REPOSITIONING BUSINESS EDUCATION UNDERGRADUATE CURRICULUM FOR STUDENTS' EMPOWERMENT IN AGRIBUSINESSES AND HUNGER ERADICATION IN NIGERIA

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Abstract
The necessity of achieving the sustainable development goal of zero hunger, food security and improved nutrition in Nigeria and other developing nations of the world through a functional curriculum and innovative pedagogies warranted this study. The study examined the extent Business Education curriculum has empowered university students for agribusinesses and the achievement of hunger eradication in Nigeria. The study addressed four research questions and tested two hypotheses. Employing a descriptive survey design, the population comprised 2,346 penultimate and final-year Business Education university undergraduates, 44 Business Education lecturers, and 35 Curriculum Experts. Due to logistical constraints, the Taro Yamane sample size formula was applied, resulting in a sample of 727 undergraduates, 25 lecturers, and 24 curriculum experts. Data collection tools included a questionnaire and a focus group discussion guide. The reliability of the instruments was assessed using Cronbach Alpha, yielding an average internal consistency index of 0.85. Data analysis was conducted using Mean, Standard Deviation, and Independent Sample T-tests at a significance level of 0.05. The findings revealed that students were not able to demonstrate adequate practical knowledge, skills and attitude of agribusinesses towards hunger eradication. The Business Education undergraduates are inadequately empowered to achieve the SDG 2030 of zero hunger. It is therefore recommended that Agribusiness Entrepreneurial Education should be added to the existing specializations and career options in Business Education programme to empower the recipients with skills and competences for zero hunger, food security, and improved nutrition in Nigeria. Experiential Instructional approaches should be prominent in the curriculum delivery for agribusiness and hunger eradication empowerment of students.

Keywords: **Business Education Curriculum, Hunger Eradication, Empowerment for Agribusinesses, Experiential Pedagogies, Sustainable Development Goals.**

Introduction

The pursuit of sustainable global economy through quality education becomes hightened in the developing nations where social, economic and environmental challenges are rampant. From the global statistics, Nigeria is reported to have 11.7 percent of the world population living below the poverty line (Galal, 2025). Eighty-four millions (37%) of people in Nigeria are living below the poverty line (World Food Programme, 2025). Nigeria has been identified as one of the countries in Africa that is suffering from a serious hunger problem with 31.5% of the children undernourished and with stunted growth (Global Hunger Index, 2024). The growing rates of hunger, food insecurity, and malnutrition, especially in developing countries, have raised significant concerns among education sector stakeholders. The 2023 report by the National Bureau of Statistics highlighted that many graduates, including those in business education, are affected by hunger, unemployment, underemployment, poverty, and economic instability. With the projection that the world population would reach 9.2 billion by the year 2050, there is need to improve the educational curriculum to adequately incorporate contents and instructional strategies that empower the recipients for achieving hunger eradication (Food and Agricultural Organisation, 2024).

A sure avenue for this development is through a functional education that is dynamic, entrepreneurial and vocational in nature and practice. The driver of every functional education is the curriculum and the instructional strategies. As reported in the policy brief of United States Agency International Development (USAID), the strategies for improving food security through education include school agriculture, school feeding programme, and basic literacy and learning. Ehui (2024) and International Institute of Tropical Agriculture (IITA), in 2017, acknowledged the concentrated effort of the government to promote food commodity markets as a potential strategy to achieving the SDG of zero hunger, food security, and improved

nutrition by 2030. However, one of the reasons for hunger and malnutrition in Nigeria is the shallow involvement of people in the production or marketing of agricultural products. Pawlak and Kolodziejczak (2020) identified some factors such as climate change, conflict, natural disasters, war and poverty as major causes of hunger and malnutrition in the society. A lot of farm produce is perishing at the point of production because of lack of means of transportation to the urban where they are needed most due to their population density. Even though some commendable effort were being made by the government of Nigeria to implement some of the strategies previously mentioned, the real empowerment for food security and hunger eradication begins with curriculum and instruction (Ehui, 2024). It is therefore necessary to expand entrepreneurial frontier of business education students and graduates through emphasis on agribusinesses in the curriculum for the achievement of hunger eradication in Nigeria.

Mgbenyi, et al (2022) explained the concept of agribusiness to encompass both on-farm and off-farm endeavours. In other terms, agribusiness includes all farms and businesses engaged in the production, harvesting, packaging, processing, preservation, distribution, marketing, and disposal of both food and non-food agricultural products. Agribusiness is said to have the potential of creating inclusive growth and jobs, as well as building sustainable economy. Since functional education serves as a major mechanism for sustainable growth and development of any economy, therefore, there is urgent need to revitalize the curriculum content and instructional practices of Business-oriented disciplines to incorporate capacity building and empowerment of learners for the attainment of SDGs 2030 and beyond. Olayemi, et al (2019) opined that agricultural output has the capacity to reduce poverty level in any economy. Therefore, educational institutions and curricula contents of Business-oriented programmes should promote the acquisition of knowledge, skills and attitudes of agribusinesses for the sustainability of Nigerian and African society. Eze and Chinedu-Eze (2016) lamented the gross decline in the youth participation in agripreneurship in Nigeria. The authors therefore suggested the need to revamp the vocational education curriculum at tertiary institutions to fully promote the teaching and learning of agribusiness for the purpose of attaining food security and achieve the SDG of zero hunger in Nigeria and other developing countries of the world. Business Education curriculum and instruction need to be reviewed to inculcate relevant competences for agribusiness empowerment in the students in order to produce graduates well-equipped to drive the Nigerian economy into sustainability in terms of zero hunger and food security.

Research Questions

The following research questions were answered in the study:

1. To what extent are agribusiness and hunger eradication contents addressed in the Business Education undergraduate curriculum in Nigeria?
2. To what extent are the skills and abilities for agribusinesses and hunger eradication demonstrated by Business Education undergraduates in Nigeria?
3. What is the extent to which attitudes and values for agribusinesses and hunger eradication are demonstrated by Business Education undergraduates in Nigeria?
4. To what extent are certain innovative instructional strategies used in Business Education undergraduate programme practically address agribusiness and hunger eradication in Nigeria?

Research Hypotheses

Ho1: There is no significant difference between the opinions of curriculum experts at federal and state universities on the extent Business Education undergraduate programme addresses agribusinesses and hunger eradication in Nigeria.

Ho2: There is no significant difference between the opinions of federal and state Business Education undergraduates on the extent to which innovative instructional strategies used practically address agribusinesses and hunger eradication in Nigeria.

Literature Review

As a skills-based education programme, the business education curriculum aims to build students' capabilities through entrepreneurial and educational content, along with effective teaching strategies (National Universities Commission (NUC), 20I8). In Nigeria, business education undergraduate programme is being offered at both federal and state universities. In spite of the present limited number of universities running business education programme in Nigeria, there is a unified, approved and standardized curriculum, otherwise known as Benchmark Minimum Academic Standard (BMAS) for all universities. This BMAS for

business education programme has undergone some reviews for the purpose of empowering the recipients with twenty-first century competences necessary for sustainability achievement. In order to achieve any sustainable development in the society in terms of food security or hunger eradication, the education curriculum and instruction must be adequately relevant to the goals (Onoja, Odumu & Moses-Ojo, 2024). The assessment of business education curriculum is therefore necessary in order to ascertain its potency in solving the problems of unemployment, hunger, food insecurity, malnutrition, and other related problems in Nigeria through innovative curriculum and pedagogical practices.

Curriculum encompasses all the activities and experiences that educational institutions provide to students to help them achieve the intended objectives. Igwe (2011) described curriculum as an ongoing series of events that are vital for transforming educational goals into tangible activities, resources, and visible changes in behavior. Therefore, business education undergraduate curriculum is the sum total of experiences to which students are exposed for sustainable empowerment opportunities in Nigeria. Sustainable development is the process of actualising today's goals and objectives while creating opportunities for future generations achieve their goals. (Patrick, Enakshi, and Mandla, 2018). The primary aim of sustainable development goals is to eradicate poverty and hunger, foster economic growth, social inclusion, and environmental sustainability, while also addressing other urgent global issues, particularly in developing nations. UNESCO (2021) defined hunger as a signal received when the stomach is empty of food and it causes the blood sugar level to reduce. On the other hand, malnutrition occurs when there is a prolonged absence of food in the body which causes weight loss and dysfunctionality. According to the International Institute of Tropical Agriculture (IITA, 2017), 'zero hunger" as one of the sustainable development goals (SDGs, 2030) means having enough nutritious and safe food to eat. Food security entails availability, access, utilization and stability of hygienic and nutritious food in the society (Fahy, 2021). However, the situation in Nigeria which is evident by lack of enough food to eat for majority really confirms the necessity of pursuing and achieving the sustainable development goal of "zero hunger" or hunger eradication before 2030. Achieving the SDG of "zero hunger" makes it imperative for the Nigerian economy to create more sustainable opportunities for agricultural investment.

Nwozor and Olanrewaju (2020) argued that in spite of the several opportunities for productive practices in agriculture for local and international relevance, Nigeria is still playing insignificant role in the global food market. The universities, colleges of agriculture, and vocational education and training schools need to emphasise the inculcation of competences for establishing and engaging in decent employment and agribusinesses. It is not only Agriculturists that are needed to achieve zero hunger and food security in the society. Every field of study is expected to align its curriculum and learning strategies towards the achievement (Shafie, Kamis & Ramli, 2021). Business education, as a field of study should explore agribusinesses as career options through effective capacity building and collaboration with NGOs that specialize in the production and marketing of agriproducts for the realization of zero hunger and food security in the nation. Ikuemonisan (2024) emphasizes the imperative of collaboration among stakeholders in the education sector to promote the teaching and learning of agribusiness entrepreneurship in business-oriented programmes for the achievement of the sustainable development goal of zero hunger in the year 2030. As a vocational education, Business Education Programme should play an active role in achieving the SDG of "zero hunger" in the society (Ugwuogo & Udu, 2016). This can be attained through innovative and dynamic curriculum contents and pedagogical practices that practically empower the recipients in agricultural businesses as a viable entrepreneurial undertaking. It should therefore be the priority of the Business Education curriculum to have adequate contents that can guarantee the achievement of SDG of "zero hunger" since the quality of food intakes of individuals goes a long way in determining the health condition of the people.

Curriculum Contents and Innovative Instructional strategies for Agribusinesses and Hunger Eradication

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) in 2017 highlights some relevant contents that should be incorporated into the school curriculum for empowering students to achieving hunger eradication in the nation. Notable among the contents suggested by UNESCO (2017) are the concept of hunger and malnutrition; cases of hunger problems in the society; and sustainable empowerment opportunities to reduce hunger to zero level in the society. Business Education university curriculum in Nigeria seems to ignore the exploration of viable entrepreneurial opportunities in

agribusinesses, which are the direct avenues to achieve food security and hunger eradication in the society. There is need for proper orientation giving to students about the deplorable situation of hunger and malnutrition in the society. There should be a practical visit, through fieldwork, to places and people who are mostly affected by hunger and malnutrition in the society. The fieldwork of this nature will instill passion in the mind of the students to search for solutions to the identified problems. Adedokun (2021) stressed the exacerbation of food insecurity in Nigeria by the COVID-19 pandemic and the need to intensify collaborations between the school curriculum and the industry practices in the production and marketing of agricultural produce in order to attain the SDG of zero hunger by the year 2030.

Adole, et al (2024) emphasized the sustainable impact of vocational agricultural education on the overall development of the Nigerian economy as well as the attainment of the SDG of zero hunger and food security. The authors identified certain constraints to the effective teaching and learning of vocational agricultural education and suggested adequate funding, manpower training and development as recommendations for agropreneurial approaches at tertiary institutions. Since Business Education is also a vocational education, there is need for pedagogical collaborations among all the disciplines under the vocational and technology education programmes for effective acquisition of agribusiness knowledge, skills, attitudes and values in Nigeria. The specific area of collaboration between the Business Education programme and the industry in the attainment of the SDG of zero hunger is through the Student Industrial Work Experience Scheme (SIWES) programme. Deliberate effort should be made by the stakeholders of Business Education programme at tertiary institutions in Nigeria to collaborate with Non-Governmental Organisations (NGOs) that specialize in agribusiness to train and expose students to the best practices of producing and marketing agriproduce during SIWES for maximum food security in Nigeria and beyond Africa. In addition, students should be allowed to collaborate with some non-governmental organisations (NGOs) that practically solve hunger and malnutrition problems in the communities to learn the approaches and acquire relevant competences required for them become change agents that can equally solve hunger problems in the communities (Franco, Saito, Vaughter, Whereat, Kanie & Takemoto, 2018). Through several research approaches, students get to know the causes of hunger and malnutrition in the society and possible interventions that can bring a permanent solution would be identified and, possibly, implemented. Some of the sustainable empowerment opportunities students should be exposed to for hunger eradication include establishment and management of agricultural firms; marketing of agricultural produce; promotion of green entrepreneurship; establishment of social entrepreneurship, among others (UNCTAD, 2017; NBEA, 2020 & Chamindika, Byron & Adela, 2019) . Buttressing the need for innovative instructional strategies for achieving zero hunger through educational curriculum, Ukata, Wechie and Nmehielle (2017), Beadle (2020) and Howard (2018) and Hardin, Bhargava, Bothner, Browne, Kusano, Golrokhian, Wright, ZhuZeng & Agrawal (2016) emphasized the consistent use of student-centred, problem-solving and experiential learning strategies. Overwien (2016) emphasized the priority of internship and practical activities in the implementation process of education for sustainable development. These strategies are capable of empowering students to face and solve the tripartite problems and challenges of the twenty-first century. The pedagogical approaches that can adequately empower the students must combine formal, informal and non-formal education (Oviawe & Ehirheme, 2019). Achieving the sustainability of the global economy demands a shift in educational perspectives, including rethinking curricula, revising courses, and adapting teaching and learning methods to address the needs of both current and future generations (Osman et al., 2017; Silvia, Salvador, and Monica, 2018; Itari and Ugbe, 2018). The distinct characteristics of the 21st century, such as diverse career paths, evolving professional roles, changing workplace dynamics, and new technologies, make it essential to engage learners in more active and participatory learning. Additionally, Alao, Afuwape, Taiwo, and Muraina (2021) emphasized that Business Education instructors in Nigeria should expose students to various entrepreneurial opportunities within their communities to equip them with the skills needed to achieve the Sustainable Development Goals by 2030. Therefore, as vocational education students, business education students need to be empowered with knowledge and skills for entrepreneurial engagements in agribusinesses either as producers or as marketers.

Methodology

The study was focused on public universities in South-West Nigeria that offer undergraduate programs in Business Education. However, due to logistical limitations, the research was limited to one federal university and three state universities in the region. A descriptive research design was employed for the study. The

population consisted of 2,346 penultimate and final-year Business Education students, 40 Business Education lecturers, and 35 Curriculum Experts in South-West Nigeria. Curriculum Experts comprised both the selected Business Education lecturers and other lecturers from the Department of Curriculum Studies whose opinions were obtained on hunger-eradication content embedded in NUC-BMAS for Business Education programme. The sample size for this study consisted of 727 penultimate and final-year Business Education undergraduates, 25 Business Education lecturers, and 24 Curriculum Experts. The sample size was determined using the Taro Yamane (1973) formula. The justification for choosing the sample size formula and technique was because it is simple to use and allows every respondent to have equal chances of being chosen. The research instruments included a questionnaire and a focus group discussion guide. The internal consistency of the questionnaire was evaluated using the Cronbach Alpha correlation coefficient, resulting in an average index of 0.85. The collected data were analyzed using Mean, Standard Deviation, and Independent Sample T-tests at a 0.05 significance level. The decision rule was based on a calculated mean score of 3.00, with the following ranges: 4.5 and above indicated "to a very great extent," 3.5-4.49 for "to a great extent," 2.5-3.49 for "to a moderate extent," 1.5-2.49 for "to a low extent," and below 1.5 for "almost non-existent." Another decision rule, based on a calculated mean score of 2.50, was as follows: 3.5 and above for "fully addressed/demonstrated," 2.5-3.49 for "moderately addressed/demonstrated," 1.5-2.49 for "poorly addressed/demonstrated," and below 1.5 for "almost not addressed/demonstrated." Furthermore, decisions regarding the hypotheses were made based on the p-value. If the p-value was less than or equal to 0.05, the null hypothesis was rejected; if the p-value was greater than 0.05, the null hypothesis was accepted. The focus group discussions were conducted in each of the sampled universities using 10 randomly selected students in each of the institutions. The students were gathered into a separate classroom, under a relaxed atmosphere. The researchers initiated the discussion while the students' respondents elaborately elucidated their exposures and experiences of hunger eradication pedagogical strategies used by Business Education university lecturers. The focus group discussion lasted for an hour and all the responses were duly recorded using phones and tablets technological devices.

Results

Research Question One: To what extent are agribusiness and hunger eradication contents addressed in the Business Education undergraduate curriculum in Nigeria?

Table 1: Extent Business Education Undergraduates Curriculum Addresses Agribusinesses and Hunger Eradication in Nigeria.

S/N	Areas of Address	$\bar{x}$	S.D.	Remark
1.	Establishment and management of agribusinesses.	3.00	0.659	**MA**
2.	Production and distribution of agricultural produce.	2.58	0.654	**MA**
3.	Supply chain food safety management systems.	2.50	0.780	**MA**
4.	Training in food supply in the community.	2.50	0.722	**MA**
5.	Impact of climate change on food security.	2.13	0.612	**PA**
	Average (%)	**2.54**	**0.685**	**MA**

The results in table 1 showed that hunger eradication was moderately addressed ($\bar{x}$ =2.54 > 2.50; SD = 0.685) in the NUC-BMAS Business Education University undergraduate curriculum based on the experts' opinion. It is obvious from the results that the Business Education curriculum lacks adequate contents that can empower students for agribusinesses and marketing of agriproducts. The students ought to be exposed to practical entrepreneurial training in food supply, food security, and climate change.

Research Question Two: To what extent are the skills and abilities for agribusinesses and hunger eradication demonstrated by Business Education undergraduates in Nigeria?

Table 2: Extent to which Business Education Undergraduates Demonstrated Skills and Abilities for Agribusinesses and Hunger Eradication in Nigeria.

S/N	Skills and Abilities of Hunger Eradication	$\bar{x}$	S.D.	Remark
1.	Ability to manage agribusinesses and market farm produce.	2.44	0.870	**PD**
2.	Ability to take appropriate measures on nutrition.	2.36	0.757	**PD**
3.	Ability to collaborate with NGOs for food security and hunger elimination.	2.36	0.995	**PD**
	Average (%)	**2.39**	**0.874**	**PD**

The results in table 2 showed that business education undergraduates had poorly demonstrated ($\bar{x}$ =2.39 < 2.50; SD = 0.874) the skills and abilities relating to hunger eradication based on the lecturers' opinion. It is surprising to discover that business education undergraduates were poorly exposed to practical instructional activities of managing agribusinesses through collaboration with the NGOs.

Research Question Three: What is the extent attitudes and values for agribusinesses and hunger eradication are demonstrated by Business Education undergraduates in Nigeria?

Table 3: Extent to which Business Education Undergraduates have Demonstrated Attitudes and Values for Agribusinesses and the SDG of Hunger Eradication in Nigeria.

S/N	Attitudes and values of Hunger Eradication	$\bar{x}$	S.D	Remark
1.	Students appreciate the use of agribusinesses to meet the nutritional needs of the workforce.	2.40	0.764	**PD**
2.	Students promote rights to adequate food by marginalized and poor people.	2.48	0.823	**PD**
	Average (%)	**2.44**	**0.794**	**PD**

The results in table 3 showed that Business Education undergraduates had poorly demonstrated ($\bar{x}$ =2.44 < 2.50; SD = 0.794) the attitudes and values relating to hunger eradication based on the lecturers' opinion. In other words, students of Business Education undergraduate programme in Nigeria had not demonstrated positive attitudes that practically promote agribusinesses and making food available to marginalized people or to the orphanage throughout their study at the universities.

Research Question Four: To what extent are certain innovative instructional strategies used in Business Education undergraduate programme practically address agribusiness and hunger eradication in Nigeria?

Table 4: The Extent to which Certain Innovative Instructional Strategies Used in Business Education Undergraduate Programme Practically Addressed Agribusinesses and Hunger Eradication in Nigeria.

S/N	Item	$\bar{x}$	S.D	Remark
1	The use of case study researches to reduce hunger.	3.50	1.121	**GE**
2	Fieldwork and excursions to agribusiness organisations.	3.41	1.139	**ME**
3	Students joining other NGOs to campaign against food wastage.	3.31	1.261	**ME**
	Average (%)	**3.41**	**1.174**	**ME**

The results in table 4 showed that innovative instructional strategies that practically address hunger eradication were used to a moderate extent ($\bar{x}$ =3.41 > 3.00; SD = 1.174) in Business Education undergraduate programme. However, the report of qualitative assessment through focus group discussion showed that the lecturers did not evidently use these strategies. Even though it is exciting to discover that

business education undergraduates were greatly exposed to case studies researches on hunger eradication, certain instructional approaches such as excursions, collaborations with companies and NGOs through campaign involvement are found to be insufficiently implemented.

Testing of Research Hypotheses

Hypothesis One: There is no significant difference between the opinions of curriculum experts at federal and state universities on the extent Business Education undergraduate programme addresses agribusinesses and hunger eradication in Nigeria.

Table 5: Independent Sampled t-test on the extent Business Education Undergraduate Programme address Agribusinesses and Hunger Eradication at Federal and State Universities in Nigeria.

Institution	Number	Mean	S.D	df	P – value	Remark
State	14	12.357	2.373	22	0.470	NS
Federal	10	13.200	3.259			

The result presented in Table 5 indicated that the difference in the response of Experts at the sampled federal and state universities was found not significant ($df = 22$, $p > 0.005$). We therefore accept the null hypothesis. Therefore there is no significant difference between the opinions of curriculum experts in the federal and state universities on the extent to which the NUC BMAS Business Education undergraduate curriculum addresses the SDG of hunger eradication in Nigeria.

Hypothesis Two: There is no significant difference between the opinions of federal and state Business Education undergraduates on the extent to which innovative instructional strategies used practically address agribusinesses and hunger eradication in Nigeria.

Table 6: Independent Sampled t-test comparison of opinions of federal and state Business Education undergraduates on the extent to which innovative instructional strategies used by lecturers practically address agribusinesses and the SDG of hunger eradication.

Institution	Number	Mean	S.D	Tcal	df	P – value	Remark
Federal	586	36.78	6.677	14.782	725	0.000	S
State	141	27.64	6.249				

The t-test comparison showed that a difference which is statistically significant exists between the opinions of **federal** and **state** Business Education undergraduates on the extent to which innovative instructional strategies used by lecturers have addressed the SDG of hunger eradication in Nigeria ($t_{calculated} = 14.782$, $df = 725$, $p < 0.05$). We therefore reject the null hypothesis. It implies that the mean rating on the opinions of the federal university students is statistically higher compared with that of state university students.

Discussion of Findings

There are notable findings in this study on the extent business education undergraduate curriculum has empowered students for the achievement of Sustainable Development Goal of zero hunger in Nigeria. The findings in Table 1 revealed that the current edition of the Benchmark Minimum Academic Standard (BMAS) curriculum for business education undergraduate programme by the National Universities Commission (NUC) could only address the SDG of zero hunger to a moderate extent ($\bar{x}$ = 2.54; SD = 0.685). The findings of America (2014) and Umoru (2013) that business education undergraduate curriculum was deficient in adequate relevant content that can fully empower students for hunger eradication in Nigeria supported this finding. If the contents of NUC BMAS, as the umbrella of all academic curricula in the Nigerian universities, could not adequately address the SDGs, the potential of business education university curriculum to effectively empower the recipients for hunger eradication is therefore in doubt. Business education students need to be properly trained to solve the problem of hunger, food insecurity, and malnutrition in Nigeria through an innovative curriculum that positions students' entrepreneurial orientation and practices towards

agriculturally-related businesses. In order to adequately solve hunger problems in Nigeria, the curriculum of business education should also promote specific contents that train students to become producers and marketers of agricultural produce.

The findings in table 2 and 3 showed that business education students poorly demonstrated the skills and attitudes for the SDG of hunger eradication ($\bar{x}$ = 2.39; SD = 0.874; $\bar{x}$ = 2.44; SD = 0.794) during the course of study. Storey, Killian and O'Regan (2018) also buttressed the fact that business education curriculum could neither produce graduates for sustainability nor create sustainable empowerment opportunities for students towards hunger eradication. Unfortunately, business education graduates that are unemployed also experience poverty and hunger when they can easily seize the opportunity to venture into agribusinesses for personal and national emancipation. Entrepreneurial abilities of business education students and graduates seem to be limited to education, office and accounting jobs, whereas opportunities abound in agribusinesses. The Students Industrial Work Experience Scheme (SIWES) which students engage in for six months should be a useful avenue to connect them to non-governmental organisations (NGOs) that specialize in solving hunger problems in the communities through agribusinesses.

The major avenue for empowering students with skills and competences is the instructional strategy. Experiential learning strategy remains the most effective approach to practical teaching and learning. However, the results of the study in Table 4 showed that students were moderately exposed to experiential learning to empower them for hunger eradication ($\bar{x}$ = 3.41; SD = 1.174). Though the result in Table 4, item 1 ($\bar{x}$ = 3.50; SD = 1.121) showed that innovative instructional strategies were used to a great extent, the feedback of the focus group discussion conducted revealed that students were almost not exposed to experiential learning approaches at all. The study carried out by Akinyele, Oke and Bolarinwa (2017) corrobates the finding that business education lecturers did not adequately use innovative instructional strategies that can empower students for achieving the SDGs. On the contrary, the study of Tete, Limongi, de Almeida, and Borges (2014) supported the alternative finding in this study that innovative instructional strategies were used to a great extent. The researcher agrees to the findings of Akinyele, et al (2017) concerning the current state of instructional strategies in business education undergraduate programme. Periodic creation of awareness and campaign against food wastages and malnutrition should be part of students' preoccupations in the communities to develop their attitudes and values for hunger eradication, food security and improved nutrition.

Conclusion

This study has critically examined the opinions of students, lecturers and curriculum experts on the extent to which Business Education undergraduate curriculum has empowered students for agribusinesses and the achievement of the SDG of hunger eradication in Nigeria. The study therefore concluded that Business Education undergraduate curriculum contents and innovative instructional strategies have not been able to fully empower students for the achievement of agribusiness empowerment and the SDG of hunger eradication in Nigeria.

Recommendations

Based on the conclusions above, the following are the recommendations:

1. The Business Education curriculum contents for tertiary institutions in Nigeria should be reviewed to adequately address the sustainable development goal of zero hunger 2030. Specific content of agribusiness and food security should be included in the existing curriculum.
2. There should be constant practice of effective collaboration between the academic institutions and the industry for the training of Business Education students in agribusinesses to attain full food security in Nigeria. Deliberate effort should be made by the stakeholders and facilitators to invite experts in Agribusiness, food security from relevant non-governmental organisations (NGOs) to train students through internship, apprenticeship, workshops, and other work-integrated learning strategies throughout their years of study.
3. The instructional strategies used for Business Education courses should practically involve students in active learning about agribusinesses both within and outside the school environment. The facilitators and

lecturers should constantly use experiential learning strategies in every course on Agribusiness and food security rather than waiting for the SIWES programme only before they are involved in practical activities.

4. There should be a specialization and career option in Business Education programme at tertiary institutions named "Agribusiness Entrepreneurial Education" to empower the recipients with skills and competences for zero hunger, food security, and improved nutrition in Nigeria.

References

Adedokun, B. (2021). Nigeria's food insecurity and it's implications on sustainable development goal (SDG) 2 amidst the COVID-19 era. *Journal of Good Governance and Sustainable Development in Africa, 6*(5), 18-26.

Adole, E., Ayeh, O. L., Okonmanyi, B. O. & Umeh, C. R. (2024). Improving vocational agricultural education for industrial development in Nigeria: Agripreneurial approach *International Journal of Studies in Education, 20*(2), 353-359.

Akinyele, T. A., Oke, S. O. & Bolarinwa, F. F .B. (2017). Utilising innovative instructional strategies in the development of entrepreneurship skills in business education students in Ogun State, Nigeria. *IOSR Journal of Economics and Finance, 8(1)*, 78-83.

Alao, O. E., Afuape I. H., Taiwo A., & Muraina, Q. O. (2021). Empowering business education students for decent work and productive employment: Nigeria example. *Contemporary Educational Researches Journal. 11*(1), 27–38. https://doi.org/10.18844/cerj.v11i1.5306

America, C. (2014). Integrating sustainability into Business Education teacher training. *South African Journal of Education, 34*(3)*,* 1-8. http://www.sajournalofeducation.co.za

Beadle, J. (2020). *Addressing food insecurity: Experiential learning through entrepreneurship education in a second year career and technical education setting. Creative components, 471.* https://lib.dr.iastate.edu/creativecomponents/471

Chamindika, W., Byron, G., & Adela, J. M. (2019). Embracing entrepreneurship action through effectuation in social enterprise. *Social Enterprise Journal.* https://doi.org/10.1108.SEJ-08-2018-0053

Ehui, S. (2024). *IITA's 2024-2030 strategy: Science, research, and delivery innovations for African agrifood system transformation*. International Institute of Tropical Agriculture, Ibadan, Nigeria.

Eze, S. C., & Chinedu-Eze, V. (2016). Agripreneurship curriculum development in Nigerian higher institutions. *International Journal of Small Business and Entrepreneurship Research, 4*(6), 53-66.

Fahy, A. (2021). *What is food security*? www.concern.net>news>what-foo...

FAO. (2024). *FAO publications catalogue 2024.* Rome. https://doi.org/10.4060/cd2332en

Franco, I., Saito, O., Vaughter, P., Whereat, J., Kanie, N., & Takemoto, K. (2018). *Higher education for sustainable development: Actioning the global goals in policy, curriculum and practice.* Sustainability Science. https://doi.org/10.007/s11625-018-0628-4

Galal, S. (2025). Extreme poverty as share of global population in Africa 2025, by country. https://www.statista.com/statistics/1228553/extreme-poverty-as-share-of-global-population-in-africa-by-....

Global hunger index (2024). Nigeria. https://www.globalhungerindex.org>nigeria

Hardin, R., Bhargava, A., Bothner, C., Browne, K., Kusano, S., Golrokhian, A., Wright, M., ZhuZeng, P., & Agrawal, A. (2016). Towards a revolution in sustainability education: vision, architecture, and

assessment in a case-based approach. *World Development Perspectives, 1,* 58-63. www.elsevier.com/locate/wdp

Howard, P. G. (2018). Twenty-first century learning as a radical re-thinking of education in the service of life. *Education Sciences, 8,* 1-13. www.mdpi.com/journal/education

Igwe, R. O. (2011). *Fundamentals of curriculum and instruction.* Lagos: Vitaman Educational Books. Pg. 3.

Ikuemonisan, E. S. (2024). Challenges and strategies in Nigerian agribusiness entrepreneurship for sustainable development. *Greener Journal of Agricultural Sciences, 14(2)*, 140-152.

IITA (2017). *Synthesis report of the Nigeria zero hunger strategic review*. Ibadan: International Institute of Tropical Agriculture. www.fscluster.org>nigeria>document

Itari, P. E., & Ugbe, T. B. (2018). Education for sustainable development in Nigeria and other developing nations. *British Journal of Education, 6(5),* 41-51. www.eajournals.org/.../Education-for-Sustainable-Development-in-Nigeria-and-Other...

Mghenyi, E., Dankers, C., Thurlow, J. & Anyiro, C. (2022). Transforming agribusiness in Nigeria for inclusive recovery, jobs creation, and poverty reduction: Policy reforms and investment priorities. World Bank Group. https://documents1.worldbank.org>curated>pdf

Michele, M. (2011). *The impact of education across sectors: Food security*. USAID, pg 1-10.

National Business Education Association (2020). *National Standards for Business Education. https://neapolitanlabs.education/assets/north_linn/files/business_education.pdf*

National Universities Commission (2018). *Benchmark minimum academic standards for undergraduate programmes in Nigerian universities.* Abuja: Federal Republic of Nigeria.

Nigeria Bureau of Statistics (2023). *Nigerian labour force survey Q3*. https://www.nigerianstat.gov.ng›elibrary›read

Nwozor, A., & Olanrewaju, J. S. (2020). The ECOWAS agricultural policy and the quest for food security: assessing Nigeria's implementation strategies. *Development Studies Research, 7*(1), 59-71.

Olayemi, H. O., Aderemi, T. A., Ojelade, L. O., & Adebayo, A. G. (2019). The role of agriculture in poverty reduction in Nigeria: An empirical perspective. *International Journal of New Economics and Social Sciences, 1(9)*, 251-262.

Onoja, A., Odumu, A. S., & Moses-Ojo, O. (2024). Food security challenges: An impediment to achieving sustainable development goals (SDG 2). *Gusau Journal of Sociology, 4(2)*, 205-215.

Osman, A., Ladhani, S., Findlater, E., & Mckay, V. (2017). *Curriculum framework for the sustainable development goals (1st Ed.).* Commonwealth Secretariat. https://www.thecommonwealtheducationhub.net/.../Curriculum_Framework_for_SDGs

Overwien, B. (2016). Education for sustainable development and global learning – references to teaching right livelihood. In E. Christoforatou (ed.), *Education in a globalized world* (pp. 40-56). www.researchgate.net>punlication

Oviawe, J. I. & Ehirheme, P. E. (2019). Sprouting sustainable industrial and technological workforce through technical vocational education and training in south-south Nigeria. *Journal of Vocational Education Studies, 2*(2), 113-126.

Patrick, B., Enakshi, S., & Mandla, M. (2018). *Higher education's key role in sustainable development. The global window on higher education.* University World News. https://www.universityworldnews.com/post.php?story=20180905082834986

Pawlak, K., & Kolodziejczak, M. (2020). The role of agriculture in ensuring food security in developing countries: considerations in the context of the problem of sustainable food production. *Sustainability, 12,* 5488. www.mdpi.com/journal/sustainability

Shafie, S. B., Kamis, A., & Ramli, M. F. (2021). Sustainability of fashion apparel toward environmental well-being and sustainable development. *Journal of Vocational Education Studies, 4(1)*, 60-78.

Shittu, J. (2015). *Towards achieving sustainable development for all: Prioritising targets for implementation; which way forward for Nigeria?* Lagos: Center for Public Policy Alternatives. www.cppareserach.org>wp>content>uploads>2015/10

Silvia, A., Salvador, V., & Monica, F. (2018). Implementing the sustainable development goals at university level. *International Journal of Sustainability in Higher Education, 19(3),* 473-497. https://www.researchgate.net/.../322443008_Implementing_the_sustainable_developmen.

Storey, M., Killian, S., & O'Regan, P. (2018). Business education for sustainable development. In W. Leal Fillo (ed.), *Encyclopedia of sustainability in higher education*. https://doi.org/10.1007/978-3-319-63951-2_199-1

Tete, M. F., Limongi, R., de Almeida, M. I. S. & Borges, C. (2014). Experiential learning as teaching strategy for entrepreneurship: assessment of a Brazilian experience. *International Journal of Innovation and Learning, 16(4),* 428-447.

Ugwuogo, C. C. & Udu, C. S. (2016). Achieving sustainable development goals through a sustainable business education programme for changing communities. *Journal of Qualitative Education, 12*(2), 92-97.

Ukata, P. F. Wechie, N. & Nmehielle, E. L. (2017). Instructional strategies and teaching of business education in higher institutions in Rivers State. *International Journal of Education and Evaluation, 3*(9), 20-36. www.iiardpub.org>get>IJEE>INSTRUCTIONAL_STRAT

Umoru, T. A. (2013). Values-based business education for empowerment, self-reliance and poverty reduction in Nigeria. *World Journal of Education, 3*(4), 35-40. www.files.eric.ed.gov>fulltext

United Nations Conference on Trade and Development (2017). *Beyond austerity: Towards a global new deal. Trade and Development Report*. New York and Geneva. www.unctad.org>webflyer>trade-and-d..

UNESCO (2021). *SDG resources for educators – zero hunger –* UNESCO. www.en.unesco.org>sdgs>material

UNESCO (2017). *Education for sustainable development goals: learning objectives.* https://www.developmenteducation.ie/app/uploads/2017/07/Sustainabledevelopment-goals-learning-objectives-2017.pdf

UN World Food Programme (2025). Nigeria. https://www.wfp.org>countries>nigeria

World Vision USA (2024). *Africa hunger crisis: Facts, FAQs, how to help*. https://www.worldvision.org>NewsandStories

INFLUENCE OF ARTIFICIAL INTELLIGENCE (AI) EDUCATIONAL TOOLS ON ACADEMIC EXCELLENCE OF SOCIAL STUDIES UNDERGRADUATE STUDENTS

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Abstract

This study explored how Artificial Intelligence (AI) educational tools influence the academic excellence of Social Studies undergraduate students at Tai Solarin University of Education, Ogun State. The research used a descriptive survey design. The study focused on 100–400 level students in the Department of Sociological Studies. A total of 344 students were selected using a stratified random sampling technique. Out of the 344 questionnaires distributed, 315 were properly filled and returned for analysis. The data collection tool was a researcher-made, close-ended questionnaire titled "Artificial Intelligence Educational Tools and Academic Excellence Questionnaire (AIETAEQ)," with a reliability score of 0.83. Descriptive statistics such as frequency counts, percentages, means, and standard deviation were used to analyze the data. The findings showed that AI tools positively influenced students' academic performance. They helped students improve their grades, complete assignments faster, understand difficult topics better, and become more motivated to study on their own. Students also had a generally positive opinion about using AI tools in their learning process. These results are important because they show that AI has the potential to make learning easier and more effective for students. Based on these findings, the study recommends that universities should invest more in reliable AI tools and ensure all students can access them easily. It also suggests that lecturers should be trained on how to use these tools well and include them in teaching for better learning outcomes.

Keywords: Artificial Intelligence (AI) educational tools, Academic excellence and social Studies Undergraduate

Introduction

As technology and industries continue to grow and change fast, schools and higher institutions must also adjust how they teach, so that students can learn useful and current skills. In business education programs, learning Artificial Intelligence (AI) is very important because it helps students get ready for the modern business world, which is always changing. Still, these programs face several problems that make teaching and learning harder, and this affects how well students are prepared to enter the job market, which is now more competitive than before. AI is used in many areas like schools, hospitals, banks, transport systems, and even entertainment. Some everyday examples include voice assistants like Siri and Alexa, or recommendation tools on Netflix and Amazon that suggest what to watch or buy. Also, self-driving cars are another example of how AI is shaping our lives. There is no doubt that AI has become a big help to people and can be used in many areas, including how schools and universities are managed (Joel *et al.*, 2025). In fact, the use of AI in schools today can improve decision-making, support planning, and help students learn better and faster. That's why having AI knowledge is a big advantage in today's world.

Academic relates to all matters connected with education, especially within formal learning settings like schools, colleges, or universities. It covers the processes, knowledge, and standards involved in both teaching

and learning (Rubas, 2023). Within this educational context, the core aim is to build knowledge, develop skills, and promote deep understanding of concepts. This includes tasks such as delivering instruction, conducting research, producing scholarly articles, and assessing academic achievement. Academia covers a wide range of disciplines, and this approach aims to facilitate intellectual growth and individual development through learning and contributing to the development of knowledge more broadly (Sunaiyah *et al.*, 2022). Academic excellence often serves as the yardstick for success, with grades universally recognized as a clear and conspicuous measure of academic excellence within the educational sphere (Bonday, Wu & Gunderman, 2022). However, academic excellence could be influenced by various factors, technology could be identified as one of the major factors, according to this study. The incorporation of technology into education has brought about significant transformations, revolutionizing conventional teaching and learning approaches. From the introduction of computers to the emergence of Artificial Intelligence (AI), technology has continuously reshaped the educational landscape, offering novel opportunities for both educators and students (DeLuca *et al.*, 2021).

The integration of technology into learning offers a myriad of benefits, enriching the educational experience in diverse ways. Firstly, technology provides access to extensive information and resources via the internet, enabling students to explore subjects beyond the limitations of traditional textbooks and classroom materials. This access to a vast repository of knowledge empowers students to engage in self-directed learning, fostering curiosity and honing critical thinking skills (Coffman, Olson & Bond, 2023). Moreover, technology facilitates interactive and collaborative learning experiences. Educational software, multimedia presentations, and online platforms enable students to interact with course content dynamically, such as through simulations, virtual labs, and interactive quizzes (Shadiev, Yi & Altinay, 2024). Collaborative tools allow students to collaborate with peers and educators in real-time, promoting teamwork and communication skills. Moreover, technology offers personalized learning experiences tailored to individual student needs and learning styles (Vermeulen & Volman, 2024).

Artificial intelligence (AI) is a technical development that has profoundly impacted educational field. The quick advancement of AI-driven solutions creates several prospects for society and the educational field. Artificial intelligence can automate various time-consuming and repetitive jobs in the workplace, boosting efficiency and productivity. Individualized learning options in the classroom benefit students, and teachers can use cutting-edge teaching strategies (Park, 2024). AI has become a potent instrument in this digital age that promises to improve education in various ways. According to Mohideen (2024), artificial intelligence (AI) can revolutionize digital learning, enhance teaching techniques, and affect the direction of digital education. Several departments in educational institutions or the education sector have incorporated artificial intelligence. Artificial Intelligence (AI) plays a pivotal role in revolutionizing education by automating tasks, analyzing data, and providing intelligent insights to enhance teaching and learning processes (Dahal, 2024). Adaptive learning platforms leverage data analytics and AI algorithms to track student progress and adapt instructional content accordingly, providing targeted interventions and remediation where needed; this personalized approach addresses gaps in understanding and ensures that each student receives the necessary support to succeed (Vermeulen & Volman, 2024).

Artificial Intelligence (AI) educational tools are software applications and platforms that use AI technologies—like machine learning, natural language processing, and data analytics—to support teaching and learning processes. These tools are increasingly integrated into higher education settings to enhance students' learning experiences, improve academic outcomes, and personalize education. Some of the most widely used AI educational tools include intelligent tutoring systems (such as Carnegie Learning), AI-powered writing assistants (like Grammarly or Quillbot), personalized learning platforms (like Squirrel AI or Knewton), and AI chatbots or virtual tutors (like ChatGPT). These tools help students understand complex topics, receive instant feedback, and develop critical thinking and writing skills. For example, ChatGPT can assist students with summarizing information, answering questions, generating ideas for assignments, or explaining difficult concepts in simpler terms (Fitria, 2021). Aniella and Gabriel (2025) further noted that AI tools also support teachers in tracking student progress through learning analytics, allowing them to tailor teaching strategies to meet individual student needs. In online learning environments, AI can automatically grade assignments, detect plagiarism, and even predict student performance based on engagement and past results. The influence of these tools on academic excellence is significant. They help reduce learning barriers

by offering 24/7 support, personalized learning paths, and immediate guidance, which enhances students' understanding and motivation. Furthermore, they encourage self-directed learning, which is essential for academic success in undergraduate education. However, while AI tools can enhance learning, their effectiveness depends on how students use them. If used ethically and thoughtfully, AI educational tools have the potential to significantly improve academic performance, foster deeper learning, and make education more accessible and inclusive for all students.

The integration of AI into education aims to optimize learning outcomes, enhance efficiency, and empower educators and students alike (Rizvi, 2023). Artificial Intelligence (AI) can use extensive educational data to identify patterns, trends, and areas for improvement, enabling educators to make data-driven decisions and tailor instructional strategies to meet the diverse needs of students (Tobler, 2024). For students, AI-powered tools offer personalized learning experiences, adaptive feedback, and opportunities for self-directed learning, ultimately enhancing academic excellence. The field of artificial intelligence has led to the emergence of human-like intelligence in computers, machines, and other artefacts. Artificial intelligence (AI) in education significantly influences how the curriculum is designed and how students are engaged (Montgomery, 2024). Artificial intelligence (AI) integration in education has brought dramatic developments in the digital age, changing instructional strategies, curriculum design, and student involvement (Su & Zhong, 2022). In light of the above background, this study therefore intends to investigate the influence of Artificial Intelligence (AI) educational tools on academic excellence of social studies undergraduate students in Tai Solarin University of Education, Ogun state.

Statement of the Problem

Artificial Intelligence (AI) is now widely used in many schools and universities to improve teaching and learning. However, it is still not clear how much these AI tools actually help students perform better academically. This uncertainty creates a problem for teachers, school leaders, and policymakers who are trying to use AI in ways that truly improve learning outcomes. While there are studies on AI in education, most of them do not focus on the academic performance of undergraduate students, especially those studying Social Studies. There is also a gap in research on how AI tools affect things like students' grades, test scores, understanding of difficult topics, and ability to think critically. In addition, many universities have different levels of access to AI technology. Some schools have modern and well-designed AI platforms, while others use older or less effective tools. This uneven access may affect how students benefit from AI in their learning. Furthermore, past research has not paid enough attention to the Nigerian education system, particularly in universities that focus on teacher education, such as Tai Solarin University of Education. Because of these gaps, it is important to carry out this study to examine how AI educational tools influence the academic excellence of Social Studies undergraduate students in Tai Solarin University of Education, Ogun State.

Research Objectives

The general objective of the study is to investigate the influence of Artificial Intelligence (AI) educational tools on academic excellence of social studies undergraduate students in Tai Solarin University of Education, Ogun state. However, the specific objectives of this study are to;

1. examine the influence of Artificial Intelligence (AI) educational tools on improving academic excellence of social studies undergraduate students;
2. assess the perceptions and experiences of social studies undergraduate students regarding the use of Artificial Intelligence (AI) educational tools in their learning process;

Research Questions

The following research questions are raised;

i. What is the influence of Artificial Intelligence (AI) educational tools on improving academic excellence of social studies undergraduate students?

ii. What are the perceptions and experiences of social studies undergraduate students regarding the use of Artificial Intelligence (AI) educational tools in their learning process?

Conceptual Review

Life today is full of stress and complex challenges, which has made people find smart and acceptable ways to live better and solve daily problems. Since humans are seen as the most intelligent animals, they are expected to use their past experiences, sharp thinking, and ability to plan ahead to handle difficult situations. These are all signs of intelligence. Intelligence means being able to learn new things, understand them, and use that knowledge to deal with life situations and make things better for oneself (Barango-Tariah, 2025). In schools, the word "educational assessment" is often used by teachers and school workers. It means the process of checking how well students, teachers, and even non-teaching staff are doing their work. It involves collecting real data and using it to measure how good or poor someone is performing in the school setting (Ogoke *et al.*, 2024). According to Joel *et al.* (2025), educational assessment is any planned effort to gather and study information that will help improve teaching and learning goals. This can be done for one student or for the school as a whole. The definition makes it clear that every school has a set of goals it wants to reach within a particular period. To make sure those goals are achieved, there must be regular assessment. Without proper assessment, schools may not know if they are making progress or falling behind. So, it is important for all schools to assess teaching, learning, and general performance to help meet their aims.

Rodrigo (2023) explains that artificial intelligence (AI) is an area of study focused on building computer systems that can perform tasks normally done by humans. These tasks include things like recognizing voices or faces, playing games like chess, or even navigating traffic while driving. When used in education, AI is often called Artificial Intelligence in Education (AIED), which refers to the use of AI tools to improve how teaching and learning take place. AIED can also impact how people think and how their brains develop. Since the days of Socrates, who believed writing could weaken memory, people have questioned how technology influences human growth and intelligence. Today, AI is part of everyday life—ranging from smart parking tools and advanced camera sensors to digital assistants that help with daily tasks.

Likewise, education is experiencing changes due to the growing use of AI, and the traditional ways of teaching are being transformed. Although we may not see robot teachers soon, there are already several AI projects helping students and educators have better learning experiences. According to Frankenfield and Scott (2020), AI and Machine Learning have the potential to raise the quality of education. The use of AI in educational settings has been expanding in recent years, gaining much attention. AI is now being used in skill-building apps and systems that assist with testing and assessments. As these AI tools continue to develop, they are expected to help close the learning gaps in classrooms and enable teachers and schools to achieve more. Education is becoming easier and more personalized due to the many ways AI is being used in learning. This has changed the way people learn, as smart devices and computers now provide wider access to educational resources. Since students today will be working in a future shaped by AI, it is essential that schools teach them how to use these technologies and make them part of the learning process (Hargrave, 2019).

Social Studies education combines knowledge from many areas to help students develop useful values, attitudes, skills, and knowledge that will help them function well in society. It plays a key role in preparing young people to be active and responsible citizens. Social Studies was introduced into Nigeria's school curriculum to help children become disciplined, adaptable individuals who can contribute positively to their communities. The subject encourages good behavior and teaches students how to respond to societal changes. As a subject based on solving problems and understanding culture, Social Studies also supports peace, security, and long-term development. Through Social Studies, students are guided to become responsible members of society. According to Osakwe (1993), as cited by Omoniyi (2023), Social Studies can be used to bring positive change in society.

Despite its potential, Social Studies has not been fully explored in the drive for social, political, and economic improvement. It helps young people gain hope for the future and develop the confidence needed to deal with personal and national social problems. The subject uses a spiral method to study issues and focuses mainly on relationships among people. Because the world is always changing, Social Studies is a useful tool for helping people understand and respond to both good and bad changes. It uses unique teaching methods such as discussions, projects, and problem-solving activities to help students think critically and assess different

situations wisely. Since it focuses on human interactions, Social Studies helps people make informed choices that affect how they relate with others (Omoniyi, 2023).

Empirical Review

Salido (2023) investigated the impact of educational tools powered by artificial intelligence, such as smart tutoring programs and digital learning platforms, on how well students perform academically and understand their lessons. The study found that AI can greatly transform the education sector by helping to tailor learning to each student's needs, which in turn improves both academic success and understanding. However, the study also noted the importance of considering possible ethical issues and the challenges linked to limited infrastructure. In a related study, Inmaculada, Jose, Jose, and Samuel (2023) explored, using both statistical and descriptive methods, how AI tools and computer-based systems affect student achievement. Their findings revealed that AI and computer science had a positive influence on students' academic outcomes, with improved interest in learning and greater motivation—especially in Science, Technology, Engineering, and Mathematics (STEM) subjects. Nonetheless, the authors stressed that integrating such technologies in education brings many challenges, especially for teachers who must consider both ethical concerns and practical design, pointing to the need for further study in this area.

Altememy, Mohammed, Hsony, Hassan, Mazhair, Dawood, Jouani, Zearah, and Sharif (2023) looked into how AI features affect university students' academic performance in Iraqi institutions. The study showed that Artificial Intelligence-Based Teaching and Assessment (AIBTA) had a meaningful effect on students' performance. There was also a clear and positive link between the use of AI in Iraqi universities and students' academic success. Their findings further highlighted how AIBTA plays a key role in connecting the use of AI in education with the students' academic outcomes, showing its importance as a middle factor in improving student results. In a similar study, Peras, Aviluna, Barbadillo, Canoy, Eslet, Espafiola, Miras, and Nepangue (2023) explored how AI use relates to the academic results of Bachelor of Physical Education (BPEd) students. Their study found that most students saw AI as helpful in boosting academic achievement, and that there was a strong positive relationship between AI use and higher performance. Students who actively used AI tools tended to perform better, leading the researchers to recommend that schools and teachers include AI more in their teaching methods to raise student performance and involvement.

Lastly, Ridwal, Indah, Susi, Adam, Romi, Annisaul, David, and Nazliati (2023) studied how Artificial Intelligence affects the academic performance of senior secondary school students. Their research showed that AI plays a helpful role in assisting teachers to develop high-performing students, especially at the high school level. They concluded that AI technology supports both teaching and learning by helping teachers reach instructional goals and by helping students improve in their studies. This proves that AI can be a valuable tool in improving academic excellence when properly applied in the school environment.

Methodology

This study used a descriptive survey research design to examine the influence of Artificial Intelligence (AI) educational tools on academic excellence. The study population included all Social Studies undergraduate students in 100 to 400 levels in the Department of Sociological Studies, Tai Solarin University of Education, Ijagun, Ogun State. The total population was 1,720 students. A stratified random sampling technique was chosen because it allowed fair and balanced representation from each level (100, 200, 300, and 400 level). This method helped ensure that the sample reflected the differences across class levels. From each level, 20% of the students were randomly selected, giving a total sample size of 344 respondents. Out of the 344 questionnaires distributed, 315 were properly filled and returned, and these were used for data analysis. The data collection instrument was a self-developed, close-ended questionnaire titled "Artificial Intelligence Educational Tools and Academic Excellence Questionnaire (AIETAEQ)." The questionnaire was validated by experts in Educational Technology and Social Studies Education to ensure that the questions matched the objectives of the study (face and content validity). To check reliability, a pilot test was conducted using 30 Social Studies undergraduate students from a nearby university who were not part of the main study. Based on their feedback, some questions were revised for better clarity and understanding. The final version of the instrument was then tested for internal consistency using Cronbach's Alpha, and a reliability coefficient of

0.83 was obtained, showing that the questionnaire was highly reliable. The data collected were analyzed using descriptive statistics such as frequency counts, percentages, mean scores, and standard deviation to answer the research questions.

Results

RQ1: What is the influence of Artificial Intelligence (AI) educational tools on improving academic excellence of students?

Table 1: Descriptive Analysis of Research Question One: Influence of AI Educational Tools on Academic Excellence

S/N	Items	SA (Freq. %)	A (Freq. %)	N (Freq. %)	D (Freq. %)	SD (Freq. %)	Mean	Std. Dev.
1	AI educational tools have helped me become more efficient in completing my assignments.	99 (31.4%)	104 (33.0%)	53 (16.8%)	38 (12.1%)	21 (6.7%)	3.71	1.10
2	I have noticed an improvement in my grades since I started using AI educational tools.	86 (27.3%)	108 (34.3%)	60 (19.0%)	42 (13.3%)	19 (6.0%)	3.64	1.09
3	AI educational tools have helped me understand difficult concepts.	90 (28.6%)	97 (30.8%)	64 (20.3%)	44 (14.0%)	20 (6.3%)	3.61	1.11
4	AI teaching assistants in virtual classrooms have improved the overall quality of my online education.	77 (24.4%)	112 (35.6%)	72 (22.9%)	36 (11.4%)	18 (5.7%)	3.62	1.07
5	AI educational tools have motivated me to study more independently.	82 (26.0%)	95 (30.2%)	71 (22.6%)	43 (13.7%)	24 (7.6%)	3.54	1.14
	Average Mean						**3.62**	**1.10**

Table 1 presents the descriptive analysis of students' perceptions of AI educational tools in enhancing academic excellence. The highest mean score (3.71) is associated with the statement that AI educational tools enhance efficiency in completing assignments, indicating strong agreement among respondents. The statement that AI educational tools have improved students' grades has a mean score of 3.64, suggesting a notable positive impact on academic performance. Similarly, the statement that AI tools help in understanding difficult concepts has a mean of 3.61, further emphasizing their usefulness in learning. The statement that AI teaching assistants enhance online education holds a mean of 3.62, reflecting the perceived benefits of AI in virtual learning environments. The lowest mean score of 3.54 relates to AI motivating students to study independently, though it still indicates moderate agreement. Hence, the average mean of 3.62 indicated that students generally perceive AI educational tools as beneficial in fostering academic excellence. The standard deviation of 1.10 indicates a moderate level of consistency in responses. Thus, it can be inferred that AI educational tools positively influence students' academic performance by enhancing efficiency, comprehension, online learning quality, and motivation for independent study.

RQ2: What are the perceptions and experiences of social studies undergraduate students regarding the use of Artificial Intelligence (AI) educational tools in their learning process?

Table 2: Descriptive Analysis of Research Question Two: Perceptions and experiences of AI educational tools

S/N	Items	SA (Freq. %)	A (Freq. %)	N (Freq. %)	D (Freq. %)	SD (Freq. %)	Mean	Std. Dev.
1	AI educational tools are a valuable addition to the future of education.	136 (43.2%)	107 (34.0%)	43 (13.7%)	20 (6.3%)	9 (2.9%)	4.08	1.07
2	AI educational tools help to improve my problem-solving skills.	124 (39.4%)	109 (34.7%)	41 (13.0%)	25 (7.9%)	16 (5.1%)	3.95	1.13
3	AI educational tools are more engaging compared to traditional methods.	126 (40.0%)	101 (32.1%)	44 (14.0%)	28 (8.9%)	16 (5.1%)	3.93	1.12
4	AI educational tools are easy to use.	119 (37.8%)	112 (35.6%)	45 (14.3%)	27 (8.6%)	12 (3.8%)	3.94	1.10
5	AI educational tools make learning more personalized and tailored.	115 (36.5%)	98 (31.1%)	52 (16.5%)	35 (11.1%)	15 (4.8%)	3.84	1.19
	Average Mean						**3.95**	**1.12**

Table 2 presents the descriptive analysis of social studies undergraduate students' perceptions and experiences regarding AI educational tools. The highest mean score (4.08) corresponds to the statement that AI educational tools are a valuable addition to the future of education, suggesting strong agreement among respondents on AI's importance in education. The statement that AI improves problem-solving skills follows closely with a mean score of 3.95, indicating that students recognize AI's contribution to cognitive skill development. Similarly, the perception that AI tools are more engaging than traditional method has a mean of 3.93, reflecting a positive shift towards AI-driven learning. The statement that AI educational tools are easy to use also holds a mean score of 3.94, showing general agreement on usability. Meanwhile, the lowest mean score of 3.84 is linked to the personalization of AI tools in learning, which still falls within a favorable range. The overall average mean of 3.95 suggests that students have a positive perception and experience with AI educational tools, with general agreement on their usefulness, ease of use, engagement, and contribution to problem-solving. The standard deviation of 1.12 indicates a moderate level of consistency in responses. Hence, it can be inferred that AI educational tools are well-received among social studies undergraduates, offering promising support for improved learning experiences.

Discussion of Findings

The study showed that there is a positive influence of AI tools on aspects such as grade improvement, assignment efficiency, comprehension of difficult concepts, and motivation for independent study. This aligns with findings by Salido (2023), who highlighted the role of AI-driven educational resources, like intelligent tutoring systems, in enhancing student academic performance and comprehension. Similarly, Peras *et al.* (2023) noted that students engaging with AI tools exhibit higher academic success and motivation, particularly in physically demanding fields. The present study corroborates Altememy *et al.* (2023), who emphasized that AI capabilities substantially impact student performance through AI-based teaching and assessment. These studies reinforce the assertion that AI enhances personalized learning experiences, improving academic outcomes and student motivation. Additionally, Inmaculada *et al.* (2023) found AI tools positively impact STEM education by boosting students' attitudes towards learning and promoting deeper comprehension of complex subjects. The study showed that there is a positive perception of AI educational tools among social studies undergraduate students, which also implies that AI tools enhance engagement, personalize learning, and contribute to future educational advancements, while also being easy to use and helpful in developing problem-solving skills. This finding is consistent with Zouhaier's (2023) research, which demonstrated that AI tools revolutionize education by personalizing teaching methods and fostering student engagement. Bancoro (2024) also noted that AI tools enhance students' learning experiences through personalized learning and collaborative activities, significantly improving academic performance and problem-solving skills. Similarly, Hussain *et al.* (2022) observed that AI systems, like intelligent computer-assisted instruction, enhance learning quality and facilitate student-initiated learning, aligning with the positive perceptions of the students in the current study. Moreover, Kyoungwon *et al.* (2021) found that AI

tools improve learner-instructor interactions by providing personalized support and enhancing communication.

Conclusion

From the study, it is evident that AI educational tools have a strong positive influence on the academic performance of Social Studies undergraduate students. These tools help students achieve better grades, complete assignments more efficiently, understand difficult topics, and become more motivated to study on their own. The students also had a positive view of these tools, which shows that AI can make learning more engaging and personalized. More importantly, this study shows that AI tools are not just helpful for day-to-day learning—they also have the potential to change how education is delivered and experienced in universities. By improving how students learn and engage with content, AI tools can help prepare learners for future demands in education and the workplace. This research contributes to the growing knowledge about the role of AI in Nigerian universities, especially in teacher training institutions. It highlights the need for universities to invest in modern AI tools, train lecturers on how to use them effectively, and ensure that all students have equal access. When these conditions are met, AI tools can play a powerful role in improving the quality of education and boosting academic success in the Social Studies classroom and beyond.

Recommendations

In view of the findings of this study, it is therefore recommended that:

1. Universities should invest in high-quality AI educational tools and ensure that all students have reliable access to the necessary technology and internet.
2. Faculty members should integrate AI tools into the curriculum by providing training on effective usage and best practices.
3. Educational policymakers should develop policies that promote equitable access to AI educational resources across all educational institutions.
4. University IT support staff should establish robust technical support systems to assist students and faculty in navigating AI tools effectively.
5. Regular training sessions should be conducted to familiarize users with updates and new features of these technologies.
6. Undergraduate students should foster a proactive attitude towards the use of AI educational tools by actively seeking to incorporate them into their study routines.
7. Students should also provide feedback on their experiences to help institutions continuously improve the integration of these technologies.

References

Altememy, H. A., Mohammed, B. A., Hsony, M. K., Hassan, A. Y., Mazhair, R., Dawood, I. I., Jouani, H. A., Zearah, S. A., & Sharif, H. R. (2023). The influence of the artificial intelligence capabilities of higher education institutions in Iraq on students' academic performance: The role of AI-based technology application as a mediator. *Eurasian Journal of Educational Research, 104*, 267-282.

Aniella, M. V., & Gabriel, P. (2025). The impact of Artificial Intelligence (AI) on students' academic development. *Education sciences, 15*(3), 343.

Barango-Tariah, H. (2025). Application of Artificial Intelligence (AI) in education and educational assessment. *International Journal of Educational Management, Rivers State University, 1*(2), 30-43.

Bonday, R., Wu, I., & Gunderman, R. B. (2022). Numbers in educational excellence. *Academic Radiology, 29*(5), 786–787.

Coffman, P., Olson, Z., & Bond, J. (2023). High-quality DIY educational video: Supporting faculty and engaging learners. *About Campus: Enriching the Student Learning Experience, 28*(4), 28–35.

Dahal, C. (2024). Revolutionizing education through AI-powered inclusive learning systems. *Proceedings of the AAAI Conference on Artificial Intelligence, 38*(21), 23736–23737.

DeLuca, C., Searle, M., Carbone, K., Ge, J., & LaPointe-McEwan, D. (2021). Toward a pedagogy for slow and significant learning about assessment in teacher education. *Teaching and Teacher Education, 101*, 103316. https://doi.org/10.1016/j.tate.2021.103316

Fitria, T. N. (2021). Artificial Intelligence (AI) in education: Using AI tools for teaching and learning process. *Proceeding Seminar Nasional & Call For Papers, 20*, 134-147.

Inmaculada, G., Jose, M., Jose, F., & Samuel, P. (2023). Analysing the impact of artificial intelligence and computational sciences on student performance: Systematic review and meta-analysis. *Journal of New Approaches in Educational Research, 12*(1), 171-197.

Joel, G. Y., Egbunefu, C., & Onyemaechi, O. T. (2025). Application of Artificial Intelligence in business education programme for enhanced learning capabilities of Postgraduate Students in Rivers State Universities. *World Journal of Innovation and Modern Technology, 9*(1), 44-67.

Mohideen, H. L. (2024). Exploring the opportunities of implementing artificial intelligence (AI) technology for teaching Arabic to non-native speakers: A theoretical approach. *Journal of Digital Learning and Distance Education, 2*(10), 760–767.

Montgomery, R. M. (2024). Enhancing neuroprosthetic control through AI-powered adaptive learning: A simulation study. *Wired Neuroscience, 1*(5), 1–22.

Ogoke, C. J., Anyanwu, A., Okolie, A., Onuoha, E., & Vivian, D. (2024). Application of artificial intelligence in the teaching and learning of mathematics: Implication for achievement and retention. *Eureka: Journal of Educational Research, 3*(2), 136-143.

Omoniyi, M. E. (2023). Social studies education: A veritable tool for achieving value re-orientation and sustainable development in Nigeria. *International Journal of Learning and Development, 13*(2), 59-69.

Park, J. (2024). Appeared in AI educational books for lower grades AI content element analysis and critical review. *The Korean Society for Artificial Intelligence Ethics, 3*(1), 9–23.

Peras, B., Aviluna, M., Barbadillo, A., Canoy, T., Eslet, R., Espafiola, O., Miras, R., & Nepangue, J. (2023). Artificial intelligence as a tool in increasing academic performance. *International Journal of Advanced Multidisciplinary Research and Studies, 3*(6), 1151-1155.

Ridwal, T., Indah, A., Susi, H., Adam, M., Romi, M., Annisaul, K., David, D., & Nazliati, N. (2023). The effect of artificial intelligence in improving student achievement in high schools. *Advances in Social Science, Education and Humanities Research, 789*, 546-557.

Rizvi, M. (2023). Investigating AI-powered tutoring systems that adapt to individual student needs, providing personalized guidance and assessments. *The Eurasia Proceedings of Educational and Social Sciences, 31*, 67–73.

Rubas, J. (2023). College academic performance in science-related programs and senior high school strands: A basis for higher education admission policy. *Education Mind.* https://doi.org/10.58583/pedapub.em2303

Salido, V. (2023). Impact of AI-powered learning tools on student understanding and academic performance. *BAPS 85: Introduction to Political Analysis and Research, 2*, 1-10.

Shadiev, R., Yi, S., & Altinay, F. (2024). Cultivating self-directed learning abilities in K-12 students through immersive online virtual tours. *Interactive Learning Environments*, 1–26. https://doi.org/10.1080/10494820.2024.2312923

Su, J., & Zhong, Y. (2022). Artificial intelligence (AI) in early childhood education: Curriculum design and future directions. *Computers and Education: Artificial Intelligence, 3*, 100072.

Sunaiyah, S., Siswanto, W., Dermawan, T., & Hasanah, M. (2022). Student academic writing knowledge and skills or student academic writing competence in Indonesia. *NeuroQuantology, 20*(2), 240–266.

Tobler, S. (2024). Smart grading: A generative AI-based tool for knowledge-grounded answer evaluation in educational assessments. *MethodsX, 12*, 102531. https://doi.org/10.1016/j.mex.2023.102531

Vermeulen, E. J., & Volman, M. L. L. (2024). Promoting student engagement in online education: Online learning experiences of Dutch university students. *Technology, Knowledge and Learning.* https://doi.org/10.1007/s10758-023-09704-3

FROM ANXIETY TO SELF-EFFICACY: TEACHERS TRAITS AND SCHOOL CLIMATE ON MATHEMATICS CONFIDENCE AMONG JUNIOR SECONDARY SCHOOL STUDENTS IN LAGOS STATE, NIGERIA

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Abstract
This study investigated the predicting strengths of self-efficacy, anxiety, teachers' traits and school climate on mathematics confidence of secondary students in Lagos State. The study employed descriptive survey research design with samples of 300 hundred Junior Secondary School students using simple random sampling technique of hat and draw method to select both the schools and students in District IV in Lagos State. Mathematics anxiety scale, Mathematics Confidence, Mathematics self-efficacy scale, School Climate Scale and Teacher Traits Questionnaire with reliabilities of 0.69, 0.72, 0.66, 0.79 and 0.77 respectively were the instruments used to collect data. Data collected was analysed using Pearson Product Moment Correlation and Multiple Regression. The results revealed that all the independent variables (mathematics anxiety, mathematics self-efficacy, school climate and teachers' traits) jointly predicted dependent variable (mathematics confidence). Also, the findings revealed that mathematics anxiety and self-efficacy contributed mostly to mathematics confidence of Junior secondary school in Lagos State
Keywords: Mathematics anxiety, Mathematics confidence Mathematics self-efficacy, School climate, Teachers traits

Introduction

Achieving competence in any subject area is a mark of mastery and indicator of confidence in attaining excellent academic achievement which we mostly regarded as academic success. Academic success is linked to so many mediators among them is the nature of the subject. Mathematics from time immemorial has been considered difficult and feared by many students. This might not be unconnected with perception and successive historical believe by students who ordinarily could have developed interest but based on their conclusion in what others perceived the subject. Mathematics is a living subject and has its applications in all areas of human life and endeavors. Primarily, this subject should be the centre point of man operation and loved by everyone. Unfortunately, findings have revealed that most secondary school students performed below the expected academic expectation owing to a number of factors ranging from interest, anxiety, self-efficacy, poor motivation which singly and or collectively may be responsible.

Demonstrating confidence in Mathematics by students may be dependent on both external and internal of students. The internal factors are self- induced and largely dependent on the ability to be efficacious while the external factors are environmental dependent. Among self-induced factors are anxiety, self-esteem, self-concept and host of others. These factors may likely make students to shy away from class responsibilities during class activities. Other environmental that factors may range from school environment cum school climate, teachers' methodology and personality.

Studies have been carried out in the area of mathematics anxiety and a number of studies have reported that mathematics anxiety negatively impacted on learners' achievement. (Ashcraft & Moore, 2009; Beilock at al., 2010; Lindskog, et al., 2017). Anxious about Mathematics hinders the students' ability to conceptualize, inquire, reason and solve Mathematics problem which can later create a vacuum in some life activities apart from academics (Mollah, 2017). Mathematics anxiety is psychological and it interferes with students' ability to think and cope with figures that involve mathematics. This anxiety does not mean that such student does not have the ability to solve mathematics problems but phobia to do anything that involve figures or calculation. It is a major concern and may adversely affect achievement at later life. The anxiety in mathematics may further exacerbate some other psychological related problem such as self-efficacy. Self-efficacy is an important concept in social cognitive theory, which has been widely recognized as one of the most prominent theory about human learning (Ormrod, 2008). Self-efficacy refers to an individual's belief

in their capacity to execute behaviors necessary to produce specific performance outcomes. This construct is highly important for life achievement. Mathematics self-efficacy is closely associated with students' mathematics achievement. Self-efficacy refers to an individual's beliefs in their capacities to execute courses of action to accomplish and succeed in given tasks (Bandura, 1977). It has been established that students self-efficacy is associated with individual ability to set goal (Schunk & DiBenedetto, 2021) and also school where students belong (Bandura, 2001). Studies have also demonstrated correlation between mathematics self-efficacy and achievement (Yang, et al., 2024). Hence, the importance of self-efficacy on life achievement cannot be over-emphasised. This is because, without confidence and a strong belief in one's ability to perform specific tasks or make informed decisions, achieving success in life may prove challenging. Therefore, students must develop strong confidence to achieve a life purpose.

Furthermore, school environment which comprise school climate can also play significant role in students' school adjustment and adjustment can affect achievement in any school subject. Cosner et. al., (2005) defined school climate as 'the set of internal characteristics that distinguish one school from another and influence the behaviors of each school's members. For instance Wang and Eccles (2012) conducted a longitudinal study to examine the relationship between school climate and academic achievement among middle school students. The study sampled participants from a single large county near Washington, D.C. Their findings revealed a positive correlation between students' perceptions of a supportive school climate characterized by caring relationships, high academic expectations, and a strong sense of belonging and their academic engagement and performance over time. In a related study, a meta-analysis of the empirical data on the connection between student academic achievement and school atmosphere carried out by (Thapa et al. (2013). The result revealed strong correlation between students' academic performance in a variety of grade levels and learning environments and favorable aspects of the school atmosphere, such as safety, supportive connections, and high expectations. Hence, school climate could be a strong predictor of mathematics self-confidence among secondary school students.

In addition, Teachers trait or characteristics have been considered major as one of the major influence of students' personality and achievement. Teachers' traits are the qualities that foster positive classroom culture, encourage exploration, and help every learner feel seen and supported. Bhai and Horoi (2019) noted that teacher quality can shape how a student's peers learn and behave in a classroom. It can then be inferred that teachers can predict academic excellence and deficit of students. A warm, accommodating and temperate teacher will produce a better achieved student. On the other hand, a teacher that possesses opposite traits to what have been mentioned earlier may produce poorly achieved students. Hence showing confidence in any school subjects may be influenced by the personality or traits of teachers. Experimental studies have used data from L.A. unified school district (Kane & Staiger, 2008) and Project STAR (Wood et. al, 1990; Krueger 2003; Chetty, Friedman, & Rockoff 2014), the findings from L.A. show that teacher quality, notably, experience did raise achievement and in the same vein project STAR demonstrated that teachers quality affect students' performance. With myriad of evidences indicating that anxiety, self-efficacy and school climate may influence students' performance, it becomes neceaary to find out whether these factors will individually and or jointly influence students mathematics confidence. Therefore, this study investigated the predicting strength of self-efficacy, anxiety, teachers' traits and school climate on mathematics confidence of secondary students in Lagos State.

Research hypotheses

1. Anxiety, self-efficacy, teachers' traits, and school climate collectively have no significant predictive effect on mathematics confidence among junior secondary school students in Lagos State, Nigeria.
2. Self-efficacy, teachers' traits, and school climate individually has no significant predictive influence on mathematics confidence among junior secondary school students in Lagos State, Nigeria

Methodology

This study employed descriptive survey research design. The population for the study comprised Junior Secondary School students in Lagos State between 13 and 19 years. We employed simple random sampling to select secondary school in Educational District IV in Lagos State. A total of 300 junior secondary schools were selected through simple random sampling technique using hat and draw method. Students selected according to the schools are as follows: School A is 53, School B is 47, School C is 45, School D is 55, School E is 50 and School F is 50. The instruments for data collection were Mathematics anxiety scale

(adapted from mathematical anxiety scale instrument for junior high school students by Supahar, 2019), Mathematics Confidence Scale (mathematics confidence scale by Hendy, et al., 2014), Mathematics self-efficacy scale (mathematics self-efficacy and anxiety questionnaire by May, 2009), School Climate Scale (classroom climate questionnaire by Fernández-Río et a., 2019), and Teacher Traits Questionnaire (researcher constructed), All the scales were constructed in 4 likert forms. The adapted and self-constructed scales were validated and the following reliability coefficients were derived: mathematics anxiety, 0.69, mathematics confidence scale, 0.72, mathematics self-efficacy scale, 0.66, school climate scale, 0.79, and teachers trait, 0.77 respectively. The data were using simple percentages, Pearson Product Moment Correlation and Multiple regressions

Results

Research hypothesis 1: Anxiety, self-efficacy, teachers' traits, and school climate collectively have no significant predictive effect on mathematics confidence among junior secondary school students in Southwest Nigeria.

Table 1

Model Summary

Model	R	R Square	Adjusted R Square
1	0.549[a]	0.301	0.292

a. Predictors: (Constant), Teacher's Traits, Mathematics Anxiety, School Climate, Self-Efficacy

The multiple regression analysis presented in Table 1 indicates that the four independent variables- teacher's traits, mathematics anxiety, school climate, self-efficacy-together produce a multiple correlation coefficient (R) of 0.549. With a coefficient of determination (R^2) of 0.301, these predictors collectively explain less than 29% of the variance in students' mathematics confidence.

Table 2

ANOVA Result

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2534.754	4	633.689	31.904	0.000[b]
	Residual	5879.246	296	19.882		
	Total	8414.000	300			

a. Dependent Variable: Mathematics Confidence

b. Predictors: (Constant), Teacher's Traits, Mathematics Anxiety, School Climate, Self-Efficacy

Table 2 presents an F-value of 31.904, which is statistically significant and represents the combined effect of teacher's traits, mathematics anxiety, school climate, self-efficacy on students' mathematics confidence. Since this F-value is below the critical threshold of 3.09 ($df = 4/296$, $\alpha = 0.05$), the null hypothesis is rejected. This indicates that there is significant joint influence of teacher's traits, mathematics anxiety, school climate, self-efficacy on students' mathematics confidence.

Research hypothesis 2: Self-efficacy, teachers' traits, and school climate individually has no significant predictive influence on mathematics confidence among junior secondary school students in Lagos State, Nigeria.

Table 3
Relative Effect on Mathematics Confidence

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	10.906	2.577		4.232	0.000
	Mathematics Anxiety	0.169	0.047	0.193	3.571	0.000
	Self-Efficacy	0.444	0.058	0.424	7.675	0.000
	School Climate	0.012	0.042	0.016	0.292	0.771
	Teacher's Traits	0.030	0.052	0.031	0.577	0.564

a. Dependent Variable: Mathematics Confidence

The regression analysis in Table 3 reveals that mathematics anxiety ($\beta = 0.169$, $p < .05$) and self-efficacy ($\beta = 0.444$, $p < .05$) on mathematics confidence significantly contributes to explaining students' mathematics confidence. Furthermore, both anxiety and self-efficacy associated with students' mathematics confidence.

Discussion

The findings revealed that the joint influence of all independent variables i.e. mathematics self-efficacy, anxiety, school climate and teachers' traits on mathematics confidence among junior secondary schools in Lagos State. This joint prediction demonstrated the extent to which some personal and environmental constructs could influence the level of performance of students in school setting especially those subjects termed as difficult. Mathematics is one of the core subjects and students' conception of the subject is that only few individual can be good at it thereby making many students to be less confident and having excellent performance in the subject. The finding is line with Mollah, (2017) who submitted that anxiousness can hinder confidence and better achievement, Schunk and DiBenedetto (2021) that established that students self-efficacy is associated with individual ability to set goal and inability to be efficacious about a task will definitely hinder performance and achievement in such task. The results further corroborated the study carried out by Thapa et al. (2013) on meta- analysis of the empirical data on the connection between student academic achievement and school atmosphere and found that there was strong correlation between students' academic performance in a variety of grade levels and learning environments and favorable aspects of the school atmosphere, such as safety, supportive connections, and high expectations. This finding is a strong indication that school climate can either create confidence or lack of confidence in students which can stem out school adjustment problems. Hence, school climate must be made conducive in order to strengthen mathematics confidence among students. In addition, studies have also revealed that teachers traits in form of quality, qualification and personality can equally affect the achievement of students thereby resulting in lack confidence in school subjects especially mathematics (Bhai & Horoi, 2019; Chetty, Friedman, & Rockoff, 2013; Kane & Staiger, 2008; Krueger, 2003; Wood et. al., 1990).

In addition the findings further revealed that mathematics anxiety and self-efficacy on mathematics confidence significantly contributes to explaining students' mathematics confidence. The predicting strengths of mathematics' self-efficacy and anxiety revealed the level at which these two psychological constructs can adversely influence students dispositions and achievement of tasks. The results lend credence to the fact that students' self-efficacy can affect academic achievement as revealed in studies by (Yang, Maeda & Gentry, 2024) who found association between students' self-efficacy and academic achievement and ability to set goal by students as revealed in a research by (Schunk & DiBenedetto, 2021). The implication of this in classroom environment especially during mathematics lesson is that teachers should help students to develop strong will for achievement and not to create fear that eventually and negatively affect their confidence. Also, the strong relationship between mathematics anxiety and mathematics confidence of students revealed that anxiety does not in any way bring about positive influence on achievement of students rather it diminishes the confidence in performing tasks. The finding corroborated the study carried out by Lindskog, Winman, and Poom (2017) on association between anxiety and students' achievement. It was reported that anxiety negatively affects the ability to effectively accomplish a task. This then bring to bear that mathematics teachers should as much as possible reduce the level of anxiety by employing flexible and innovative pedagogies that will courageously help students to develop interest in the subject

Conclusion

This study investigated the predicting strength of self-efficacy, anxiety, teachers' traits and school climate on mathematics confidence of secondary students in Lagos State. The outcome revealed that all the independent variables i.e. mathematics self-efficacy, anxiety, school climate and teachers' traits jointly predicted mathematics confidence. Also, reveals that mathematics anxiety and self-efficacy contributed significantly to mathematics confidence among junior secondary school students in Lagos State. Hence, the power of self-efficacy, anxiety, school climate and teachers traits cannot be over-emphasised when we want to build confidence in achieving a task in students especially in core subjects like mathematics

Recommendation

Mathematics teachers should strive to help students to build in confidence and reduce anxiety during mathematics lesson by being flexible in pedagogy and innovative in dissemination of mathematics concepts. Parents must also create enabling environment to build self-confidence in their children which will in turn promote self-efficacy and ability to set goal and take rational decisions. Teachers especially mathematics teachers should be accommodating and temperate in relating with students so as have sense of belong and ability to develop self-confidence both in school subjects and some other aspect of life.

References

Ashcraft, M. H., & Moore, A. M. (2009). Mathematics Anxiety and the Affective Drop in Performance. *Journal of Psychoeducational Assessment, 27*(3), 197-205. https://doi.org/10.1177/0734282908330580

Bandura, A. (1977). Self-efficacy: toward a unifying theory of behavioral change. *Psychological review, 84*(2), 191.

Bandura, A. (1997). *Self – efficacy: The exercise of control*. Freeman.

Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual review of psychology, 52*(1), 1-26.

Beilock, S. L., Gunderson, E. A., Ramirez, G., & Levine, S. C. (2010). Female teachers' math anxiety affects girls' math achievement. *Proceedings of the National Academy of Sciences, 107*(5), 1860-1863. https://doi.org/10.1073/pnas.0910967107

Bhai, M., & Horoi, I. (2019). Teacher characteristics and academic achievement. *Applied Economics, 51*(44), 4781-4799**.**

Chetty, R., Friedman, J. N., & Rockoff, J. E. (2014). Measuring the impacts of teachers II: Teacher value-added and student outcomes in adulthood. *American economic review, 104*(9), 2633-2679.

Cosner, S., Hoy, W., & Miskel, C. (2005). Toward a human capital development strategy. *Educational Leadership and Reform*, 233-63.

Fernández-Río, J., Cecchini, J. A., Merino-Barrero, J. A., & Valero-Valenzuela, A. (2019). Percieved classroom responsibility climate questionnaire: A new scale. *Psicothema, 31* (4), 475-481. doi: 10.7334/psicothema2019.76

Hendy, H. M., Schorschinsky, N., & Wade, B. (2014). *Math Confidence Scale*. doi: http://dx.doi.org/10.1037/t38161-000

Kane, T. J., & Staiger, D. O. (2008). *Estimating teacher impacts on student achievement: An experimental evaluation* (No. w14607). National Bureau of Economic Research.

Krueger, A. B. (2003). Economic considerations and class size. *The economic journal, 113*(485), F34-F63.

Lindskog, M., Winman, A., & Poom, L. (2017). Individual differences in nonverbal number skills predict math anxiety. *Cognition, 159*(1), 156-162. https://doi.org/10.1016/j.cognition.2016.11.014

May, D. K. (2004). Mathematics self-efficacy and anxiety questionnaire. (Unpublished Ph.D Thesis) University of Goeorgia.

Mcdevitt, T. M., & Ormrod, J. E. (2008). Fostering conceptual change about child development in prospective teachers and other college students. *Child Development Perspectives, 2*(2), 85-91.

Mollah, K. (2017). Mathematics anxiety among school students. *Pramana Research Journal, 7* (11), 122-129

Schunk, D. H., & DiBenedetto, M. K. (2021). *Self-efficacy and human motivation. In Advances in motivation science* (Vol. 8, pp. 153-179). Elsevier.

Thapa, A., Cohen, J., Guffey, S., & Higgins-D'Alessandro, A. (2013). A review of school climate research. *Review of educational research, 83*(3), 357-385.

Wang, M. T., & Eccles, J. S. (2012). Adolescent behavioral, emotional, and cognitive engagement trajectories in school and their differential relations to educational success. *Journal of research on adolescence, 22*(1), 31-39.

Wood, J. V., Saltzberg, J. A., & Goldsamt, L. A. (1990). Does affect induce self-focused attention?. *Journal of personality and social psychology, 58*(5), 899.

Yang, Y., Maeda, Y., & Gentry, M. (2024). The relationship between mathematics self-efficacy and achievement : multilevel analysis with NAEP 2019. *Large –Scale Assessment in Education 12*(16), 1-29