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Artificial Intelligence and Curriculum Delivery: A Study of Teaching Approaches in Civic and Social Studies Education in Secondary Schools in Calabar Municipality of Cross River State, Nigeria

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Abstract
This research study focused on how AI was utilized in curriculum practices and teaching didactics in secondary schools in Calabar Municipality in Cross River State. The research particularly focused on the extent of AI incorporation, how AI has affected teaching, how teachers perceive AI, and the link between the use of AI and student-centred pedagogy. It was a descriptive survey of 55 Civic and Social Studies teachers in public secondary schools. Data was collected by using structured questionnaire and analyzed with mean, standard deviation, Pearson Product Moment correlation and independent t-test. The results revealed that there were significant correlations between AI use and effectiveness of curriculum delivery as well as the use of student-centred approaches. It was recommended, among others, that teacher training, infrastructural development, curriculum reform, and policy support should be provided to promote equitable adoption of AI.
Keywords: artificial intelligence, curriculum delivery, civic education, social studies, teaching approaches

Introduction

The 21st century has seen a tremendous evolutionary change in the education sector whereby digital technologies have made a massive difference including but not limited to Artificial Intelligence (AI). Artificial intelligence is transforming the way curriculum is delivered, especially, the manner in which teachers design learning plans and engage with students, and measure the results in education (Zawacki-Richter et al., 2019). The

application of AI in the context of Civic and Social Studies education, which are indispensable subjects in the development of the requirements of both citizenship and social responsibility, has a major potential to increase interactivity, individualization of the educational process, and the development of a critical approach in a learner (Luckin et al., 2022). Obi and Odu (2021) found that teachers who integrated AI applications in Social Studies were more likely to implement project-based learning, peer collaboration, and formative assessments that foster critical thinking and learner autonomy.

The concept of Artificial Intelligence (AI) can be characterized in the form of computer systems that have been developed to accomplish the actions that are normally associated with human intelligence, including learning, problem-solving, decision-making, and natural language processing functions (Luckin et al., 2022). Some of the AI applications in education are intelligent tutoring systems, automated grading, personalized learning algorithms, predictive analytics, and virtual learning assistants (Zawacki-Richter et al., 2019). These instruments can be configured to present content, monitor learning development, give immediate feedback, and contribute to differentiated instruction; therefore, in order to make education more competent by the end of this century, the use of AI cannot be avoided. According to Okoye and Ede (2022), digital platforms such as intelligent tutoring systems and AI-generated learning content can enhance the pace, quality, and relevance of curriculum delivery in secondary education. Aderibigbe and Adamu (2021) found that professional development workshops significantly improved teachers' perception and willingness to adopt educational technologies, including AI applications. Also, Oluwabunmi and Ayeni (2022) concluded that trained teachers were more likely to explore the full potentials of AI for lesson planning, real-time student feedback, and differentiated instruction in Social Studies.

Artificial intelligence has been one of the most disruptive technologies in global education with services like intelligent tutoring systems, machine learning algorithms, raised feedback systems and predictive analytics to aid in the implementation of the curriculum (Chen et al., 2020). In developed nations, the field of AI has grown in use to individualize teaching and aid data driven choices in classrooms (Holmes et al., 2021). But in some developing countries such as Nigeria, the implementation of AI in education remains at an early phase and can often be limited by factors such as infrastructural shortcomings, low digital literacy levels, and policy lapses (Aina & Bello, 2023). Chukwuma and Ikwuagwu (2023) found that AI-powered lesson planning and content generation assist teachers in addressing curriculum targets more efficiently and adapting instruction to learners' needs. Teachers

using AI tools may have access to more diverse and tailored learning resources, real-time feedback systems, and automated assessment mechanisms, all of which streamline lesson execution and promote learner engagement.

Although the use of Artificial Intelligence has a transformative effect on the education sector, little empirical knowledge of its usage in teaching Civic and Social Studies in secondary schools in Calabar Municipality exists. Although it has been shown that globally, the application of AI has had positive results relating to individualized learning, engagement by students and efficiency in the delivery of instructions (Zawacki-Richter et al., 2019; Holmes et al., 2021), there are no evidence that these gains are being achieved in the Nigerian context as well.

In addition, most methods of teaching these subjects are still engrained in traditional pedagogies where learning is not entirely participatory with students except in critical reflections. Such an incompatibility of technological possibilities and pedagogical practice poses questions related to the preparedness of schools, teaching staff, and policymakers to take advantage of AI to improve the curriculum (Okonkwo & Chukwuemeka, 2023). In the absent of adequate empirical data on the application or the non-application of AI in the teaching of Civic and Social Studies, the educational stakeholders may have little or no data to inform future training, investments, and even development of policies. Therefore, this study addressed this gap by examining the role of AI in curriculum delivery and the teaching approaches employed in Civic and Social Studies education in secondary schools within Calabar Municipality.

Objectives of the study

The general objective of this study is to investigate the role of Artificial Intelligence (AI) in curriculum delivery and the teaching approaches employed in Civic and Social Studies education in secondary schools in Calabar Municipality. The specific objectives are to:

1. Examine the relationship between the use of AI tools and the extent of curriculum delivery in Civic and Social Studies Education in secondary schools.
2. Determine the relationship between the use of AI and the adoption of student-centred teaching approaches in Civic and Social Studies Education.
3. Examine the significant difference in perceived effectiveness of AI-driven instruction on student engagement between AI-using and non-AI-using teachers.

Hypotheses

The following null hypotheses guided the study:

Ho1: There is no significant relationship between the use of AI tools and the extent of curriculum delivery in Civic and Social Studies in secondary schools.

Ho2: There is no significant relationship between the use of AI and the adoption of student-centred teaching approaches in Civic and Social Studies.

Ho3: There is no significant difference in perceived effectiveness of AI-driven instruction on student engagement between AI-using and non-AI-using teachers.

Methodology

In this research, a descriptive survey research design was used. The design suits collecting extensive data regarding the application of this Artificial Intelligence (AI) in the curriculum delivery and teaching strategies of teachers on Civic and Social Studies education with the help of a representative sample of teachers. Due to the survey design, it is possible to systematically collect both quantitative and qualitative data without any interference in the study variables (Nworgu, 2015). The population was all Social Studies and Civic Education teachers in the public secondary schools in Calabar Municipality. The Cross River State Secondary Education Board (2024) reveals a figure of 65 Civic and Social Studies teachers in 20 public secondary schools in the study area. The purposive sampling technique was adopted to sample 55 teachers, since not all teachers were available as at the time of the administration of the questionnaire.

The primary instrument for data collection is a structured questionnaire titled: "Artificial Intelligence and Curriculum Delivery Questionnaire (AICDQ)". The instrument consists of four sections: Section A: Demographic Information, Section B: Extent of AI Integration in Civic and Social Studies, Section C: Teaching Approaches Influenced by AI, Section D: Perceived Effectiveness of AI on Student Engagement and Learning. The questionnaire used a 4-point Likert-type scale (Strongly Agree-4 points, Agree-3 points, Disagree-2 points, Strongly Disagree-1 point, and vice versa for negatively worded items).

To ensure face and content validity, the draft questionnaire was submitted to three experts: one in Educational Technology, one in Social Studies Education, and one in Measurement and Evaluation at the University of Calabar. Their corrections and suggestions were used to revise the final instrument. A pilot study was conducted with 10 teachers from schools in Calabar South Local Government Area, which is outside the area of the study. The responses were analyzed using Cronbach's Alpha to determine internal consistency. A reliability

coefficient of 0.75 was ascertained and considered acceptable for the instrument. The researchers personally visited the selected schools to administer the questionnaire. A brief explanation was given to the respondents before completion. The entire process spanned two weeks, ensuring all sampled teachers were reached and responses retrieved.

The data collected were analyzed using description statistics of mean and standard deviation, and inferential statistics to test the hypotheses. The hypotheses were tested using Pearson Product Moment Correlation (PPMC), and independent samples t-test. All hypotheses were tested at 0.05 level of significance using SPSS version 26.

Presentation of results

Ho1: There is no significant relationship between the use of AI tools and the extent of curriculum delivery in Civic and Social Studies.

Table 1: Pearson Product Moment Correlation on the relationship between AI use and curriculum delivery

Variables	$\bar{x}$	**SD**	**r**	**p-value**
AI use	8.51	2.01		
			0.512	0.001
Curriculum Delivery	13.02	3.33		

The result in Table 1 presents the Pearson Product Moment Correlation analysis on the relationship between AI use and curriculum delivery. The result shows that AI use has a mean score of 8.51 with a standard deviation of 2.01, while curriculum delivery has a mean score of 13.02 and a standard deviation of 3.33. The correlation coefficient (r) between AI use and curriculum delivery is 0.512. This indicates a moderate positive relationship between the two variables. Furthermore, the p-value of 0.001 is less than the 0.05 level of significance ($p < 0.05$), which means that the relationship is statistically significant. The finding implies that an increase in the use of artificial intelligence is associated with a corresponding improvement in curriculum delivery. Since the relationship is statistically significant, the null hypothesis stating that there is no significant relationship between AI use and curriculum delivery is therefore rejected, while the alternative hypothesis is accepted.

Ho2: There is no significant relationship between the use of AI and adoption of student-centred teaching approaches.

Table 2: The relationship between the use of AI and adoption of student-centred teaching approaches

Variables	$\bar{x}$	SD	r	p-value
AI use	7.48	1.99		
			0.478	0.003
Adoption of student-centred teaching approaches.	13.02	3.33		

To test this hypothesis, a Pearson Product Moment Correlation Coefficient was computed to examine the strength and direction of the relationship between teachers' use of AI and their adoption of student-centred instructional approaches in the delivery of Civic and Social Studies content. The result is presented in Table 2. The result shows that AI use has a mean score of 7.48 with a standard deviation of 1.99, while adoption of student-centred teaching approaches has a mean score of 13.02 and a standard deviation of 3.33. The correlation coefficient (r) is 0.478. This indicates a moderate positive relationship between AI use and the adoption of student-centred teaching approaches. The p-value of 0.003 is less than the 0.05 level of significance ($p < 0.05$), indicating that the relationship is statistically significant. The finding implies that increased use of artificial intelligence is associated with greater adoption of student-centred teaching approaches. This suggests that AI enhances teaching practices by promoting learner participation, personalization, and interactive instructional methods. Since the relationship is statistically significant, the null hypothesis which states that there is no significant relationship between AI use and the adoption of student-centred teaching approaches is therefore rejected, while the alternative hypothesis is accepted.

Ho3: There is no significant difference in perceived effectiveness of AI-driven instruction on student engagement between AI-using and non-AI-using teachers.

Table 3: Independent samples t-test of the difference in perceived effectiveness of AI between those who use AI and those who do not use AI.

Group	N	$\bar{x}$	SD	t	p-value
AI Users	18	3.21	0.51		
Non-AI users	37	2.84	0.60	2.33	0.023

To test this hypothesis, an independent samples t-test was conducted to determine whether there is a statistically significant difference in the perception of AI effectiveness between Civic and Social Studies teachers who used AI tools and those who do not. The result is presented in Table 3. The independent samples t-test shows that AI users ($\bar{x}$ = 3.21, SD = 0.51) rated the effectiveness of AI in Civic and Social Studies education significantly higher than non-AI users ($\bar{x}$ = 2.84, SD = 0.60). The t-value is 2.33, with a p-value of 0.023, which is less than the 0.05 significant level. Therefore, the null hypothesis (Ho3) is rejected. This result suggests that teachers who use AI tools perceive them as significantly more effective for instructional delivery than their counterparts who do not use AI.

Discussion of the findings

The finding from Ho1 indicates that AI use significantly correlates with curriculum delivery supports the assertion that technology-enhanced teaching improves instructional outcomes. This result aligns with the findings of Okoye and Ede (2022), who reported that digital platforms such as intelligent tutoring systems and AI-generated learning content can enhance the pace, quality, and relevance of curriculum delivery in secondary education. The positive association also mirrors the observations by Chukwuma and Ikwuagwu (2023), who found that AI-powered lesson planning and content generation assist teachers in addressing curriculum targets more efficiently and adapting instruction to learners' needs. Teachers using AI tools may have access to more diverse and tailored learning resources, real-time feedback systems, and automated assessment mechanisms, all of which streamline lesson execution and promote learner engagement.

The finding from hypothesis two indicates that increased use of AI by teachers is associated with a greater tendency to implement student-centred instructional strategies, such as flipped classrooms, problem-solving tasks, individualized learning, and project-based learning. This result aligns with contemporary research literature suggesting that Artificial Intelligence can serve as an enabler of student-centred learning in modern classrooms. AI tools support personalization, adaptive learning, real-time feedback, and interactive simulations, all of which shift the instructional focus from teacher-led lectures to learner-

driven exploration and participation. For instance, Obi and Odu (2021) found that teachers who integrated AI applications in Social Studies were more likely to implement project-based learning, peer collaboration, and formative assessments that foster critical thinking and learner autonomy.

The finding from hypothesis three revealed that teachers who use AI tools significantly perceived it to be more effective for instructional delivery than those who do not use AI. This finding is supported by previous empirical studies. Aderibigbe and Adamu (2021) found that professional development workshops significantly improved teachers' perception and willingness to adopt educational technologies, including AI applications. Similarly, Oluwabunmi and Ayeni (2022) concluded that trained teachers were more likely to explore or use the full potentials of AI for lesson planning, real-time student feedback, and differentiated instruction in Social Studies.

Conclusion

The study concludes that although Artificial Intelligence is recognized as a transformative tool in education, its implementation in Civic and Social Studies curriculum delivery in secondary schools in Calabar Municipality is still limited. Where AI is used, it supports a shift toward more student-centred and engaging pedagogies.

Recommendations

Based on the findings, it was recommended that:

1. The Ministry of Education and educational stakeholders should organize regular workshops and professional development programmes focused on AI literacy and pedagogical integration.
2. Government and school administrators should invest in reliable internet access, electricity, and AI-compatible devices to facilitate technology-enhanced teaching.
3. The Civic and Social Studies curriculum should be updated to incorporate AI-based learning objectives and digital competencies.
4. Policies should incentivize AI integration in public schools.
5. Educational technology providers, NGOs, and universities should collaborate to create and share AI-powered learning platforms tailored to Civic and Social Studies content.
6. Interventions should prioritize schools in under-resourced areas to prevent the widening of the digital divide and ensure inclusive access to AI-enhanced learning opportunities.

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