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IMPACT OF ARTIFICIAL INTELLIGENCE POWERED CHATBOTS ON PROBLEM-SOLVING SKILLS AND SELF-ESTEEM OF SENIOR SECONDARY SCHOOL STUDENTS IN THE FEDERAL CAPITAL TERRITORY ABUJA, NIGERIA

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Keywords: *Artificial intelligence, AI Powered chatbots, Problem-solving skills, Self-esteem*

Abstract: *The study examined the impact of artificial intelligence powered chatbots on problem-solving skills and self-esteem of senior secondary school students in the Federal Capital Territory Abuja, Nigeria. Seven research questions and four hypotheses were formulated to guide the study. The research employed correlational survey design. The population comprised 66,390 students in Abuja. The sample was three hundred and eighty four (382) students. A self-design questionnaire was used for the study. The questionnaire was titled: Students' AI-Chatbots on Problem-solving Skills and Self-esteem Questionnaire (AIPSQ). The reliability coefficient index of 0.82 was obtained using test-retest. The data collected were analyzed using mean scores, standard deviation, t-test and Pearson Product Moment Correlation Coefficient (PPMCC). The findings showed that there is no significant relationship between AI Powered Chatbots usage and problem-solving skills of senior secondary school students in FCT, Abuja, Nigeria and there is no significant relationship between AI Powered Chatbots usage and self-esteem of senior secondary school students in FCT, Abuja, Nigeria. Based on their findings the study recommended that school authorities and social proprietors should provide conducive learning environment with necessary infrastructural facilities needed for effective AI Powered Chatbots instruction teaching since the method was found to be effective in boosting students' problem-skills and self-esteem in classroom learning.*

Introduction

Artificial Intelligence (AI) has become increasingly popular in the field of education as it offers immense potentials for improving teaching and learning. Teachers and students can possibly make use of diverse AI powered tools and systems which may include intelligent tutoring system, adaptive learning platforms, speech recognition tools, language translation tools amongst others to solve some of their daily educational related challenges, effortlessly. AI powered tools can also be utilized across various

domains of education such as personalized learning, immediate feedback, and educational content creation. By incorporating AI, teachers can personalize educational content and instruction to cater for the unique needs and preferences of each student (Ng et al., 2023). AI can serve as a bridge between students and educational resources; providing timely information on various subjects, academic results, and other educational enquiries. Some AI powered tools are designed in such way that could enhance students' comprehension, problem-solving skills and self-esteem and application of acquired knowledge in real-time. AI technology can give personalized support which could help students understand from complex to simple concepts and adapt learning materials according to individual needs. AI-powered educational tools provide personalised support and feedback to students, enhancing their emotional well-being by fostering understanding and support for their unique learning styles (Sanusi et al., 2023; Van Brummelen et al., 2021).

In an evolving and advancing field of technology, artificial intelligence (AI) has a transformative impact on education, to be precise our interaction with information and services (Chai et al., 2021). In an era where AI possesses cognitive capabilities, including learning, reasoning, and autonomous decision-making, understanding how students' form preferences for AI applications in solving diverse educational related problems has become increasingly crucial. A series of studies have pointed out that the integration of AI-Chatbots in Education has the potential to enhance teaching and learning experiences, improve educational outcomes, and support the diverse needs of students in today's digital age, where AI, with its ability to make autonomous decisions based on the programmed input, can contribute actively to our daily lives, which has become integral asset particularly in our education environment (Ng et al., 2023; Park & Kwon, 2023). It has become important to understand how individuals shape their preferences for AI applications especially AI powered tool such as AI-Chatbots. According to Lai et al., (2023), the integration of AI-ChatGPT and AI-Chatbot brings about a paradigm shift in educational tools, introducing a diverse array of transformative applications. Notably, this multifaceted incorporation of AI in education underscores its capacity to revolutionize traditional teaching methods and enhance the overall learning ecosystem (Lai, 2024). The use of ChatGPT in the field of education rapidly expands with growing curiosity and creation of tailored personalized learning environments for individual students which enables them to navigate and structure the course content in alignment with their specific academic tasks (Chiu et al., 2022).

AI which is be viewed as the simulation of human related intelligence, programmed in machine form, could perform different human related task with fluency. African Union (2024) described AI as 'computer systems that can simulate the processes of natural intelligence exhibited by humans where machines use technologies that enable them to learn and adapt, sense and interact, predict and recommend

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reason and plan, optimise procedures and parameters, operate autonomously, be creative and extract knowledge from large amounts of data to make decisions and recommendations for the purpose of achieving a set of objectives identified by humans'. AI-Chatbots which is an AI powered tool that is a subsidiary of AI-Chatbots which is a high level artificial intelligent tool with a multifunctional programme, designed to carry out diverse functions with the capability of natural language understanding in mimicking and simulating human related conversation and discussion with high accuracy and efficiency. AI-powered chatbots as a powered tool, has the potential to impact students' learning process and experiences in diverse ways. AI-Chatbots offers personalized and easy accessible supports; enabling students to seek clarifications, pose enquiries, and obtain guidance on academic related subjects. AI-powered Chatbots can help students navigate academic course selection, provide resources for mental health and wellness, and even offer career guidance and exploration tools (Aristanto et al., 2023). AI enhanced assistance can bolster students' self-confidence in their abilities, cultivating a perception of proficiency and an internal drive to confront obstacles. Moreover, the continuous availability of AI-powered chatbots guarantees that students can access academic assistance at any given time, accommodating their varied learning requirements and timetables.

The use of AI powered chatbots impacted on problem-solving skills has been explored in some scholarly studies. Diffang et al., (2024) highlighted that, with advancement in technology and educational technology, comes various modern 21st century technological mediums, gadgets and tools which is aiding in augmenting to make the teaching and learning process less cumbersome, more effective, individualized and learner centered, with the opportunity of selecting the most appropriate and suitable teaching and learning pedagogy to aid critical thinking and problem solving ability in the teaching and learning process in 21st century global educational setting. According to Ifelebuegu (2023), AI-Chatbots can be used to make online assessments more authentic and meaningful, thereby potentially enhancing problem-solving skills. Peng (2021) indicated that intelligent agents, including AI-ChatGPT, can assist in high-level thinking and problem-solving tasks. Gidado and Zubair (2025) shown that AI enables access to vast educational resources, promoting critical thinking, students' engagement and problem-solving skills in school.

Ahmad et al., (2023) found that the AI Chatbots can enhance problem-solving abilities, especially when integrated into educational systems. Also, buttress that the AI-Chatbots can enhance problem-solving abilities, especially when integrated into educational systems. This is relevant for understanding how ChatGPT often integral to robotics education, can impact problem-solving abilities (Bailey & Almusharaf, 2021). Students who feel supported by AI technology tend to have high problem-solving skills, self-confidence in overcoming academic tasks, positively impacting their performance (Yilmaz & Karaoglan, 2023).

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However, other studies have shown the risk that could involve in the overreliance on AI-Chatbots which could limit users' exploration of alternative problem-solving strategies (Chiu et al., 2022). Musi et al. (2023) revealed that critical thinking, a crucial skill involving the objective analysis and evaluation of an issue to form a judgment, can be significantly impacted by the use of AI-Chatbots. This effect can be both positive and negative, depending on various factors such as the design of the AI-Chatbots and the context of its use. Over-reliance on AI tools hinders the development of independent learning and critical thinking skills, as students might become too dependent on technology for answers. Excessive dependence on AI-Chatbots for decision-making or problem-solving might undermine an individual's confidence in his judgment and abilities, which may reduce his cognitive efforts to complete in academic tasks, resulting in poor memory, at the expense of active learning which is crucial for consolidation and retention (Cowan et al., 2021).

Studies have equally shown how AI powered AI-Chatbots could impact on students' self-esteem. Higher levels of engagement led to increased motivation and a sense of accomplishment boosting students' self-esteem and emotional resilience (Ericsson & Johansson, 2023). According to Kamdin (2023), AI-ChatGPT improve self-efficacy in experimental settings and have indirect effects on health-related self-efficacy. Arora et al., (2021) who found that self-control and self-efficacy were associated with using artificial intelligence to solve daily doubts, due to the need of interacting with someone and to do academic tasks instead of the student. Moreover, higher scores in self-esteem decreased the odds of using artificial intelligence due to the need of interacting with someone. Leavitt (2022) explores the impact of AI-ChatGPT tutors on confidence levels among students in an introductory programming course. The study finds that the effect of AI-ChatGPT tutor is stronger for women than for men, indicating a potential role in bridging the gender confidence gap in certain academic fields. In educational settings, AI-ChatGPT that provide personalized learning and positive feedback can enhance a student's sense of self-worth by acknowledging their progress and achievements. Ameen et al. (2022) revealed that AI-enabled AI-ChatGPT and social media affects body image, self-esteem, and purchase behavior among Generation Z women. The study found that these technologies, including AI-ChatGPT, positively affect body image and self-esteem. Moreover, AI-ChatGPT can help students feel more confident in their learning process by offering support and assistance, reducing feelings of frustration or helplessness when tackling challenging subjects. Kundu (2022) revealed that the use of AI has both positive and negative impacts on the psychological well-being of students. Increased engagement, cognitive achievement, self-efficacy, learning autonomy, and decreased frustration are among students.

AI-Chatbots can positively influence problem-solving skills and self-esteem among students' over-reliance in school. Zhang et al. (2022) AI-based educational AI-ChatGPT paradigm that aims to improve learners' emotional confidence

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and self-efficacy through dialogue templates and emotional connections. They further posited that AI-ChatGPT for social interaction or validation can lead to a reduction in real human connections, potentially negatively impacting self-esteem. Yilmaz and Karaoglan-Yilmaz (2023) AI-ChatGPT may lack the nuanced understanding of human emotions and complexities, leading to responses that can be perceived as insensitive or inappropriate, affecting an individual's self-esteem. Failure to receive adequate or empathetic responses from AI-ChatGPT during crucial conversations can lead to decreased self-confidence, especially in emotionally vulnerable individuals. Jiang and Zhao (2016) found that self-esteem prevented from using AI usage for interpersonal purposes and entertainment, whereas looking for information on the mobile phone positively correlated with self-control. However, there is a dearth of research exploring associations between self-control and the use of artificial intelligence tools. (Kircaburun, 2016) discovered that high self-esteem was not only related to less daily AI use time, but it also was a protective factor against AI addiction. Further revealed that self-esteem and AI use, it would be expected that the use of artificial intelligence tools is higher among individuals with low levels of self-esteem. Although numerous researches highlighted above pointed to a certain direction on the impact of AI powered AI-Chatbots on problem-solving skills and self-esteem among students in different part of the globe, little or no research work has so far been carried out on the very potentials of artificial intelligence powered AI-Chatbots on problem-solving skills and self-esteem of senior secondary school students' in FCT, Abuja, Nigeria.

Research Questions

1. To what extent do senior secondary school students in FCT, Abuja, Nigeria use AI Powered Chatbots for academic related activities?
2. What is the problem-solving skills of senior secondary school students in FCT, Abuja, Nigeria?
3. What is the self-esteem of senior secondary school students in FCT, Abuja, Nigeria?
4. What is the influence of AI Powered Chatbots usage on problem solving skills of senior secondary school students in FCT, Abuja, Nigeria?
5. What is the influence of AI Powered Chatbots usage on self-esteem of senior secondary school students in FCT, Abuja, Nigeria?
6. What is the influence of AI Powered Chatbots usage of male and female students of senior secondary schools in FCT, Abuja, Nigeria?
7. What is the influence of AI Powered Chatbots usage of urban and rural area students of senior secondary schools in FCT, Abuja, Nigeria?

Hypotheses

H_{o1}: There is no significant relationship between AI Powered Chatbots usage and problem-solving skills of senior secondary school students in FCT, Abuja, Nigeria.

H_{o2}: There is no significant relationship between AI Powered Chatbots usage and self-esteem of senior secondary school students in FCT, Abuja, Nigeria.

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H_{o3}: There is no significant difference in the AI Powered Chatbots usage of male and female students in senior secondary school students in FCT, Abuja, Nigeria.

H_{o4}: There is no significant difference in the AI Powered Chatbots usage of urban and rural area students in senior secondary school students in FCT, Abuja, Nigeria.

Statement of the Problem

The integration of technology into education especially artificial intelligence is evolving the dynamics of the teaching and learning process. AI powered technological tool such as AI-Chatbots with its rapid development especially within the educational community have had significant impact on education, since it can enhance the teaching and learning process to make it more efficient and engaging for both teacher and students. With AI-Chatbots which is a product of AI-Chatbots students can access educational related information speedily, learning could equally be enhanced to make it more engaging while students understanding and learning productivity could also be improve. AI-Chatbots usage has become a basic structure for students' in different levels of education in Nigeria including senior secondary school students since some of them use AI for their various academic related activities.

The increasing utilization of AI powered tool such as AI-Chatbots particularly among students for educational related purposes has raised concern on the impending impact it could have on problem-solving skills and self-esteem. It has been observed that educators are concern that excessive reliance on Artificial Intelligence powered tools such as AI-Chatbots could influence students' ability to think critically and solve problems especially complex academic related problems, independently. As they fear that if students become overly dependent on AI, it may influence critical thinking ability, problem-solving skills and self-esteem especially among senior secondary school students in the Federal Capital Territory. Similar concerns have been expressed by some of these students themselves. Expressing how excessive use of AI-Chatbots lower their motivation to solve problems independently and increase their potential for indolence especially when using AI-Chatbots rather than engaging in critical thinking skills which could enhance problem solving in their academics, or applying other problem solving method such as brain storming. Furthermore, the possible effects of AI powered Chatbots on students' self-esteem especially in terms of confidence, self-regulation and motivation needs further investigation.

It is on this premises that the researchers were inspired to investigate the Influence of Artificial Intelligence Powered Chatbots on problem-solving skills and self-esteem of senior secondary school students in the Federal Capital Territory Abuja, Nigeria.

Methods

Research Design

The study employed a correlational survey research design. Correlation survey design aimed at identifying predictive relationship among two or more variables. According to Cheprasov (2018), a correlation study is a type of research

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design where a researcher seeks to understand what kind of relations naturally occurring between two or more variables. The correlation survey design was appropriate for this study because it finds the relationship that exists between two or more variables that are related to one another.

Population of the Study

The population of this study constituted all 66,390 students in public senior secondary schools FCT, Abuja. The total number of public senior secondary schools is fifty-one (51) public senior secondary schools spread across the FCT, Abuja.

Sample Size and Sampling Procedure

The sample size for this study was 382 students FCT, Abuja. The sample size was determined using Krejcie and Morgan (1970) table. Also, proportionate sampling was used to determine the number of students who participated in Gwagwalada Area Council, Abuja.

Instrumentation

The research instrument for this study was self-structured questionnaire. The questionnaire was titled Students' AI-Chatbots on Problem-solving Skills and Self-esteem Questionnaire (AIPSQ). Responses to the items on the questionnaire was structured using four (4) point Likert scale of Very High Extent (VHE), High Extent (HE), Low Extent (LE) and Very Low Extent (VLE); and Strongly Agree (SA), Agree (A), Disagree (D) and Strongly Agree (SD).

Validity and Reliability of the Instrument

To ascertain the validity of the instrument the questionnaire was presented to experts in educational measurement and evaluation, and language expert for scrutiny to ensure that the instrument measure what it is supposed to measure. The comments and suggestions made were incorporated into the instrument after which a final copy of the questionnaire was produced.

The reliability of the instruments was determined by conducting a pilot study with 50 respondents in two schools but outside the main study area. A test-retest method was employed to determine the reliability coefficient. Test-retest method of reliability is a statistical measurement administering the same test twice over a period of time to a group of individuals. The first test was administered to the students, two weeks later the same test was administered to the same students. Students' responses were collated after which data collected was subjected to Pearson Product Moment Correlation Coefficient (PPMCC) which yielded reliability index of 0.82.

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Results

Research Question One: To what extent do senior secondary school students in FCT, Abuja, Nigeria use AI Powered Chatbots for academic related activities?

Table 1: Extent of AI Powered Chatbots Usage of Senior Secondary School Students

S/No.	Statement	Mean	Std Dev.	Decision
1	I regularly use powered Chatbots for my class activities	2.86	0.83	High Extent
2	AI enable students to complete classwork more efficiently and saving time	3.11	0.36	High Extent
3	I do not use Chatbots to make further research for school assignment	3.64	0.62	High Extent
4	I learn the skills that enable effective use of Chatbots application	3.48	0.74	High Extent
5	I am better than most of my peers in effectively using Chatbots application	2.53	1.08	High Extent
6	I personnally use Chatbots to surpasses my peer group in classroom learning	3.31	0.91	High Extent
7	The usage of Chatbots serves as potential learning resources for students	3.00	0.87	High Extent
8	The use of Chatbots prepare students ahead of class lesson	2.51	1.09	High Extent
9	Regular use of Chatbots encourage students in examination malpractices	3.40	0.95	High Extent
10	Regular usage of Chatbots enhance students self-reliant in examination	2.26	0.93	Low Extent
11	The using Chatbots keep me informed on what is happening in my immediate environment	2.32	1.02	Low Extent
12	The regular use of Chatbots deepens students understanding in classroom learning	2.51	0.90	High Extent
13	The usage of Chatbots reduce students ability of retaining information	2.02	0.58	Low Extent
14	Chatbots sometimes disrupt students learning process	3.44	0.66	High Extent
15	The usage of Chatbots increases learning and research capacity	3.35	0.83	High Extent
16	The regular use of Chatbots distract students from learning	2.40	0.62	Low Extent
17	Frequent use of Chatbots discourage extra moral class learning among students	3.17	0.67	High Extent
18		3.31	0.82	High Extent

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19	Chatbots enhances overall efficiency and making education simpler and interesting	2.77	0.42	High Extent
20	Students who are exposed to Chatbots perform better compare to those who are not	2.20	0.60	Low Extent
	Students excel in classroom when taught with Chatbots	**2.87**	**0.74**	**High Extent**
	Grand Mean/Std. Dev.			

As shown in table 1, extent of AI powered Chatbots usage of senior secondary school students in the FCT, Abuja, Nigeria was presented. The table show a grand mean of 2.87, this shows that there is high extent of AI powered Chatbots student's usage in the study area. Fifteen (15) items revealed high extent while five (5) items recorded low extent. This further indicates that students widely use AI powered Chatbots for learning, as it enhanced their overall efficiency and making education simpler and interesting.

Research Question Two: What is the problem-solving skills of senior secondary school students in FCT, Abuja, Nigeria?

Table 2: Problem-solving Skills of Senior Secondary School Students

S/No.	Statement	Mean	Std Dev.	Decision
1	I am able to apply skills learned	3.33	0.43	Agree
2	Able to be critical and reflective in thinking	3.60	0.57	Agree
3	I am willing to make extra effort on classwork activities	2.48	0.82	Disagree
4	I always develop skills in real-life problems	2.64	0.69	Agree
5	I believe that if I make enough effort, I will solve any problem	3.30	0.77	Agree
6	I have challenges in solving problems skills during classroom learning	3.07	0.75	Agree
7	No matter how hard I try to solve problem I can't reach a solution	3.14	0.63	Agree
8	I can't produce any solutions for problem	2.31	0.44	Disagree
9	I have no confidence in solving any problem in class	2.43	0.58	Disagree
10	I normally solve problems quickly without wasting time	3.23	0.75	Agree
11	I am a quick learner, but find it difficult to solve real life problem	2.19	1.28	Disagree
12	I tend to focus on immediate problems and let others worry about the future	2.59	0.36	Agree
13	Before I put an energy on a task, I like to know what it entails	3.24	0.76	Agree
14	I don't let discourage me, no matter how difficult the task is	2.71	0.67	Agree
15	When faced with difficult task, I prefer to solve it myself rather than waiting for advice of others	3.00	0.13	Agree
16		2.50	0.68	Agree

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17	I would rather struggle through a personal problem myself rather than discuss it with friends	2.59	0.24	Agree
18	I do not like to depend on other people for help in solving my problems.	3.24	0.46	Agree
	I like doing things on own and receive occasional praise myself	2.51	0.71	Agree
19	My friends always believe that I am a complex and intellectual person.	**2.84**	**0.61**	**Agree**
	Grand Mean/Std. Dev.			

As shown in table 2, problem-solving skills of senior secondary school students in FCT, Abuja, Nigeria was presented. The table show a grand mean of 2.84, this suggests that students exhibit problem-solving skills in schools. Fifteen (15) items revealed agreement while four (4) items recorded disagreement. This shows that students widely displaced confidence in problem-solving skills during classroom learning.

Research Question Three: What is the self-esteem of senior secondary school students in FCT, Abuja, Nigeria?

Table 3: Self-esteem of Senior Secondary School Students

S/No.	Statement	Mean	Std Dev.	Decision
1	I believe I am an excellence student	2.66	0.95	Agree
2	I don't feel shy in the class	3.31	0.60	Agree
3	I like expressing myself during classroom learning	2.38	0.82	Disagree
4	I feel that I have a number of good qualities interaction	2.30	0.27	Disagree
5	I am satisfied with performance	2.84	0.71	Agree
6	I set targets to achieve my goals and I make sure I achieve them by all means	3.14	0.93	Agree
7	I strive to test my abilities and go beyond my comfort zone	3.00	0.44	Agree
8	I believe others perceived me as a difficult	2.73	0.58	Agree
9	I sincerely believe in myself	2.54	0.75	Agree
10	At times I think I am not good at all	2.38	1.28	Disagree
11	I certainly feel useless at times	2.02	0.36	Disagree
12	I take a positive attitude towards myself	3.24	0.73	Agree
13	I feel that I do not have much to be proud of as a student	2.11	0.67	Disagree
14	Sometimes, I am inclined to feel that I am a failure	1.89	1.03	Disagree
15	My self-worth has assisted me to shun laziness in school	2.76	0.62	Agree
	Grand Mean/Std. Dev.	**2.62**	**0.71**	**Agree**

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As shown in table 3, self-esteem of senior secondary school students in FCT, Abuja, Nigeria was presented. The table show a grand mean of 2.62. This shows the agreement and disagreement of some items. Nine (9) items revealed agreement while six (6) items recorded disagreement. The result indicated that students set targets to achieve their academic goals and there is moderate self-esteem among senior secondary schools in Federal Capital Territory, Abuja

Testing Hypotheses

H_{o1}: There is no significant relationship between AI Powered Chatbots usage and problem-solving skills of senior secondary school students in FCT, Abuja, Nigeria.

Table 4: Correlational Test between AI Powered Chatbots usage and Problem-solving skills

Variables	N	$\bar{X}$	SD	r-cal	p-value	Decision
Chatbots Usage and Problem-solving Skills	382	3.17	0.72	.846	.000	Rejected

As shown in table 4, a correlational test between test anxiety level and academic achievement was carried out. The table revealed that mean of 3.17, standard deviation of .72 and an r value of .846. The table also indicates the p-value of .000 with $p < 0.05$. This implies that the null hypothesis was rejected. Therefore, there is significant relationship between AI Powered Chatbots usage and problem-solving skills of senior secondary school students in FCT, Abuja, Nigeria.

H_{o2}: There is no significant relationship between AI Powered Chatbots usage and self-esteem of senior secondary school students in FCT, Abuja, Nigeria.

Table 5: Correlational Test between AI Powered Chatbots Usage and Self-Esteem

Variables	N	$\bar{X}$	SD	r-cal	p-value	Decision
Chatbots Usage and Self-Esteem	382	2.87	0.58	.903	.000	Accepted

As shown in table 5, a correlational test between test anxiety level and academic achievement was carried out. The table revealed that mean of 2.87, standard deviation of 0.58 and an r value of .903. The table also indicates the p-value of .000 with $p < 0.05$. This implies that the null hypothesis was rejected. Therefore, there is significant relationship between AI Powered Chatbots usage and self-esteem of senior secondary school students in FCT, Abuja, Nigeria.

H_{o3}: There is no significant difference in the AI Powered Chatbots usage of male and female students in senior secondary school in FCT, Abuja, Nigeria.

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Table 6: t-test Analysis on Difference in the AI Powered Chatbots usage of male and female students

Gender	N	Mean	SD	t-value	df	Sig(2-tailed)	Decision
Male	258	3.76	0.33	0.48	380	103	Accepted
Female	124	2.19	0.08				

As shown in table 6, a t-test analysis on difference AI Powered Chatbots usage of male and female students was carried out. The table revealed a mean score of 3.76 with standard deviation of 0.33 for male students, while a mean score of 2.19 with standard deviation of 0.08 was obtained for female students. The table further indicates a calculated t-value of 0.48 at 380 degree of freedom with the t-value of 103 ($p > 0.05$). Therefore, the null hypothesis was accepted. This implies that there is no significant difference in the AI Powered Chatbots usage of male and female students in senior secondary schools in FCT, Abuja, Nigeria.

H_{04}: There is no significant difference in the AI Powered Chatbots usage of urban and rural area students in senior secondary schools in FCT, Abuja, Nigeria.

Table 7: t-test Analysis on Difference in the AI Powered Chatbots usage of Urban and Rural Area Students

Location	N	Mean	SD	t-value	df	Sig(2-tailed)	Decision
Urban	214	3.15	0.91	0.71	380	.000	Rejected
Rural	168	3.00	0.54				

As shown in table 7, a t-test analysis on difference in the AI Powered Chatbots usage of urban and rural area students was presented. The table revealed a mean score of 2.73 with standard deviation of 0.33 for male students, while a mean score of 2.59 with standard deviation of 0.08 was obtained for female students. The table further indicates a calculated t-value of 0.224 at 382 degree of freedom with the t-value of 000 ($p < 0.05$). Therefore, the null hypothesis was rejected. This implies that there is significant difference in the AI Powered Chatbots usage of urban and rural area students in senior secondary school in FCT, Abuja, Nigeria.

Discussion of Findings

The study revealed that there is significant relationship between AI Powered Chatbots usage on problem-solving skills of senior secondary school students in FCT, Abuja, Nigeria. The finding is in agreement with Gidado and Zubair (2025) revealed that AI-ChatGPT has significantly influence on students' productivity and learning efficiency, especially in increasing their level of problem-solving skill. Also buttress that ChatGPT assists students in tackling various challenges and speed up their learning process. This finding support the finding of Hua et al., (2024) who found that

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ChatGPT assist students to develop creative ideas, discover new approaches writing and solving
Assignment. AI revolutionized language learning by providing engaging, personalized experience
experiences tailored individual abilities and preferences. However, ChatGPT not only facilitates
students' understanding of lesson material but also helps them develop broader problem-solving
skills and adaptive skills.

There is significant relationship between AI Powered Chatbots usage on self-esteem of senior secondary school students in FCT, Abuja, Nigeria. The finding contradicts the earlier findings by Elbanna and Armstrong (2024) result shows that there is no significant relationship between AI-Chatbots usage on self-esteem of senior secondary school students in FCT, Abuja, Nigeria. The regular of use of AI-Chatbots during and after lesson increase the level of students' self-esteem in school. The finding further echoed Gidado and Zubair, (2025) whose indicates that AI-ChatGPT improve students effectiveness during classroom learning as such help them to develop creative ideas and discover new approaches solving assignment and attempting examination questions. This is also echoed by Gidado et al., (2025) and Gidado (2000), who in separate research efforts revealed that the psychological environment of a school has a significant effect on the individual self-esteem and achievement with $p > 0.05$. As they pointed the need for a good healthy school environment as a major influencer of students' self-esteem and eventual to stronger sense of self-worth, problem-solving skill and creative mind life in their abilities in the school. The finding is consistent with the finding of Maina et al., (2021) revealed that there significant relationship between AI-Chatbots usage and student's self-esteem level of secondary school students in Gashua Education zone, Yobe State.

On the basis of gender, there is no significant difference in the AI Powered Chatbots usage of male and female students in senior secondary school students in FCT, Abuja, Nigeria. The finding is contradicts with the earlier finding by Alexopoulos (2024) discovered that there is significant difference in AI-ChatGPT usage of male and female students. The finding further indicates that high AI-ChatGPT usage influence male and female students as a result of learning environment. The finding is in agreement with the finding of Bibi and Atta (2024) who found that there is no significant difference in Chatbots usage between male and female students in school. The result shows that the female participants had high self-esteem as compared to their male counterparts. However, gender differences were found to be insignificant in terms of academic performance.

There is significance difference in the AI Powered Chatbot usage of urban and rural area students in senior secondary school in FCT, Abuja, Nigeria. This finding is consistent with the finding of Adeshola and Adepoju (2023) shows that the use of ChatGPT as a tool for academic support, increases students' motivation to learn. This is helpful tools, immediate feedback, and

engaging features that encourage students' interest and participation in their academic endeavors regardless of their location. The finding is in variance with Bucea-Manea-Tonis et al., (2022) who revealed that there is no significant difference in the AI-Chatbots usage of urban and rural area students, with and r value of 0.441 ($p > 0.05$). AI-Chatbots contribute to promoting learning, curiosity, and innovative and critical thinking in students in their study location.

Conclusion

In conclusion, the use of AI Powered ChatGPT by school students brings numerous benefits and potentials, as technology continues to shape the educational landscape, teachers, parents, and policymakers need to recognise and address these challenges proactively. By fostering a supportive AI environment that promotes problem-solving skills, critical thinking skills, self-esteem and digital literacy and to empower students to engage with AI responsibly and ethically, also help ensuring that they are prepared to harness the benefits of technology while learning.

Recommendations

The following recommendations were made from the findings of the research.

1. Ministry of Education, school authorities and social proprietors should provide conducive learning environment with necessary infrastructural facilities needed for effective AI Powered Chatbots instruction teaching since the method was found to be effective in boosting students' problem-skills and self-esteem in classroom learning.
2. Government and Non-Governmental Agencies should create regular workshop, seminar, symposium for students to encourage AI Powered Chatbots effective use in order to increase their level of self-esteem and creative skills.
3. Government should recognize the influence of AI Powered Chatbots usage to facilitate their teaching and allowing students irrespective of their gender to actively involved in group discussions. This student-centered approach that will promotes the construction of their own knowledge, leading to high self-esteem and creative skills.
4. AI Powered Chatbots should be emphasized and incorporated into education curriculum in secondary school regardless of their school location. The essence is to make the teaching approaches easier to teachers during teaching.

REFERENCES

Adeshola, I., & Adepoju, A. P. (2023). The opportunities and challenges of ChatGPT in education. *Interactive Learning Environments*, 1–14. https://doi.org/10.1080/10494820.2023.2253858

African Union (AU). (2024). *Continental artificial intelligence strategy: Harnessing AI for Africa's development and prosperity*. African Union. https://au.int/sites/default/files/docum

ents/44004-doc-EN-Continental_AI_Strategy_July_2024.pdf

Ahmad, S. F., Han, H., Alam, M. M., Rehmat, M., Irshad, M., Arraño-Muñoz, M., & Ariza-Montes, A. (2023). Impact of artificial intelligence on human loss in decision making, laziness and safety in education. *Humanities and Social Sciences Communications, 10*(1), 1–14. https://doi.org/10.1057/s41599-023-01787-8

Alexopoulos, P. (2024). Higher education students' views on the use of artificial intelligence for teaching students with specific learning disabilities. *European Journal of Open Education and E-learning Studies, 9*(1). https://doi.org/10.46827/ejoe.v9i1.5518

Bibi, Z., & Atta, A. (2024). The role of ChatGPT as AI English writing assistant: A study of students' perceptions, experiences, and satisfaction. *Annals of Human and Social Sciences, 5*(1), 433–443. https://doi.org/10.35484/ahss.2024(5-I)39

Bucea-Manea-Ţoniş, R., Kuleto, V., Gudei, S. C. D., Lianu, C., Lianu, C., Ilić, M. P., & Păun, D. (2022). Artificial intelligence potential in higher education institutions enhanced learning environment in Romania and Serbia. *Sustainability, 14*(10), 5842. https://doi.org/10.3390/su14105842

Chiu, T. K. F., Meng, H., Chai, C. S., King, I., Wong, S., & Yam, Y. (2022). Creation and evaluation of a pretertiary Artificial Intelligence (AI) curriculum. *IEEE Transactions on Education, 65*(1), 30–39. https://doi.org/10.1109/te.2021.3085878

Cowan, E. T., Schapiro, A. C., Dunsmoor, J. E., & Murty, V. P. (2021). Memory consolidation as an adaptive process. *Psychonomic Bulletin & Review, 28*(6), 1796–1810. https://doi.org/10.3758/s13423-021-01978-x

Diffang, A. D., Mansur, S., & Mohammed, H. M. (2024). Information and communication technology: A panacea for addressing teaching and learning pedagogy among teachers using fifth generation technology in 21st century Nigeria. *International Journal of Social Sciences and Management Research, 10*(8), 386–394. https://doi.org/10.56201/ijssmr.v10.no8.2024.pg386.394

Elbanna, S., & Armstrong, L. (2024). Exploring the integration of ChatGPT in education: Adapting for the future. *Management & Sustainability: An Arab Review, 3*(1), 16–29. https://doi.org/10.1108/MSAR-03-2023-0016

Ericsson, E., & Johansson, S. (2023). English speaking practice with conversational AI: Lower secondary students' educational

experiences over time. *Computers and Education: Artificial Intelligence, 5*, 100164. https://doi.org/10.1016/j.caeai.2023.100164

Gidado, B. K. (2000). Environmental factors and student's poor academic performance in Bauchi State secondary schools. *Abuja Journal of Education, 3*(1), 5–15.

Gidado, B. K., Apeh, H. A., & Akinjobi, F. N. (2025). Relationship between self-esteem and academic achievement of senior secondary school students in North-Central, Nigeria. *Asian Journal of Education and Social Studies, 51*(2), 99–110. https://doi.org/10.9734/ajess/2025/v51i21770

Gidado, B. K., & Zubair, T. H. (2025). Effect of artificial intelligence (AI-ChatGPT) on educational psychology students' engagement, interest and achievement in the Institute of Education, University of Abuja, Abuja, Nigeria. *Asian Journal of Advanced Research and Reports, 19*(3), 80–92. https://doi.org/10.9734/ajarr/2025/v19i3923

Hua, S., Jin, S., & Jiang, S. (2024). The limitations and ethical considerations of ChatGPT. *Data Intelligence, 6*(1), 201–239. https://doi.org/10.1162/dint_a_00243

Sanusi, I. T., Oyelere, S. S., Vartiainen, H., Suhonen, J., & Tukiainen, M. (2023). Developing middle school students' understanding of machine learning in an African school. *Computers and Education: Artificial Intelligence, 5*, 100155. https://doi.org/10.1016/j.caeai.2023.100155

Van Brummelen, J., Tabunshchyk, V., & Heng, T. (2021). "Alexa, can I program you?": Student perceptions of conversational artificial intelligence before and after programming Alexa. In M. Roussou, S. Shahid, J. A. Fails, & M. Landoni (Eds.), *Proceedings of the 20th Annual ACM Interaction Design and Children Conference* (pp. 305–313). ACM. https://doi.org/10.1145/3459990.3460730

Williams, R., Park, H. W., Oh, L., & Breazeal, C. (2019). PopBots: Designing an artificial intelligence curriculum for early childhood education. *Proceedings of the AAAI Conference on Artificial Intelligence, 33*(1), 9729–9736. https://doi.org/10.1609/aaai.v33i01.33019729

Yilmaz, R., & Karaoglan, F. G. (2023). The effect of generative artificial intelligence (AI)-based tool use on students' computational thinking skills, programming self-efficacy and motivation. *Computers and Education: Artificial Intelligence, 4*,

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