

***Effect of EduGPT Artificial Intelligence on Academic Performance of Educational Technology Students: A Quasi -Experimental Study***

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**Abstract**

*This quasi-experimental study examined the effect of EduGPT Artificial Intelligence on the academic performance of 78 third-year educational technology students in Educational Resource Centre (ERC) course at the University of Calabar, Cross River State, Nigeria. The study aimed to determine the impact of EduGPT AI on retention and academic performance. The Educational Resource Centre Performance Test (ERCPT) was used for data collection, with reliability coefficient of 0.79. Data were analyzed using mean, standard deviation, and ANCOVA at 0.05 significant level. The results showed that EduGPT AI significantly enhanced retention and academic performance of both male and female students. The study demonstrates the potentials of EduGPT AI to support students' learning outcomes. The findings contribute to the existing body of knowledge on AI technology in education, providing insights into the effectiveness of EduGPT AI in improving academic performance in ERC courses. It is recommended that institutions should invest in infrastructure and resources to support the integration of EduGPT AI into teaching and learning process.*

**Keywords:** edugpt, AI, academic, performance, retention

## **Introduction**

The Educational Resource Centre (ERC) course is a pivotal component of the University of Calabar's curriculum specifically designed for third-year educational technology students. This course focuses on enhancing students' skills in developing, producing, utilizing and managing educational resources, thereby ensuring effective learning outcomes (Alileye, 2022). Mayasari and Shamila (2018) emphasize that Educational Resource Centre (ERC) course aims to equip students with information literacy skills, foster knowledge-based curriculum development, and promote resource-based learning in universities. By providing access to up-to-date resources, the ERC course encourages students to develop a positive attitude utilizing resource materials and taking ownership of the learning process. Educational Resource Centre (ERC) course is designed to equip students with the skills to develop and provide improvised learning materials, as well as organize workshops and seminars on the production and utilization of instructional media. Additionally, the course covers essential topics such as the storage and preservation of instructional media, design principles, and theories of instructional media development. Furthermore, it emphasizes the distribution of relevant instructional materials to schools in need, thereby enhancing the quality of education (Alileye, 2022).

Educational Resource Centre (ERC) course in universities is very significant. Educational Resource Centre (ERC) has different nomenclatures. It is called School Resource Centre (SRC), Teaching Resource Centre (TRC), Library and Nature Corner (LNC); it plays significant role in enhancing students' motivation, academic achievement and information literacy (Reyman & Romana, 2017). With the evolution of machine learning in education, the teaching of Educational Resource Centre (ERC) course would be easier, more resourceful and insightful in the universities.

Machine learning may be applied in teaching Educational Resource Centre (ERC) course to improve students' study process through personalized education, production of smart contents, task automation, self-tutoring and ensuring access to educational resources for students with special needs (Lisa, 2020). Machine learning, according to Michelle (2023), is ChatGPT AI, EduGPT AI, Midjourney AI and Canva's magic features. This artificial intelligence (AI) is not only to ensure that students are well equipped for their academic future but also for workforce development.

EduGPT AI, being one of the machine learning tools, equips lecturers with the knowledge and strategies they would need to use new technology to improve and streamline everyday processes as well as classroom implementations (Michelle, 2023). EduGPT AI helps students to have in depth knowledge of their course materials. Kandula (2020) stated that EduGPT AI is for data illustration, intelligent tutoring, tongue process and automated agents. These have powerful learning experiences for college and university students.

EduGPT AI needs human manipulation at the centre to transform the teaching learning process, especially with regards to courses in Educational Resource Centre in the universities. The lecturers need to design the instructional contents that direct the lessons for the students. UNESCO (2023) discussed that the promise for 'AI for all' must be that everyone can take advantage of technological revolution and access its fruits, notably, in terms of innovation and knowledge. Negin et al. (2023) posited that Artificial Intelligence (AI) such as EduGPT plays important role in learning by offering customized learning solutions tailored to each student's needs, comprehension, learning pace and academic goals. EduGPT AI can become effective tool for teaching and learning as well as performance. For instance, it can assist students in understanding and summarizing difficult texts and generate prompt for writing assignments (Tuba & Suheyla, 2023). Students should be allowed to use the access codes to log on to online instructional technologies (Google Meet Technology) frequently so that it would boost their confidence in using relevant technologies (Effiong et al., 2023).

EduGPT AI can make Educational Resource Centre (ERC) course planning fun because it gives lecturers detailed information about students including their learning styles, progress from past lesson and assessment data. This can help tailor lessons to individual needs (Stephanie, 2023). EduGPT AI can be used to investigate gender difference in the teaching and learning of Educational Resource Centre (ERC) courses in the university. Ofosu-Ampong (2023) asserted that participation of girls in Science, Technology, Engineering and Mathematics (STEM) subjects at the higher education (HE) level continues to lag behind that of boys and consequently may affect artificial intelligence, which Google EduGPT AI is one. Despite the surge in artificial intelligence (AI) based tools like EduGPT AI and ChatGPT AI, one obvious question is whether males and females in higher education are equally as likely to use AI tools for their learning and research (Ofosu-Ampong, 2023).

Salido (2023) carried out a study on the impact of AI-powered learning tools like EduGPT AI on students' understanding and academic performance. The study was aimed at evaluating the effect of artificial intelligence-driven educational resources such as

intelligent tutoring systems and virtual learning environment on the performance and comprehension of students. The finding suggested that artificial intelligence has the potential to bring about huge revolution in the field of education by making it possible to personalize and adjust students' educational experience in a way that boost both students' performance and their overall level of comprehension.

Ofosu-Ampong (2023) discussed that digital gap is the most prominent in the Global South, with one in five men utilizing the internet, which EduGPT AI is one of the internet accessible tools, compared to only one in seven women. For example, in Africa, women lag behind men by 25% in internet adoption; overall, women are 21% less likely than men to own a mobile device, the primary gateway to internet access in some developing countries (Ofosu-Ampong, 2023). According to Armah et al. (2020), males improved in academic performance than females in Mathematics classes during internet activities like EduGPT AI. This reported gender influence is however contradicted by Eyo (2022) who reported that gender has no significant influence on the extent of utilisation of Web 2.0 applications in counsellor education. Also contrary to the findings on differences based on gender, but using a different dependent variable, Omeje and Eyo (2008) reported that there was no gender difference between the academic achievements of male undergraduates with positive value system and their female counterparts with positive value system. Qi et al. (2022) posited that female students have shown to be more strongly influenced by the perception of computer self-efficacy, ease of use and playfulness whereas male students have been influenced by perceived usefulness.

Eyenekan et al. (2023) carried out a study on students' academic performance and retention in Physics using ICT-based teaching strategies. The study was conducted in Cross River State, Nigeria with quasi- experimental research design using non-randomized pretest and posttest group. The sample consisted 176 SS2 students drawn from four intact classes of four secondary schools within the study area. The reliability coefficient was 0.85 obtained for the study. Physics Achievement Test (PAT) was used for data collection. Mean and Analysis of Covariance (ANCOVA) was used in analyzing the data. The result of the finding showed that there was a significant difference in the academic performance and retention than those taught using power point presentation. Karahan (2024) explained that the advent of artificial intelligence (AI) like EduGPT in the educational sector has opened up new avenues for teaching and learning, fundamentally altering how knowledge is disseminated and retained. This advent has made retention easy to be measured during instructional process. Effiong (2020) opined that lecturers should be exposed on how to effectively use interactive whiteboard in

teaching educational technology courses by incorporating interactive whiteboard features such as animation, on-screen text, on-screen annotation, sound, video and diagrams that can secure interest and capture the attention and retention rates of learners.

### **Research questions**

The following research questions were posed to guide the study:

1. What is the difference in the academic performance of educational technology year 3 students in ERC course taught using EduGPT AI and those taught using expository method in the University of Calabar, Cross River State, Nigeria?
2. What is the difference in the academic performance of male and female educational technology years 3 students in ERC course taught using EduGPT AI in the University of Calabar, Cross River State, Nigeria?
3. What is the difference in the retention levels of educational technology year 3 students in ERC course taught using EduGPT AI and those taught using the expository method?

### **Hypotheses**

The following null hypotheses, tested at .05 levels of significance, were formulated to guide the study.

**Ho1:** There is no significant difference in academic performance of educational technology year 3 students in ERC course taught using EduGPT AI and those taught using expository method in the University of Calabar, Cross River State, Nigeria.

**Ho2:** There is no significant difference in academic performance of male and female educational technology year 3 students in ERC course taught using EduGPT AI in the University of Calabar, Cross River State, Nigeria.

**Ho3:** There is no significant difference in retention ability levels of educational technology year 3 students in ERC course taught using EduGPT AI and those taught using the expository method.

### **Methodology**

The study adopted quasi-experimental design using pretest and posttest non-randomized control group. This implies that the participants for the study do not have the same chance of being in the experimental or control group, receiving or not receiving treatment. The students were chosen in their intact class because the researchers aimed at comparing the students using pretest and posttest design. The population of the study comprised 98 educational technology year 3 students in Department of Educational Technology, University of Calabar in the 2023/2024 academic session. Purposive sampling technique was used to select 78 students for the study. The criteria for selection were that the

students belong to year 3 class, they have good and functional android phones, iphones or computer internet compliance devices that could access internet conveniently.

Educational Resource Centre Performance Test (ERCPT), which comprised 50 multiple-choice items, was used for data collection. The items were developed using standard specification of Blue Print with each item having 5 options lettered A-E. Each correct answer was scored 2 and the incorrect 0 giving a maximum of 100 marks. The performance test was administered to both experimental and control group. Educational Resource Centre Performance Test (ERCPT) was submitted for face and content validity to three senior lecturers in the Departments of Educational Technology, and Educational Foundations, all in the University of Calabar, Cross River State, Nigeria. To test for the reliability of Educational Resources Centre Performance Test (ERCPT) instrument, a trial test was conducted on twenty (20) year 3 students in Educational Technology Department who were not part of the main study but share the same characteristics with the sampled group. Split Half method was used for single administration to test for internal consistency of Educational Resource Centre Performance Test (ERCPT). The result was subjected to Spearman Brown Prophecy formula to produce a reliability coefficient of 0.79.

The instrument was develop using ASSURE model; the researchers started by analyzing and finally evaluating the students who were used for the lesson package. 78 year 3 students of Educational Technology (42 in experimental group and 36 in control group) were selected for the study. EduGPT from computer, iphone, ipad, or any smart phones were considered appropriate for the lesson package for the experimental group. A pretest was administered to the students (both experimental and control groups) before the commencement of the treatment. The researchers-made instructional package on Educational Resource Centre (ERC) was dropped on EduGPT AI for the experimental group while the note package on Educational Resource Centre was taught using expository method for the control group. The experiment lasted for one month.

After presenting the lesson for both the experimental and control groups on Educational Resource Centre (ERC) course, the experimental and control groups were tested one week after the lesson (posttest). The Educational Resource Centre Performance Test (ERCPT) answer scripts were retrieved by the researchers for collation and data analysis. Two weeks after the posttest, the ERCPT was reshuffled and administered on the subjects to measure retention. Mean and Standard Deviation was used to answer the research questions while Analysis of Covariance (ANCOVA) was used to test for the hypotheses at 0.05 level of significance.

## Presentation of results

**Research question 1:** What is the difference in the academic performance of year 3 educational technology students in Educational Resource Centre (ERC) course taught using EduGPT and those taught using expository method in the University of Calabar, Cross River State?

**Table 1:** Mean and Standard Deviation of ERC course taught using EduGPT and expository method.

Instructional Strategies	N	Pretest		Posttest		Mean difference
		mean	SD	mean	SD	
EduGPT	42	34.23	8.05	44.83	9.21	10.60
Expository Method	36	25.62	6.81	34.40	7.83	8.78

The result of the table 1 revealed that the mean score in academic performance of year 3 educational technology students in Educational Resource Centre (ERC) taught using EduGPT AI was 10.60 while that of students taught with the expository method was 8.78. This means that students taught with EduGPT AI performed better than students taught using expository method.

**Ho1:** There is no significant difference in the academic performance of educational technology year 3 students in ERC course taught using EduGPT AI and those taught using expository method in the University of Calabar, Cross River State, Nigeria.

**Table 2:** ANCOVA of ERC course taught using EduGPT AI and expository method

Sources	Type III Sum of squares	Df	Mean Square	Fcrit.	Fcal.	Sig.
Corrected model	3812.05a	2	1906.03	3.84	4.82	.00
Intercept	6002.97	1	6002.97		45.86	.00
Pretest	.29	1	.29		2.81	.53
Instructional Strategies	3102.80	75	3102.80		63.21	.00
Error	4146.03	78	55.28			
Total	289533.27	77				
Corrected Total	7503.85					

The results on table 2 revealed that the calculated F-value of 63.21 is greater than the critical F-value of 3.84 at 1 and 76 degrees of freedom and 0.05 level of significance. With this result, the null hypothesis was rejected. This implies that there is a significant difference in academic performance of educational technology year 3 students in Educational Resource Centre (ERC) taught using EduGPT and those taught using expository method in the University of Calabar, Cross River State.

**Research question 2:** What is the difference in the academic performance of male and female educational technology year 3 students in ERC course taught using EduGPT AI in the University of Calabar, Cross River State, Nigeria?

**Table 3:** Mean and standard deviation of male and female students ERC taught using EduGPT

Gender	N	Pretest mean	SD	Posttest mean	SD	Mean
Male	16	24.30	5.72	32.65	5.71	8.35
Female	26	23.72	4.21	32.07	5.04	8.35

The results of the table 3 revealed that the mean difference in academic performance of male and female educational technology year 3 students in Educational Resource Centre (ERC) course taught using EduGPT AI was 8.35 while that of the female counterparts was 8.35. This means that there is no difference in gender when educational technology year 3 students were taught with EduGPT AI in Educational Resource Centre (ERC) course in the University of Calabar.

**Ho2:** There is no significant difference in the academic performance of male and female educational technology year 3 students in ERC course taught using EduGPT AI in the University of Calabar, Cross River State, Nigeria.

**Table 4:** ANCOVA of male and female educational technology years 3 students in ERC course taught using EduGPT AI

Sources	Type III Sum of squares	Df	Mean Square	Fcrit.	Fcal.	Sig.
Corrected model	2418.73a	2	2418.73	3.84	1.23	.00
Intercept	6311.74	1	6311.74		34.14	.00
Pretest	24.67	1	24.67		1.50	.21



Gender	143.04	2	71.52	3.22	.00
Error	2387.10	75	31.83		
Total	124537.05	78			
Corrected Total	1328.6	77			

The result of table 4 revealed that the calculated F-value of 3.22 is less than the critical F-value of 3.84 at 1 and 76 degrees of freedom and 0.05 level of significance. With this result, the null hypothesis was retained. This implies that there is no significant difference in academic performance of male and female educational technology year 3 students in Educational Resource Centre (ERC) taught using EduGPT in the University of Calabar, Cross River State.

**Ho3:** There is no significant difference in the retention rates of educational technology year 3 students in Educational Resource Centre (ERC) course taught using EduGPT AI and those taught using the expository method.

**Table 5:** Result of ANCOVA analysis of difference in the retention rates of educational technology year 3 students in Educational Resource Centre (ERC) course taught using EduGPT AI and those taught using the expository method

Sources	Type Sum of squares	III Df of	Mean Square	Fcrit.	Fcal.	Sig.
Corrected model	2121.70a	2	1060.85	3.84	4.54	.00
Intercept	5764.61	1	5764.61		167.02	.00
Pretest	40.34	1	40.34		2.08	.21
Retention rates	2150.05	2	1075.02		33.34	.00
Error	3218.54	75	42.91			
Total	219043.74	78				
Corrected Total	7536.53	77				

The result of table 5 revealed that the calculated F-value of 33.34 is greater than the critical F-value of 3.84 at 1 and 76 degree of freedom and at 0.05 level of significance. With this result, the null hypothesis was rejected. This implies that there is a significant difference in the retention rates of educational technology year 3 students in Educational Resource Centre (ERC) course taught using EduGPT AI and those taught using the expository method.

### **Discussions of the findings**

The results from Ho1 revealed that there is a significant difference in academic performance of educational technology year 3 students in Educational Resource Centre (ERC) course taught with EduGPT AI and those taught using the expository method. The result may have been so because EduGPT used natural language to provide accurate responses to complex discussion on the Educational Resource Centre (ERC) course; this placed the students in experimental group on the advantage during the experiment. The result of the finding was supported by Negin et al. (2023) who posited that Artificial Intelligence (AI) such as EduGPT plays important role in learning by offering customized learning solutions tailored to each student's needs, comprehension, learning pace and academic goals. EduGPT AI can become effective tool for teaching and learning as well as performance. For instance, it can assist students in understanding and summarizing difficult texts and generate prompt for writing assignments (Tuba & Suheyla, 2023).

Findings from hypothesis II revealed that there is no significant difference between academic performance of male and female educational technology year 3 students in Educational Resource Centre (ERC) taught with EduGPT AI in the University of Calabar, Cross River State, Nigeria. This implies that gender does not significantly affect students' performance when students used EduGPT AI in learning Educational Resource Centre (ERC) course. This is because of the intuitive interface in EduGPT that made both male and female students to inquire for instructional explanations, which were responded to equally. It also made both the male and female students to tailor their experiences to their specific needs. The female students were equally competing with their male counterparts based on their abilities to acquire and use sophisticated android and iphones to gain smart responses to instructional lesson on Educational Resource Centre (ERC) course. The result of the finding was in line with Qi et al. (2022) who posited that female students have shown to be more strongly influenced by the perception of computer self-efficacy, ease of use and playfulness whereas male students have been influenced by perceived usefulness. This was also supported by Bryan (2022) who asserted that it is commonly assumed that gender gap would naturally fade as digital technologies become more universally accessible; the truth is that men and women interact with digital services like EduGPT AI, in similar ways.

The testing of the third hypothesis revealed that there is a significant difference in the retention rates of educational technology year 3 students in Educational Resource Centre (ERC) taught with EduGPT AI and those taught using the expository method in the University of Calabar, Cross River State. This is because EduGPT provide quick and

accurate answers that support retention. Students could access the instructional content repeatedly on the AI Chatbot in their android and iphone devices that guaranteed them additional advantage after their class lessons. This study was also supported by Effiong (2020) who opined that lecturers should be exposed to how to effectively use interactive whiteboard in teaching educational technology courses by incorporating interactive whiteboard features such as animation, on-screen text, on-screen annotation, sound, video and diagrams that can secure interest and capture the attention and retention rates of learners. The result of this finding was supported by Karahan (2024) who explained that the advent of artificial intelligence (AI) like EduGPT in the educational sector has opened up new avenues for teaching and learning, fundamentally altering how knowledge is disseminated and retained. This advent has made retention easy to be measured during instructional process.

### **Conclusion**

The study was conducted to examine the effect of EduGPT Artificial Intelligence on Academic Performance and retention of Educational Technology Students in the University of Calabar, Cross River State. It was concluded that EduGPT AI tools was significant to educational technology year 3 students learning of Educational Resource Centre (ERC) course especially when testing on gender and students' retention. EduGPT AI enhances the academic performance of students through prompt tutor assistance and elaboration of the design lesson package to the experimental group during the experimental session and directs the students on the in-depth knowledge of the instruction.

### **Recommendations**

1. Teachers should utilize EduGPT AI as a supplementary tool to develop skills in using AI-powered tools to support self-directed and collaborative work to enhance learning outcomes and improve academic performance as it has been found to improve academic performance of students taught with EduGPT AI as against their counterparts.
2. Teachers should design curricula and lessons that leverage AI-specific skills into educational technology curriculum as it was found not be gender biased.
3. EduGPT provides quick and accurate answers that support retention; institutions should invest in infrastructure and resources to support the integration of EduGPT AI into teaching and learning process.

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