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The Vocational and Applied Science Journal (VAS)

Examining the Roles of Artificial Intelligence in Facilitating Collaborative Learning and Practices in Business Education in Tai Solarin University of Education, Ogun State, Nigeria

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Abstract
The increasing adoption of artificial intelligence (AI) in education has transformed the way students learn and interact, facilitating collaborative learning and practice. This study investigates the roles of AI in facilitating collaborative learning and practices in business education. A mixed-methods approach was employed, combining a survey (structured questionnaire) and observational data from business education programs that have integrated AI-facilitated collaborative learning tools. Three (3) research hypotheses were formulated and tested; the study adopted a purposive random sampling technique with a structured questionnaire to elicit information from the respondents. A sample of 720 students was drawn from the total population of 1,441, representing 50% of the entire population of Business Education undergraduates at Tai Solarin University of Education, Ogun State, Nigeria. The data were analysed using descriptive statistical analysis. The three formulated hypotheses were tested using regression analysis. The results indicated an 85% positive response to the enhancement of collaborative learning with AI in business education curricula. Participants were of the opinion that AI can support the development of essential business skills, such as teamwork, problem-solving, and decision-making. The findings underscore the importance of educators carefully designing and implementing AI-facilitated collaborative learning experiences to ensure they align with learning objectives and promote inclusive participation. This study contributes to the understanding of AI's potential to enhance collaborative learning in Business Education and provides implications for educators, researchers, and practitioners. The study concludes that artificial intelligence (AI) can play a significant role in facilitating collaborative learning and practices in business education. AI can also support the development of essential business skills, such as teamwork, problem-solving, and decision-making.

Keywords: Artificial intelligence, Collaborative learning, Business education, Essential business skills.

1. Introduction

Collaborative learning involves students working together in small groups to achieve a common goal, fostering social interaction, communication, and problem-solving skills. It is an instructional or teaching method that arranges small groups of students to work together to complete an academic assignment and accomplish a learning goal. Collaborative learning often involves group work, where students work together in small groups to achieve a common educational goal or complete a specific task. This instructional method helps students develop and enhance their problem-solving abilities, social interaction and cooperation among students, appreciate diverse perspectives and backgrounds, and spark creativity and innovations among others. Using collaborative instructional techniques for teaching Business Education undergraduates is a welcome development because this method may foster the development of skills such as teamwork, problem-solving, as well as managerial and decision-making skills. In light of this, a significant part of vocational education includes business education. A field of study that is specifically developed to foster abilities, mentalities, appreciation, creativity, and the development of knowledge and skills in the workplace, corporate world, and classroom.

According to Edionwe (2024), Business education can be described as a component of educational training offered in higher schools, subject to public supervision and restrictions, with its impact being noticed in our homes, classrooms, and the community. Business education is designed for

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learners seeking to acquire knowledge through a comprehensive foundation of business and educational principles, enabling them to develop solutions to current business and educational challenges. Since it equips students with the knowledge and skills necessary to thrive in the competitive, rapid business world, business education is an essential part of higher education. Alabi during (2021) stressed that business education is a component of the overall curriculum.

It is part of vocational education. Throughout Nigeria's educational history, business education has been highly recognised. Since it fosters the information, attitude, and vocational skills necessary for job and career progression in business, Business Education is very important to the role of any country.

Learning, developing skills, abilities, qualities, and attitudes necessary for a functioning economy has been referred to as business education. The national education policy supported this stance, placing a strong emphasis on developing the necessary skills, as well as mental, physical, and social abilities and competencies, for people to thrive and support the advancement of society (Edionwe, 2024). The introduction of business education programmes in tertiary institutions is not just a welcome development, but a step towards solving economic problems by imparting skills, knowledge, and attitudes to learners for job creation and employment opportunities. Based on this, Business education, its objectives and students' academic achievement in the course, artificial intelligence is highly needed in order to perform academic functions faster and efficiently. As educators and stakeholders struggle to strike a careful balance between utilising the advantages of AI-enhanced methods of instruction and minimising the risks associated with them, the emergence of Artificial Intelligence (AI) has brought both excitement and anxiety (Alontam et al., 2024).

In the year 1950, artificial intelligence emerged as a field of study. It was discovered to be an integral factor in students' comprehension, learning, and accomplishment of specific tasks, as indicated by the data display. Due to its characteristics and the results it produces, which include the display of academic information in cognitive, emotional, and social manners, it has become known as an analytical, human-inspired intellect. In recent years, a number of channels have made it more commonplace to use artificial intelligence in everyday tasks, like integrating it with instruments used across different sectors. This has linked the employment of AI systems in daily life to better results, suggesting that it is a potent instrument to boost student academic achievement and productivity (Edionwe, 2024). AI technologies have exciting chances to improve instruction and learning while supporting cooperative learning in educational settings. Artificial intelligence has advanced significantly in the field of education in the past few years.

Bessen (2019) states that AI-based platforms and technologies are being applied to automatic evaluation, adaptive exams, intelligent tutoring, and targeted instruction. Enhancing educational outcomes or academic achievement, increasing efficiency, and providing individualised support to students are the goals of these technologies.

Although AI provides students with practical assistance in business settings, a more conceptual understanding of AI's application in business and education is required, encompassing important elements such as actors, actions, and processes. AI tools have shown themselves to be genuinely and greatly beneficial in a variety of industries, including business and education. Computer vision, forecasting structures, information extraction, machine learning, identification of faces, voice or speech detection, laboratory simulations, immersive virtual worlds, hearing and sensing technologies, cutting-edge computing, virtual personalized assistants, real-time analysis, AI chatbot, image recognition, academic analytics, learning adaptive method, and forecasting structures are some of these (Camelia et al., 2023). Institutions will be able to keep up with global digitalisation more quickly if artificial intelligence is incorporated into business education. According to Ralph and George (2023), artificial intelligence is an instrument for equitable growth. Strickland (2021) describes learning analytics (LA) as the measurement, gathering, evaluation, and dissemination of information about students and their surroundings to comprehend and improve learning and the setting in which it occurs. In order to enhance teaching, personalisation, adaptability, and intelligent material, learning analytics; an AI tool, is crucial in business education. The growth of artificial intelligence and its application in business education has inspired educators to gather information, evaluate it, and find solutions to a variety of problems and challenges in the field.

Analysts can utilise the information collected and

stored when learners access social networking sites, learning management systems, MOOCs, and other platforms, as well as actual clicks, navigation, and the duration spent on tasks, to assess and improve the learning environment (Kiron, 2021). Analytics is crucial and required in business education at several levels, including departmental and classroom levels. It produces various results for the enhancement of business education at every level. It provides details on their hobbies, grades, social networks, and IQ in the classroom, among other things. Personalised education, whereby students learn at their own pace, is necessary for analytics learning (Tella, 2021). The Technology Acceptance Model (TAM), developed by Fred Davis in 1989 and referenced in Ezurike (2023), is a framework based on systems theory that models how individuals actually begin to adopt and utilise a particular technology due to its perceived effectiveness.

This means that instructors are able to accommodate more learners in the classroom because it allows for differentiated instruction. The study's foundation was the Technology Acceptance Model (TAM), which explains the importance of the TAM on technology adoption. Teachers' willingness to embrace technology items, including artificial intelligence (AI) technologies, is significantly influenced by perceived usefulness and ease of use. Perceived benefit is the value of utility that a specific technology offers, whereas perceived ease of use is the extent to which a learner feels that using a technology would be effortless (Ezurike, 2023). Regarding this study, perceived usefulness refers to the value that AI technologies offer in facilitating collaboration among business education students. Perceived ease of use indicates that business education students find AI to be beneficial, which can be further enhanced when they can use AI effectively for improved performance.

2. Statement of the Problem

One of the subset of vocational studies is BE which exposes students to practical as well as theoretical expertise in business practice and pedagogy, thereby preparing them for their careers. The program's tagline, "education for and about business," suggests that it includes both the practical applications of business knowledge and the various approaches to business education.

However, the immense benefits of the BE programme to students are enormous, but the major issue confronting these benefits is the poor academic achievement of students in the course. Different stakeholders have raised alarms on the causes of these poor academic achievements in BE. They have complained about the conventional classroom approach of teaching that only encourages teacher-centred learning and limits the extent to which students can learn from outside the world and acquire new knowledge in BE. And that, this conventional classroom method had failed to expose BE students to the intrigues of new technologies usage for learning and the failure to adopt a collaborative instruction. Thus, an attempt was made in ascertain the roles of AI in facilitating collaborative learning and practices in BE at Tai Solarin University of Education, Ogun State, Nigeria.

3. Objectives of the Study

The main objective of the study was to examine the roles of AI in facilitating collaborative learning and practices in BE at Tai Solarin University of Education, Ogun State, Nigeria. The study also further looks into:

1. AI roles in the enhancement of collaborative learning in BE.
2. role of AI in supporting the development of essential Business skills.
3. relationship between AI and BE teamwork skills;
4. relationship between AI and BE problem-solving skills;
5. relationship between AI and BE decision-making skills.

4. Research Questions

1. AI roles in the enhancement of collaborative learning in BE?
2. What is the role of AI in supporting the development of essential BE skills?

5. Hypotheses

$H_0$1: There is no significant relationship between AI and BE teamwork skills.

$H_0$2: There is no significant relationship between AI and BE problem-solving skills.

$H_0$3: AI has no relationship between BE decision-making skills.

6. Methodology

A mixed-methods approach was employed, combining a survey (structured questionnaire) and observational data from business education programs that have integrated AI-facilitated collaborative learning tools. The aggregate inhabitants of this study were 1441 who happened to be BE undergraduates at Tai Solarin University of Education for the academic session of 2024/2025. A sample size of 720 students were drawn using purposive random sampling technique. A structured questionnaire was designed to elicit information from the respondents. Three (3) lecturers in the department of BE was used to validate the instrument, the reliability test was conducted among

Table 1: Descriptive statistics of AI roles in enhancing collaborative learning in the BE Programme

Items	Mean	SD
AI personalising learning experiences.	2.99	.977
AI provide instant feedback.	2.78	.947
AI facilitating group dynamics.	3.04	.803
AI promotes efficient communication.	3.11	.847
AI enhances collaborative activities and group formation based on individual learning styles.	3.22	.872
Cluster Mean	3.03	

Source: Field Survey, 2025

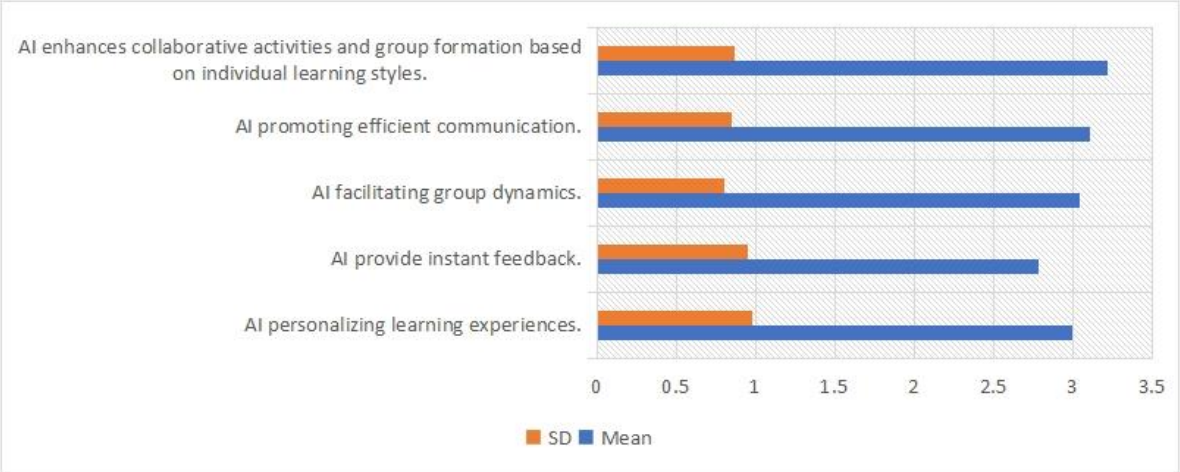

Figure 1: Bar chart showing AI roles in the enhancement of collaborative learning in BE

Table 2: Descriptive statistics on the role of AI in supporting the development of essential Business skills

Items	Mean	SD
AI enhances decision-making skills through data analysis.	3.33	.811
AI data-driven enhances decision-making skills	3.00	.804
AI facilitates teamwork skills through collaborative learning.	3.21	.799
AI promotes effective decision-making skills	2.56	.995
AI enhances problem-solving skills through collaborative learning	2.78	.906
Cluster Mean	2.98	

Source: Field Survey, 2025

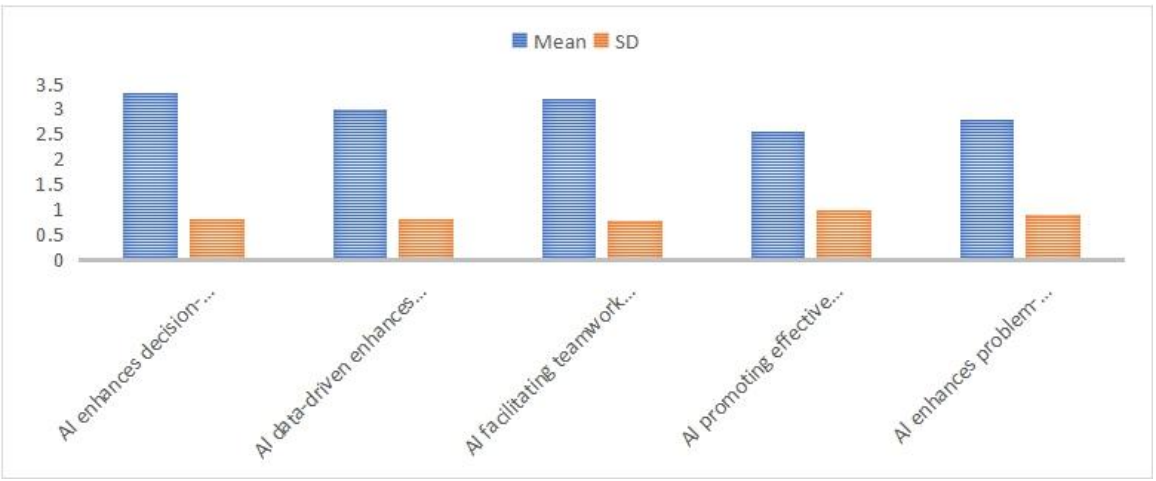

Figure 2: Bar chart showing the role of AI in supporting the development of essential Business skills

Table 3: Relationship between AI and BE teamwork skills

Variables	N	Mean	Std. Dev	df	r_{value}	p_{value}
Artificial Intelligence (AI)	720	21.2840	3.10074	718	.568	.001
Teamwork skills		58.2440	6.60816			

Source: Field Survey, 2025

Table 4: Relationship between AI and BE problem-solving skills

Variables	N	Mean	Std. Dev	df	r_{value}	p_{value}
Artificial Intelligence (AI)	720	21.2878	3.10	718	.452	.001
Problem-solving skills		17.75	2.60			

Source: Field Survey, 2025

Table 5: Relationship between AI and BE decision-making skills

Variables	N	Mean	Std. Dev	df	r_{value}	p_{value}
Artificial Intelligence (AI)	720	21.28	3.10	718	.338	.001
Decision-making skills		16.50	3.06			

Source: Field Survey, 2025

25 Business Education undergraduates in Olabisi Onabanjo University Ago Iwoye, Ogun State, Nigeria, and the data collected were subjected to Crowbach Alpha formula. The reliability coefficient for the instrument was reported as r = 0.93. The researcher, with two research assistants, participated in the questionnaire administration of the study. Research questions were answered using descriptive analysis of mean and standard deviation, and hypotheses were tested using inferential statistics of Pearson Product-Moment Correlation (PPMC). Any mean score of 2.5 and above was regarded as agree, while any score below 2.5 was regarded as disagree. For PPMC, when the p-value is less than the significance level ($p < .05$), the null hypothesis is rejected; otherwise, it is accepted.

7. Results

Research Question 1: What are the roles of AI in enhancing collaborative learning in the BE?

Table 1 showed that the cluster mean was 3.03, which is greater than the benchmark of 2.50. This implies that AI personalising learning experiences, provides instant feedback, facilitates group dynamics, promotes efficient communication and enhances collaborative activities and group formation based on individual learning styles among BE students.

Research Question 2: AI in supporting the development of essential Business skills?

Table 2 revealed that the cluster mean was 2.98, which is greater than the benchmark mean value of 2.50. The implication of these results was that AI enhances decision-making skills through data analysis, facilitating teamwork skills through collaborative learning, promoting effective decision-making skills and enhancing problem-solving skills through collaborative learning.

$H_0$1: There is no significant relationship between AI and BE teamwork skills.

Table 3 depicted that AI and BE teamwork skills directly associated or dance in same direction ($r = 0.568$, $p < 05$).

$H_0$2: There is no significant relationship between AI and BE problem-solving skills.

Table 4 advocated that AI and BE problem-solving skills dance in same ($r = 0.452$, $p < .05$).

$H_0$3: AI has no relationship between BE decision-making skills.

Table 5 depicted that AI and BE decision-making abilities are positively associated, that is, they move in same direction ($r = 0.338$, $p < .05$).

8. Discussion of Findings

AI personalising learning experiences, provides instant feedback, facilitates group dynamics, promotes efficient communication and enhances collaborative activities and group formation based on individual learning styles among BE students. Furthermore, AI enhances decision-making skills through data analysis and pattern recognition, facilitating teamwork skills through collaborative learning outcomes, promoting effective decision-making skills and enhancing problem-solving skills through collaborative learning facilities. It was also indicated that AI is positively related to Business education problem-solving skills and decision-making skills. These findings were in tandem with the Alontam et al. (2024), who concluded based on findings that AI is a viable instrument that has the capacity towards enhancing students' problem-solving skills and that it is capable of enhancing effective communication among the students and teachers. Strickland (2021) believed that AI improve and promotes collaborative learning and helps students to be more engaged in their studies. Ralph and George (2023) found that AI is a viable tool in developing students' decision-making and teamwork skills, while Kiron's (2021) findings agreed that AI serve as an empowerment tool for collaborative learning facilities.

9. Conclusion

Hence, having examined the roles of artificial intelligence in facilitating collaborative learning and practices in BE in Tai Solarin University of Education, Ogun State, Nigeria, the following conclusions were drawn based on the findings of the study:

1. AI provide personalised learning experiences, provides instant feedback, facilitates group dynamics, promotes efficient communication and enhances collaborative activities and group formation based on individual learning styles among BE students;
2. AI enhances decision-making skills through data analysis, data privacy and pattern recognition. It also helps in facilitating teamwork skills through collaborative learning, fostering creativity and innovation, promoting effective decision-making skills and enhancing problem-solving skills through collaborative learning facilities.
3. There was a positive relationship between AI and Business education teamwork skills; students were subjected to a collaborative learning system (CLP) that enabled them to work together on projects, engage in discussion and share resources.
4. There was a positive relationship between AI and BE problem-solving skills; Natural Language Processing (NLP) was introduced to the students, enabling them to facilitate communication among students, instructors and industry professionals.
5. AI and BE students' decision-making skills move in same direction; an AI-powered virtual learning environment was unveiled to students to enable them to simulate real-world business scenarios in order to practice collaborative decision-making more easily.

10. Recommendations

1. It is recommended that collaborative learning software use should be inculcated into the BE programme curriculum
2. Lecturers should explore the potential of AI–powered tutoring systems to provide personalised feedback and support to students for collaborative learning outcomes.
3. Learning management systems should be provided to facilitate collaborative learning through discussion forums, group projects and peer review.

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