

**EXPLORING ARTIFICIAL INTELLIGENCE (AI) FOR
SOCIAL STUDIES INSTRUCTIONS: PREPARING
TEACHERS FOR THE DIGITAL AGE**

Philips Tope **FASEMNIKAN**

*Department of Training and Research, National Institute for
Educational Planning and Administration (NIEPA),
Ondo, Ondo State*

Abstract

This paper examined the adoption of Artificial Intelligence (AI) in teaching Social Studies in the context of preparing Nigerian educators to teach in the digital age. It employed descriptive survey research design wherein 300 teachers of Social Studies in secondary schools in the Ondo West Local Government Area of Ondo State were sampled using the simple random sampling method. Information was gathered using a structured questionnaire, which proved to be very reliable (Cronbach's Alpha =0.82). The findings are that teaching professionals believe that AI has a massive learning potential, but they also face colossal challenges, including a lack of training, inadequate infrastructure, and a non-specific policy. Most significantly, the study determined that there was good consensus among teachers on what were considered to be desirable preparation practises; practical training, revision of the curriculum, group learning, permanent professional development and robust investments into infrastructures. The research proposes to pay attention to practical training, development of a national AI-curriculum, collaborative learning, continuous professional

development, and significant investment in digital infrastructure as the most constructive means of integrating AI in the learning of Social Studies.

Keywords: *Integration, Artificial intelligence, Digital age, Implementation, Instructions*

Introduction

The digital age has brought about a period of revolution thus altering the education of the world drastically. This transformation in Nigeria necessitates a critical examination of the historical pedagogical procedures, particularly in teaching of Social Studies. By definition, students are supposed to be given knowledge, skills, and values by the subject matter to make them able to address complex challenges in society and become worthy members of a democratic society (Adamu, 2018). Rapid changes in the sphere of artificial intelligence (AI) however, do not only provide the opportunity to achieve these educational objectives, but pose also serious threats.

Artificial intelligence as the most common perception of this concept, which refers to the simulation of the human intelligence process through the use of a machine (Russell & Norvig, 2016), has now entered various sectors, and the educational sector is no exception. AI tools have the potential to provide a personalised learning experience, assessment, intelligent tutoring, and information about student performance that is based on data (Chen et al., 2020; O'Neil & Multiple, 2021). In the Social Studies context, AI can also open up a range of historical records, simulate complex social scenarios in order to learn about them, and even assist in the development of critical thinking skills through the use of an interactive Sim (Nwachukwu, 2022). One such example is that artificial intelligence can be utilised to do virtual field trips to historic places or enable students to study multiple perspectives on modern global issues through artificial intelligence-driven dialogue agents.

Nonetheless, the use of AI in the Nigerian Social Studies curriculum is still in its infancy despite the prospects of AI in education that are broadly acknowledged. Even though it can be accurate that a few privately governed institutions are testing AI use, the application of this technology to mass education in publicly funded schools has stagnated because of a multitude of reasons, including inadequate infrastructure, ineffective teacher digital literacy, or the lack of any policy guidelines (Ogunyemi, 2020). This issue is critically concerning considering the trend toward the integration of AI in the educational sector that has reached across the globe, which means that countries falling behind in this migrant process are bound to be left behind the curve in preparing their citizens to live in an increasingly technological world (World Bank, 2019).

It is, therefore, a priority to ensure that the teachers in Nigeria are prepared to enter this digital age, particularly, in terms of introducing AI into the process. Many of the current teachers have been trained at the time when AI was not popularised in the first place; that is why they lack the necessary skills to use those resources in their classrooms (Uche & Eze, 2017). This disjuncture threatens to spawn the further development of historic, teacher-centred pedagogies which do not necessarily prepare the learners with the requirements of a digitally-oriented world (Aliyu, 2023). The answer to this would not only be to enable AI tools but also to enable teachers with the pedagogical knowledge and skills to utilise AI in a prudent and moral way in their teaching practises. This includes the understanding of how AI may support differentiated learning, collaborative learning, and how AI may facilitate critical inquiry of Social Studies (Jones & Smith, 2024).

Although AI is able to revolutionise the process of teaching Social Studies, it has been noted that its adoption in the Nigerian classrooms is far behind the usual pace with an apparent gap in the teacher preparedness. The majority of the Social Studies teachers in Nigeria lack knowledge, skills, and resources that would allow them to utilise AI tools efficiently, and therefore they still teach their students using traditional methods that may not be adequate enough to make them skilled in the digital age. Lack of adequate

infrastructure and clear policy direction on how AI can be integrated only compounds the problem and ultimately deprives students of a rich learning experience and training them on how to survive in a world filled with technology. This study aims to explore the multifaceted aspects of integrating artificial intelligence into Social Studies instructions in Nigeria. Specifically, it seeks to:

1. find out the current perceptions of teachers regarding artificial intelligence for Social Studies instructions;
2. identify the opportunities associated with artificial intelligence implementation for Social Studies instructions;
3. determine the challenges associated with artificial intelligence implementation for Social Studies instructions; and
4. propose strategies for effective teacher preparation for artificial intelligence implementation for Social Studies instruction in this digital age.

Research Questions

The following research questions are raised for the study:

1. What are the current perceptions of teachers regarding artificial intelligence for Social Studies instructions?
2. What are the opportunities associated with artificial intelligence implementation for Social Studies instructions?
3. What are the challenges associated with artificial intelligence implementation for Social Studies instructions?
4. What are the strategies for effective teacher preparation for artificial intelligence implementation for Social Studies instruction in this digital age?

Methods

The descriptive survey was the research design used in the present study. All the teachers of Social Studies, who are currently teaching in the public and private secondary schools of the Ondo West Local Government Area of Ondo State, Nigeria, were included in the population of this study. As a sample of the

identified population, a sample of 300 Social Studies teachers was chosen. Simple random sampling technique was applied to ensure that every teacher in the population had the same likelihood of being selected. The primary research tool that was applied in data collection was a structured questionnaire. Close-ended statement questions were used in developing the survey to get detailed information on the uses of artificial intelligence in teaching Social Studies by teachers. The test validity of the research tool was determined by testing a pilot study with another set of Social Studies teachers not part of the study sample. In order to determine the degree of reliability and consistency of the instrument a Cronbach's Alpha of 0.82 was found. The analysis of data collected was done using descriptive statistics. Frequencies and means were used to answer the research questions.

Results

Research Question 1: What are the current perceptions of teachers regarding artificial intelligence for Social Studies instructions?

Table 1: Perceptions of teachers regarding artificial intelligence for Social Studies instructions

| S/N | Items | SA | A | D | SD | Mean | Remarks |
|-----|--|-----|-----|----|-----|------|-----------|
| 1 | I believe artificial intelligence can significantly enhance student engagement in Social Studies lessons | 138 | 144 | 6 | 12 | 3.36 | Agreed |
| 2 | I feel confident in my ability to explain basic AI concepts to my Social Studies students | 120 | 144 | 24 | 12 | 3.24 | Agreed |
| 3 | AI tools are currently accessible and easy to use for Social Studies instruction in my school | 15 | 24 | 87 | 174 | 1.60 | Disagreed |
| 4 | I perceived AI as not a potential threat to the role of human teachers in Social Studies education | 135 | 117 | 33 | 15 | 3.24 | Agreed |
| 5 | I am enthusiastic about incorporating AI into my Social Studies teaching methods | 225 | 75 | 0 | 0 | 3.75 | Agreed |

Mean Cut-off point = 2.50

Table 1 shows that majority of the respondents agreed that; they strategies for effective teacher preparation for artificial intelligence implementation for Social Studies instruction in this digital (mean = 3.36), they feel confident in their ability to explain basic AI concepts to my Social Studies students (mean = 3.24), they perceived AI as not a potential threat to the role of human teachers in Social Studies education (mean = 3.24), they are enthusiastic about incorporating AI into their Social Studies teaching methods (mean = 3.75). However, they disagreed that AI tools are currently accessible and easy to use for Social Studies instruction in their school (mean = 1.60).

Research Question 2: What are the opportunities associated with artificial intelligence implementation for Social Studies instructions?

Table 2: Opportunities associated with artificial intelligence implementation for Social Studies instructions

| S/N | Items | SA | A | D | SD | Mean | Remarks |
|-----|---|-----|-----|----|----|------|---------|
| 1 | AI can provide personalized learning experiences for diverse student needs in Social Studies | 123 | 171 | 3 | 3 | 3.38 | Agreed |
| 2 | Using AI tools can help students develop critical thinking and problem-solving skills in Social Studies | 177 | 96 | 15 | 12 | 3.46 | Agreed |
| 3 | AI offers opportunities to access a wider range of historical documents and cultural resources for Social Studies | 141 | 144 | 15 | 0 | 3.42 | Agreed |
| 4 | AI can effectively automate repetitive tasks, freeing up teaches to focus on more creative Social Studies instruction | 225 | 75 | 0 | 0 | 3.75 | Agreed |
| 5 | AI-powered simulations can significantly improve students' understanding of complex societal issues in Social Studies | 75 | 111 | 81 | 33 | 2.76 | Agreed |

Mean Cut-off point = 2.50

Table 2 shows that majority of the respondents agreed that; AI can provide personalized learning experiences for diverse student needs in Social Studies (mean = 3.38), using AI tools can help students develop critical thinking and problem-solving skills in Social Studies (mean = 3.46), AI offers opportunities to access a wider range of historical documents and cultural resources for Social Studies (mean = 3.42), AI can effectively automate repetitive tasks, freeing up teaches to focus on more creative Social Studies instruction (mean = 3.75), AI-powered simulations can significantly improve students' understanding of complex societal issues in Social Studies (mean = 2.76).

Research Question 3: What are the challenges associated with artificial intelligence implementation for Social Studies instructions?

Table 3: Challenges associated with artificial intelligence implementation for Social Studies instructions

| S/N | Items | SA | A | D | SD | Mean | Remarks |
|-----|--|----|-----|-----|----|------|---------|
| 1 | Lack of adequate training in AI tools is a major challenge for implementing AI in Social Studies instruction | 72 | 156 | 60 | 12 | 2.96 | Agreed |
| 2 | Insufficient access to reliable internet connectivity hinders the effective use of AI in my Social Studies classroom | 90 | 96 | 96 | 18 | 2.88 | Agreed |
| 3 | The cost of acquiring and maintaining AI technologies for Social Studies instruction is prohibitive | 96 | 93 | 90 | 21 | 2.88 | Agreed |
| 4 | I am concerned about the ethical implications and data privacy issues when using AI in Social Studies lessons | 30 | 132 | 105 | 36 | 2.54 | Agreed |
| 5 | There is a general lack of clear guidelines or curriculum frameworks for integrating AI into Social Studies in Nigeria | 72 | 120 | 96 | 12 | 2.84 | Agreed |

Mean Cut-off point = 2.50

Table 3 shows that majority of the respondents agreed that; lack of adequate training in AI tools is a major challenge for implementing AI in Social Studies instruction (mean = 2.96), insufficient access to reliable internet connectivity hinders the effective use of AI in my Social Studies classroom (mean = 2.88), the cost of acquiring and maintaining AI technologies for Social Studies instruction is prohibitive (mean = 2.88), they are concerned about the ethical implications and data privacy issues when using AI in Social Studies lessons (mean = 2.54), there is a general lack of clear guidelines or curriculum frameworks for integrating AI into Social Studies in Nigeria (mean = 2.84).

Research Question 4: What are the strategies for effective teacher preparation for artificial intelligence implementation for Social Studies instruction in this digital age?

Table 4: Strategies for effective teacher preparation for artificial intelligence implementation for Social Studies instruction in this digital

| S/N | Items | SA | A | D | SD | Mean | Remarks |
|-----|--|----|-----|-----|----|------|---------|
| 1 | Providing hands-on workshops and practical training sessions is crucial for preparing teachers for AI in Social Studies | 84 | 108 | 108 | 18 | 2.98 | Agreed |
| 2 | Developing a national curriculum that integrates AI competencies for Social Studies teachers is essential | 93 | 66 | 63 | 78 | 2.58 | Agreed |
| 3 | Collaborative learning communities where teachers can share experiences with AI in Social Studies are vital | 51 | 123 | 66 | 60 | 2.55 | Agreed |
| 4 | Continuous professional development programmes on emerging AI technologies should be mandatory for Social Studies teachers | 87 | 75 | 72 | 66 | 2.53 | Agreed |
| 5 | Investment from the government and school proprietors in upgrading school infrastructure to support AI tools is a necessary preparation strategy | 75 | 111 | 81 | 33 | 2.76 | Agreed |

Mean Cut-off point = 2.50

Table 4 shows that majority of the respondents agreed that; providing hands-on workshops and practical training sessions is crucial for preparing teachers for AI in Social Studies (mean = 2.98), developing a national curriculum that integrates AI competencies for Social Studies teachers is essential (mean = 2.58), collaborative learning communities where teachers can share experiences with AI in Social Studies are vital (mean = 2.55), continuous professional development programmes on emerging AI technologies should be mandatory for Social Studies teachers (mean = 2.53), investment from the government and school proprietors in upgrading school infrastructure to support AI tools is a necessary preparation strategy (mean = 2.76).

Discussions

The current perception of teachers towards the use of artificial intelligence to teach Social Studies is mostly positive and favourable. In addition, teachers also believe that AI can be used to enhance the engagement of students enrolled in Social Studies courses and most of them feel that they could easily explain to their students the basic concepts of AI. In addition, they do not view AI as something that threatens their lives as human teachers and embrace the notion of applying AI to their teaching processes. However, the major barrier to their perception is that at the moment, the AI tools are not easily accessible and convenient to be used in their school environment. These results and findings are in line with and out of line with past studies that researchers such as Chen et al. (2020) point to the ability of AI to offer personalised learning and enhanced student performance. Similarly, Nwachukwu (2022) suggested that Nigerian teachers should consider the usefulness of AI in their profession in the future. The given measure of the trust in the capacity of teachers to provide the understanding of the simplest notions of AI is an encouraging indicator, the bare minimum of digital literacy, which Aliyu (2023) explained as the fundamental element of educator readiness in the 21st century. However, the intense debate against the accessibility and affordability of AI-powered technologies in educational

institutions directly supports the infrastructural concerns perpetuity that Ogunyemi (2020) presents on the incorporation of ICT in government schools in Nigeria. Even in the case of positive perceptions, this particular barrier highlights an important implementation gap.

The results of the study reveal that the overall perception of teachers related to the introduction of an artificial intelligence solution into the process of teaching Social Studies is rather positive and has a large number of opportunities. These are not limited to the opportunities that AI can offer to individualised learning to various student needs. Educators are also aware of the ability of AI to encourage students to think critically and solve problems. One of the most apparent perceived advantages is that AI enables the automation of routine functions, hence, enabling teachers to spend more time on innovative and creative methods of teaching. Finally, educators admit that AI-driven simulations will be able to contribute significantly to the understanding of the complex issues in society among students. Such findings have much in common with those of Chen et al. (2020) who performed a systematic review of AI in the education field and expressed the significance of AI in adaptive learning pathways. Similarly, the perceived possibility of AI emerging as a tool of critical thinking and problem solving can also be found in other works of scholars such as Jones and Smith (2024) who have gone further to contextualise the pedagogical approach of introducing AI in the Social Studies classrooms to achieve such ends.

The results of the study suggest that there exist a set of circumstances that present serious obstacles to successful application of artificial intelligence in educational activities in Social Studies. It is widely believed among educators that the most notable obstacles are the lack of training on how to use AI tools, the untrustworthiness of the internet connexion, and the very high cost of acquiring and maintaining AI technologies. Also, the use of AIs in the classroom brings other concerns, namely, the ethical considerations and privacy of the data that may be implied by teachers. There is also a superior sentiment that no transparent

guidelines or curriculum frameworks can assist in applying AI to Social Studies in the Nigerian context. The specified results are quite consistent with what Uche and Eze (2017) observed when highlighting the inadequacy of teacher training insofar as the Information and Communication Technology (ICT) integration in secondary schools in Nigeria is concerned. In addition, the raised issues regarding ethical considerations and data privacy are also reflective of the general discourse on the responsible use of AI in education discussed on a larger scale across the world (O'Neil & Multiple, 2021; UNESCO, 2021). This absence of policy and curriculum frameworks identified in the present study, also attests to the general lack of strategic direction that is often discussed when discussing the educational technology adoption in Nigeria, although not explicitly covered by Adamu (2018) when discussing educational reforms in general.

Findings of the study show that there is a great agreement among the teachers of Social Studies on the strategies of preparing to implement AI in their teaching. The practical and hands-on training and workshops are regarded as the key to the acquisition of the required AI competencies by an overwhelming majority of teachers. They also emphasise on the nature of national curriculum where AI skills will be in place in context of teachers of Social Studies, development of collaborative learning opportunities, and necessity of permanent professional development courses of the newest AI technologies. Moreover, it is also admitted plainly that the government and school owners will play a pivotal role in the investment in better school infrastructure to adequately support the use of AI tools in the classroom. These findings are quite consistent with what the current literature claims of teacher preparation with regard to the incorporation of technology and artificial intelligence in learning. The emphasis on the practical training aligns with the thoughts of the majority of scholars on the importance of practical and experience-based training that is better than the purely theoretical one (Uche & Eze, 2017).

The collaborative learning community as an experience and sharing of best practise value apply to the research findings of the Aliyu (2023) study, which found peer support as a need in the digital literacy acquisition of Nigerian teachers. Finally, the identified need of government and owner investment in infrastructure directly support the stance of Ogunyemi (2020) who had discovered poor infrastructure as one of the key barriers to ICT adoption within the Nigerian schools that also extends to more modern technologies like AI.

Conclusion

In conclusion, the results show that there is generally awareness and an agreement among the educators regarding the potential positive sides of AI in generating student interest and enhancing performance and learning within the Social Studies. However, significant problems are involved in the wide use of AI, and these problems are connected with the insufficient preparation, the adequate infrastructure, and clear policy frameworks. All this points to making the realisation that despite the awareness of the Nigerian Social Studies-teachers as to the importance of AI in the digital age, a multi-dimensional and concerted action is required to eliminate the wrinkles that are present and bring them into the digital age of paradigm-level of change.

Recommendations

Based on the results, the paper recommended firstly, educational policymakers and teachers training organisations ought to develop and implement mandatory and practical workshops and training on the specific application of AI tools and resources with reference to the Social Studies teaching. Secondly, the Federal Ministry of Education along with other relevant agencies ought to hasten the process of developing national curriculum that directly includes the AI competencies among the teachers of all subjects and the Social Studies in particular. Thirdly, the school leaders and professional bodies should keep in mind the idea to implement and support collaborative learning communities (PLCs) or

teacher-teacher networks of Social Studies educators. Finally, since the rate at which the AI is developing is very high; therefore, every teacher must be required to take up continuous professional development programmes on the new emerging AI technologies and utilisation in the teaching of Social Studies.

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