reduce opportunities for active learning thereby undermining students' skills acquisition to participate in today work force. This gap leaves universities students without evidence-based guidance on how GAI tools can augment limited equipment and essential skills to contribute to sustainable development. Therefore, this study examines impact of Generative Artificial Intelligence tools on teaching and learning of Educational Technology programme for sustainable development in Nigerian Universities.

4. Purpose of the Study

The main purpose of this study was to examine the impact of Generative Artificial Intelligence tools on the teaching and learning of Educational Technology for sustainable development in Nigerian universities. Specifically, the study sought to:

i. assess students' awareness of Generative Artificial Intelligence (GAI) tools in the teaching and learning of Educational Technology for sustainable development in Nigerian universities;
ii. investigate students' digital literacy skills in the use of GAI tools for learning Educational Technology in Nigerian universities;
iii. examine the extent to which students utilize GAI tools in learning Educational Technology in Nigerian universities; and
iv. identify the challenges associated with the use of GAI tools in the learning of Educational Technology in Nigerian universities.

5. Research Questions

The study will be guided by the following research questions:

1. What is the level of students' awareness of Generative Artificial Intelligence (GAI) tools in the teaching and learning of Educational Technology for sustainable development in Nigerian universities?
2. What is the level of students' digital literacy skills in the use of GAI tools for learning Educational Technology in Nigerian universities?
3. To what extent do students use GAI tools in learning Educational Technology in Nigerian universities?
4. What are the challenges associated with the use of GAI tools in the learning of Educational Technology in Nigerian universities?

6. Research Hypotheses

The following hypotheses are formulated to guide this study:

1. There is no significant difference between students' digital literacy skills and the use of Generative Artificial Intelligence (GAI) tools in learning Educational Technology in Nigerian universities.

7. Methodology

This study adopted a descriptive research design of the survey type. This design was deemed suitable because it allowed the researcher to sample educational technology students from public universities in Nigeria to describe their awareness, digital literacy competencies, their use of Generative Artificial Intelligence (GAI) tools and problems encountered when using them. The population of the study was all the students in the Educational Technology programmes of the 12 public universities in the six geopolitical zones of Nigeria. The sample for the study consisted of 1200 Educational Technology students selected from the 12 public universities in the six geopolitical zones of Nigeria using a multi-stage sampling technique from North-Central, North-East, North-West, South-East, South-South and South-West Zone. A proportionate simple random sampling method was used to obtain 100 students per university with a total sample of 1200 students at the second stage. The use of multistage sampling technique was considered appropriate considering that the study population was spread across Nigeria where it was not possible to select the respondents directly from a national sampling frame.

The process allowed the researcher to sort the selection process geographically and by university, before choosing individual students. Random selection was also used at the last phase, which reduced the selection bias among eligible students in the selected Universities. The instrument for collection of data was questionnaire titled "Teaching and Learning Educational Technology with Generative Artificial Intelligence Tools" (TLETGAITQ) designed by the researcher. The aim of the questionnaire was to gather data from Educational Technology students at Nigerian public universities on awareness, skills in using Generative Artificial Intelligence (GAI) tools, challenges encountered in the use of GAI tools in learning Educational Technology. The questions in the questionnaire were segmented into four sections: A-D, where section A sought awareness about the GAI tools, section B, the student's digital skills, section C was students' use of GAI tools in their learning of Educational Technology while Section D focused on the challenges of using the GAI tools. Items in sections A-D were evaluated on a 4-point Likert scale ranging from Strongly Agree (4 points), Agree (3 points), Disagree (2 points) and Strongly Disagree (1 point). Face and content validity of instrument was ascertained by experts in Educational Technology and Test and Measurement. They evaluated the clarity, relevance and sufficiency of the items and the recommendations provided were applied to enhance the instrument for the study. Reliability of the instrument was tested in a pilot study with 50 non-participants in the main study.

The internal consistency of the instrument was satisfactory with a coefficient of reliability of Cronbach's alpha (α) = 0.87. The questionnaire was distributed to the 1,200 respondents in the 12 public universities in Nigeria with the assistance of the appointed contacts. The response rate was 100% with all 1200 questionnaires completed and returned. Descriptive statistics of (mean and standard deviation) were used in the analysis of the data to answer the research

questions while the research hypothesis was tested at 0.05 level of significance by a paired-samples t-test.

8. Results

Research Question 1: What is the level of students' awareness of Generative Artificial Intelligence (GAI) tools in the teaching and learning of Educational Technology for sustainable development in Nigerian universities?

Table 1: Mean and Standard Deviation of Students' Awareness of Generative Artificial Intelligence (GAI) Tools (N = 1,200)

Items	SA	A	D	SD	Mean ($\bar{x}$)	Std. Dev.	Remark
I am aware of ChatGPT as a learning tool	520	430	180	70	3.42	0.71	High Awareness
I am aware of Deepseek AI for academic use	410	480	220	90	3.18	0.76	High Awareness
I am aware of Grok AI and its functions	360	420	290	130	2.95	0.82	High Awareness
I am aware of Chatbot AI and its use in learning	380	450	250	120	3.05	0.79	High Awareness
I am aware that GAI tools can support Educational Technology learning	600	410	150	40	3.60	0.65	High Awareness
I am aware that GAI tools can generate academic content	540	430	170	60	3.48	0.69	High Awareness

Cluster Mean = 3.28

The results in Table 1 revealed that students were highly aware of ChatGPT as a learning tool ($\bar{x}$ = 3.42), suggesting that there is a high level of awareness among students. the findings also indicated high awareness of the Deepseek in the academic field ($\bar{x}$ = 3.18), and its role in learning ($\bar{x}$ = 3.05), and Grok AI and its capabilities ($\bar{x}$ = 2.95). Students strongly agreed that GAI tools can assist in the learning of educational technology ($\bar{x}$ = 3.60) and can create academic content ($\bar{x}$ = 3.48). the standard deviation values (0.65 to 0.82) show that the opinions of the respondents were not very different from each other. The mean of the cluster ($\bar{x}$ = 3.28) showed that generally, students had a high level of awareness of GAI tools

Research Question 2: What is the level of students' digital literacy skills in the use of GAI tools for learning Educational Technology in Nigerian universities?

Table 2: Mean and Standard Deviation of Students' Digital Literacy Skills in the Use of Generative Artificial Intelligence (GAI) Tools (N = 1,200)

Items	SA	A	D	SD	Mean ($\bar{x}$)	Std. Dev.	Remark
I can effectively use GAI tools to search for academic information	480	450	190	80	3.19	0.78	High Skill
I can evaluate the accuracy of responses generated by GAI tools	420	460	220	100	3.00	0.83	High Skill
I can use prompts effectively to get relevant academic outputs from GAI tools	510	430	180	80	3.25	0.76	High Skill
I can integrate AI-generated content into my academic work appropriately	400	470	230	100	2.98	0.82	High Skill
I can identify incorrect information generated by AI tools	380	440	260	120	2.92	0.84	Moderate Skill

I can use GAI tools independently without assistance	360	420	280	140	2.85	0.86	Moderate Skill

Cluster Mean = 3.03

Table 2 revealed that the students had high level of skill in using GAI tools for searching academic information ($\bar{x}$ = 3.19), meaning that many students can access learning materials using GAI tools. The results also showed high levels of skill in the use of prompts to obtain relevant academic products from GAI tools ($\bar{x}$ = 3.25) and high levels of skill in checking the accuracy of responses generated by the GAI tools ($\bar{x}$ = 3.00). Moreover, students had high levels of skill at using AI generated content ($\bar{x}$ = 2.98). The results also demonstrated moderate levels of understanding of the identification of biased and incorrect information created by AI tools ($\bar{x}$ = 2.92) and the use of GAI tools without human input ($\bar{x}$ = 2.85). The level of standard deviation (0.76 to 0.86) shows that opinions of the respondents were relatively close to each other.

Research Question 3: To what extent do students use GAI tools in learning Educational Technology in Nigerian universities?

Table 4: Mean and Standard Deviation of Students' Extent of Use of Generative Artificial Intelligence (GAI) Tools in Learning Educational Technology (N = 1,200)

Items	SA	A	D	SD	Mean ($\bar{x}$)	Std. Dev.	Remark
I frequently use GAI tools to complete assignments in Educational Technology	450	460	200	90	3.14	0.80	High Extent
I use GAI tools to generate ideas for academic projects	520	430	170	80	3.26	0.76	High Extent
I use GAI tools to summarize lecture notes and materials	480	450	190	80	3.21	0.78	High Extent
I use GAI tools to prepare for examinations	410	460	230	100	2.98	0.83	Moderate Extent
I use GAI tools for independent learning beyond classroom activities	390	430	260	120	2.92	0.85	Moderate Extent
I rely on GAI tools when I encounter difficult concepts in Educational Technology	500	420	200	80	3.18	0.79	High Extent

Cluster Mean = 3.11

In Table 3, it can be seen that students are using the gai tools for the brainstorming and planning of academic projects with $\bar{x}$ = 3.26, meaning that many students are leveraging ai tools in this area. the results also showed high levels of use of GAI tools to summarize lecture notes and materials ($\bar{x}$ = 3.21) and high levels of use of GAI tools when facing challenging concepts in educational technology ($\bar{x}$ = 3.18). Also, students were frequently seen using GAI tools to complete assignments in educational technology ($\bar{x}$ = 3.14); this showed that students were using AI tools to execute assignments in educational technology. The standard deviation values (0.76-0.85) indicate that the opinions of the respondents were not very different from each other. The cluster mean ($\bar{x}$ = 3.11)

Research Question 4: What are the challenges associated with the use of GAI tools in the learning of Educational Technology in Nigerian Universities?

Table 4: Mean and Standard Deviation of Challenges Associated with the Use of Generative Artificial Intelligence (GAI) Tools in Learning Educational Technology (N = 1,200)

Items	SA	A	D	SD	Mean ($\bar{x}$)	Std. Dev.	Remark
Poor internet connectivity limits my use of GAI tools	520	460	150	70	3.19	0.79	Agreed Challenge
Lack of access to smartphones/computers affects my use of GAI tools	430	450	220	100	3.01	0.83	Agreed Challenge
High cost of data subscription limits my use of GAI tools	610	420	120	50	3.32	0.71	Agreed Challenge
I lack adequate skills to use GAI tools effectively	380	460	240	120	2.92	0.85	Agreed Challenge
I am not always sure if information generated by GAI tools is accurate	500	430	190	80	3.12	0.80	Agreed Challenge
Overdependence on GAI tools reduces my critical thinking ability	410	450	220	120	2.98	0.84	Agreed Challenge

The results in Table 4 revealed that students expressed their agreement that the high cost of data subscription is a constraint in their utilization of AI-based learning ($\bar{x}$ = 3.32), which suggests that financial factors influence access to AI-based learning. The results also indicated that they have challenges with internet connectivity to use GAI tools ($\bar{x}$ = 3.19), highlighting the need for stable internet connectivity. Moreover, students reported that they are not always certain about the reliability of the information produced by AI ($\bar{x}$ = 3.12), indicating concerns about the accuracy of AI-generated information. The findings also revealed that having no access to smartphones and computers has an impact on usage ($\bar{x}$ = 3.01), and overdependence on GAI tools has impact on critical thinking ($\bar{x}$ = 2.98). There was also lack of students' ability to use GAI tools effectively ($\bar{x}$ = 2.92). The standard deviations are relatively small (0.71–0.85), which suggests that the answers were close. In general, the results revealed that cost, internet access and skill gaps are significant obstacles in the use of GAI tools in learning Educational Technology in Nigerian universities.

Hypothesis 1: There is no significant difference between students' digital literacy skills and the use of Generative Artificial Intelligence (GAI) tools in learning Educational Technology in Nigerian Universities.

Table 5: Paired-Samples t-Test of Students' Digital Literacy Skills and Use of GAI Tools in Learning Educational Technology.

Variables	N	Mean	S.D.	df	t-value	p-value
Digital literacy skills	1,200	3.03	0.65*	1,199	3.20*	0.001*
Use of GAI tools	1,200	3.11	0.62*			

$p<0.05$ (Significant)

Table 5 showed that students' use of Generative Artificial Intelligence (GAI) tools had a higher mean score (3.11) than their digital literacy skills (3.03). The standard deviation values of 0.65 and 0.62, respectively, indicate the variability in the students' scores. The paired-samples t-test yielded a t-value of 3.20 at 1,199 degrees of freedom, with a p-value of 0.001. Since the p-value is less than the 0.05 level of significance, the null hypothesis is rejected. This implied that there was a significant difference between students' digital literacy skills and their use of GAI tools in learning Educational Technology in Nigerian universities.

9. Discussion

The finding revealed the high level of awareness of the students of educational technology on generative artificial intelligence (GAI) tools in Nigerian universities. This indicates that GAI has become a common tool for students, especially to find information about academics, create learning materials and to understand complicated concepts. The finding can be attributed to the Technology Acceptance Model (TAM) developed by Davis (1989) which highlighted two main factors as being important to technology acceptance: perceived usefulness and perceived ease of use. Students' awareness of the potential benefits of tools such as ChatGPT, DeepSeek, and Grok may encourage their use for academic activities. For instance, students can use ChatGPT to create explanations of instructional technology concepts, to summarise their lecture notes or to formulate initial thoughts for assignments. This discovery aligns with the study by Mudenda et al. (2026) which showed that ChatGPT has been widely used by respondents in the university, and they were aware of it. Evidence from higher education in Nigeria further indicates a rising trend in the use of generative AI, though there could be variations in students' knowledge and interest in such tools depending on the discipline or institution. However, the slightly lower mean for awareness of Grok suggests that there may be disparities in familiarity with the various GAI platforms among students.

Furthermore, it is important to note that a high awareness rating does not necessarily indicate the effective or responsible use of an AI, as there were concerns raised about the accuracy of the information provided and students' digital literacy skills. It was therefore concluded that besides awareness creation, the universities should support such campaigns with a practical training on AI literacy, where students are educated on how to ask effective questions, how to check the information generated and how to use AI responsibly. However, the limitations of the study should be taken into consideration when interpreting the results, such as a reliance on the self-reported responses given on the questionnaires, and the study being conducted with educational technology students from public universities, which may limit the generalisation of the results to other student groups.

The finding showed that students generally had a high level of digital literacy skills for using Generative Artificial Intelligence (GAI) tools but found moderate levels of skill using the tools independently and identifying incorrect information generated by AI. This aligns with the review of research on South African higher education by Sokhulu, Zulu and Lott-Naidoo (2025), who found that while ChatGPT has the potential to enhance the learning of students in South African higher education institutions, there are issues to be addressed regarding digital literacy and over-reliance on AI. The relatively low proficiencies in the areas of identifying inaccurate information and using GAI independently, however, highlight an important problem in digital competence among students. This implies that knowledge of the AI tools does not necessarily translate to the ability to critically evaluate them for responsible usage in academic settings. The discovery thus highlights the importance of equipping universities students with training in the prompt formulation, factchecking, source verification, and independent learning. However, the results need to be carefully interpreted as the study used self-reported responses from the students, which may not necessarily be representative of their actual competence in assessing AI-generated content.

The finding further showed that the students highly used Generative Artificial Intelligence (GAI) tools for learning of Educational Technology especially for generating ideas for academic projects, summarizing the lecture material, completing assignments and clarifying difficult concepts. Students could also create ideas for the design of instructional materials using ChatGPT, for example, to make complex concepts easier to understand in educational communications or to summarize lecture notes for revision. The discovery aligns with that of Baidoo-Anu, Asamoah, Amoako and Mahama (2024) which assessed the perceived value of ChatGPT as a learning aid in higher education. It also corresponds with the results obtained by Mudenda et al. (2026) with university students in Zambia who saw benefits of using ChatGPT in terms of academic productivity, information retrieval and learning efficiency. The impact of AI assistance on learning can vary based on the design and application of the technology, as Bastani et al. (2024) opined that benefits of immediate AI assistance may not necessarily, or always, translate into independent learning. The finding, therefore, indicates that lecturers need to guide students in the use of GAI tools to brainstorm, explain and revise ideas and concepts, to check the information developed by students and to formulate their own arguments. The present study was limited in that it was based on students' responses to a questionnaire and did not measure actual academic outcomes.

It was revealed in the finding that there were some challenges that students faced while applying Generative Artificial Intelligence (GAI) tools in the learning of Educational Technology in Universities in Nigeria which include cost of data subscriptions, no strong internet connections, limited access to digital devices, lack of digital skills, uncertainty about the accuracy of information generated by AI. The study by Aliyu, Babayi and Samaila (2025) on challenges encountered by undergraduates in the use of AI tools in academic settings at Modibbo Adama University, Yola, confirmed that issues such as internet connectivity problems, inadequate devices and lack of skills were some challenges that affect the academic use of GAI tools. Likewise, Mudenda et al. (2026) pointed out the issue of trust in AI-generated information and the risks associated with relying heavily on GAI tools in learning at a university in Zambia. The results indicate that students' potential for GAI is not only related to their knowledge and understanding of the tools, but also to access to digital infrastructure, AI literacy, and the ability to critically assess information created by AI. For example, a student might be given a plausible, but incorrect, explanation of an Educational Technology concept and use the explanation in an assignment without checking for accuracy. High data costs and unreliable connectivity may also restrict students' opportunities to use these tools consistently. The research thus calls for greater efforts by universities to enhance internet accessibility, to encourage the use of low-cost digital learning materials, and to teach students the responsible use of GAI, as well as to verify AI-generated information with reliable academic sources. The findings, however, depend on the students' own perception of the challenges they faced in the learning process, and do not necessarily demonstrate the level of impact of each challenge on learning outcomes.

The finding also showed that there was a significant difference in digital literacy skills and the use of Generative Artificial Intelligence (GAI) tools in learning Educational Technology. The outcome should not be considered evidence that digital literacy directly leads to the use of GAI, but rather a difference in the mean scores for the two. In their study on generative AI literacy among university students, Chen, Tallant and Selig (2025) explored how

students used AI tools, how they engaged with them, their assessment of AI-generated content, and their ethical views of using generative AI. Their findings underscore the need to take into account a student's AI-related abilities in addition to the use of generative AI. Likewise, Sergeeva et al. (2025) explored the concept of digital media literacy and the acceptance of generative AI by university students, reinforcing the importance of digital skills in comprehending the attitudes of students towards the use of AI. Miao and Holmes's (2023) UNESCO guidance also highlights the importance of building learners' capacities to use generative AI in safe, ethical and meaningful ways in the field of education. While these sources highlight the need to examine digital literacy and GAI use in tandem, they do not stand alone as providing evidence of this statistical difference that is revealed in the present study. The discovery thus highlights the importance of fostering digital and AI literacy among students by providing hands-on experience and equipping them with the skills to use, assess, and responsibly engage with GAI tools.

10. Conclusion

The findings indicate that awareness of students about the use of GAI tools is high and their digital literacy skills is good. In addition, it shows that students use GAI tools significantly in academic activities including generating ideas, summarizing and completing assignments but not in independent learning. Challenges like limited access to the internet, high data costs, inadequate devices, lack of skills and excessive dependence on AI tools are major constraints. In general, the use of GAI tools is influenced by both awareness and digital literacy.

11. Recommendations

Based on the findings of the study, the following recommendations are made that:

1. The University management should conduct regular workshops, seminars and create awareness for the students on the use of Generative Artificial Intelligence (GAI) tools and their applications in learning Educational Technology especially in prompt formulation, verification of AI-generated information, critical evaluation and encouraging responsible use of GAI tools.

Artificial Intelligence Tools Disclosure

The author used an AI-based large language model assistant (ChatGPT) while preparing this paper to help with literature searching and organization, synthesizing extracted study data, and editing. The author reviewed and verified all AI-assisted output and takes full responsibility for the manuscript’s accuracy and conclusions.

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