

## APPLICATION OF ARTIFICIAL INTELLIGENCE IN TEACHING BUSINESS EDUCATION COURSES IN COLLEGES OF EDUCATION

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### Abstract

*Artificial intelligence has revolutionized various professions and its potential in enhancing teaching business education cannot be ignored. This paper explores the application of artificial intelligence in teaching business education courses in south west Nigeria colleges of education. The study adopted survey research design comprising a population of 167 business educators from south west Nigeria colleges of education from which 55 business educators were purposively sampled. Four colleges of education in Oyo and Osun states were covered by the study. Two research questions and two hypotheses guided the study. The instrument for the study was a questionnaire designed by the researcher which was validated by two experts in business education. The instrument for the study was pilot-tested in two colleges of education not selected for the study. Cronbach's alpha reliability method was used to confirm the reliability of the instrument which yielded 0.83 coefficient. Mean and standard deviation were used to analyse data collected for the research questions, while t-test statistic was used to test the hypotheses at 0.05 level of significance. Findings from the study indicates that the level of awareness and application of AI among business educators is low. This study concluded that there is low awareness and low application of AI in teaching business education courses in south west Nigeria colleges of education and the situation calls for urgent attention. The researcher recommended that seminars and workshops should be organized on regular basis to sensitise and upgrade business educators' skills on the application of AI in teaching and learning.*

**Key words:** Artificial Intelligence, Application, Teaching, Learning, Business Educators

### Introduction

Global technological advancement brought about diverse digital instrument that is being used in different professions, one of which is artificial intelligence (AI). The emergence of artificial intelligence (AI) has led to tremendous changes in the way things are done worldwide to the extent that its application in business education is indispensable. Artificial Intelligence is a collaborator in education that improves content and competencies while also enhancing human abilities in work environments. Elhajjar, Karam, and Borna (2021) promoted using AI in education to provide students with the skills they need for future employment. Such skills are essential to meet the requirements of the digital society, including creativity, innovation, and imaginative thinking. AI uses a variety of tools, methods, and systems in teaching. Despite common distrust and misunderstandings over AI's role in human activities, particularly in education, advancing human capital through AI tools is essential for society's growth (Antonenko and Abramowitz, 2023).

Future developments in AI technology in education are expected to bring both new opportunities and difficulties (Khosravi *et al.*, 2022). Researchers, policymakers, and practitioners are currently adopting AI to improve administrative services, assessments, personalized learning



and instruction. Despite some organizational difficulties, Artificial Intelligence (AI) is a symbol of educational advancement that offers advantages on several levels. It helps in enhancing teaching and learning through technologies like; chatbots, robots, automated evaluation, digital artifacts, and intelligent tutoring systems (Chiu, Xia, Zhou, Chai and Cheng, 2023). As efforts are on to incorporate these approaches into the educational system, online and blended learning are becoming common in contemporary societies and developing economies. AI offers workable solutions to complex societal problems by allowing students to interact directly with global issues. It also assists in improving students' problem-solving abilities in the real-world situations. Artificial Intelligence has altered our perceptions, knowledge, actions, and business practices.

Considering the future job demands, teachers need to teach students those skills that will enable them to adjust to changes and follow trends of events in their environment. As a result, there is a growing need for creative educators who can integrate new resources and facilitate students-AI interactions in the classroom. Artificial Intelligence is an intelligence performed by machine as opposed to natural intelligence demonstrated by human being and animals. This means that machines can perform tasks like intelligent beings and animals. Artificial Intelligence is embedded with the ability to reason, make meaning, generalize or learn from past experiences. Artificial Intelligence has been divided into particular traits, such as learning, reasoning, problem solving, perception, translation between languages, planning and speech recognition.

According to Han, Park, and Lee (2022), Artificial Intelligence (AI) tools and services include computer vision, prediction systems, mining of data, intelligent learning and instruction systems, learning analytics, facial identification systems, voice or speech recognition systems, online laboratories, augmented reality, virtual reality, devices for hearing and sensing, edge computing, automated personal assistants, real-time analysis, AI chatbot, image recognition, individualized learning approach, academic analytics, and adaptive learning method. Artificial intelligence in the educational sector has influenced the activities of students, administrative staff and lecturers. Artificial Intelligence is used by teachers and students from nursery to tertiary education level. Some of the technical applications are; teaching robots, intelligent tutoring systems, and adaptive learning system.

Artificial Intelligence systems in education are required to enhance learners' involvement and performance. Artificial Intelligence systems are needed to improve student engagement and performance in the classroom. According to Chiu *et al.* (2023), competency-based assignments, learner-machine dialogues, feedback, and adaptable digital environments are all crucial AI functions for learners. Artificial Intelligence assists teaching and learning through the provision of smart contents such as; digitalized books, video lectures, lecture notes, among others. Smart content allows easy access to education through remote and individualized contacts, unlike physical classroom environment. Smart contents increase students' learning and assist teachers in transmitting knowledge. AI enhances efficiency so that learning can be designed in line with each pupil's requirements by personalizing communication and learning experiences to meet their unique needs and talents. Students' strengths and shortcomings are addressed through customized learning materials created based on their assessment (Hopcan, Polat, Ozturk, and Ozturk, 2022). In virtual environments, customizing learning experiences ensures student attention and progress while encouraging skill growth. AI offers a crucial advantage for remote learners through simulation cases on complex life topics requiring attention in traditional settings (e.g., welfare system, losses, and violence) (Asakura, Occhiuto, *et al.*, 2020). Additionally, Zhang and Aslan (2021) noted that AI supports educators and the teaching process by providing individualized learning materials, learning prediction models, better classroom management, improved instruction across various subjects, academic progress facilitation, pedagogical skill development, human



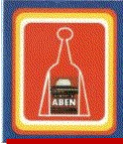
behaviour, and interactions. According to Crescenzi-Lanna (2023), with the use of AI technology, educators can include elements of students' behaviour—such as emotions, attention, gestures, and movement—into their teaching method.

Artificial Intelligence Learning Analytics (LA) is used for measurement, collection, analysis and reporting of data about learners and their context, in order to understand and optimize learning and learning environment (Strickland, 2021). These Artificial Intelligence applications not only give a rapid assessment of large numbers of students but also give the same standards without bias. According to Redcay and Schilbach (2019), assessment of students entails collecting, interpreting, analyzing and acting on information about the students' performance according to learning goals. To better understand and optimize learning and the learning environment, artificial intelligence Learning Analytics (LA) measures, collects, analyzes, and reports data on learners and their context (Strickland, 2021). In addition to the provision of quick evaluation of a large number of pupils, these AI apps also offer the same standards impartially. Redcay and Schilbach (2019) stated that gathering, understanding, analyzing, and working on data regarding students' performance in relation to learning objectives constitutes the essence of student assessment. Automatic grading and students' expected performance in virtual classes are the two primary benefits of AI assessment (Chiu et al., 2023). Students receive fast, helpful feedback following the evaluation procedure, and teachers can help pupils develop particular abilities. The benefits of AI for evaluation include increased uniformity and efficiency (Chassignol et al., 2018).

Artificial Intelligence in education administration involves; supporting and enhancing the performance of management platforms, analysis of scaled data, personalisation of various academic services, increasing work efficiency of administrative staff, and consistency in the decision-making process (Zhang and Aslan, 2021). AI applications help to minimize workload of lecturers and provides time for other tasks. Assessment of assignments, quizzes and answer scripts are arduous tasks for teachers, but automatic assessment by computers offers a great solution (Khan and Jawaid, 2020). Therefore, Artificial Intelligence applications could be used in the students' performance assessment and grading in business education administrative tasks. It helps to ensure impartiality and effectiveness in students' assessment.

Moreover, businesses derive gains from artificial intelligence-based education through the enhancement of entrepreneurial competencies and promotion of innovation (Nuseir, Basheer, and Aljumah, 2020). AI can complete tasks that take up teachers' time more quickly, in the area of; determining pupils' interests and learning styles to create individualized lesson plans, giving them prompt, straightforward feedback, or helping teachers with data-related actions or tasks (Chen, Chen, and Lin, 2020). Artificial Intelligence technology can make business education and its administration smarter. These can be achieved through introduction of self-teaching classroom and machine in a globally acknowledged way. Business education in the 21<sup>st</sup> century must embrace modern technology to provide a conducive learning environment for teachers and learners.

A business educator is a professionally qualified instructor whose role involves designing, delivering, and assessing business-oriented instruction (e.g. accounting, marketing, entrepreneurship, office management) in educational institutions; they combine subject-matter knowledge with pedagogical skills to equip learners with both theoretical understanding and practical, employability-oriented competencies. Olowe and Enijuni (2024) outlines the essential competencies business educators as; professional competency (teaching, curriculum management), administrative competency, and human-skills competencies. Business educators also serve as facilitators, mentors, and curriculum innovators who align teaching with industry expectations and societal needs. Adopting AI in education can change the way business education and its administrative staff use their time and how students are taught individually (Li, Gobert and



Dickler, 2019). Artificial Intelligence applications assist the educational sector in both administrative and academic activities. Artificial Intelligence can be adopted in business education in areas such as the admission process, provision of counselling services, library services, assessment, feedback, and tutoring, among others. Different types of evaluation, behaviour patterns and many other elements can be obtained and assisted through Artificial Intelligence (Chen *et al*, 2020).

In an attempt to promote the development and advancement of AI within the country, the Nigerian government established the National Agency for Research in Robotics and Artificial Intelligence (NARRAI) in 2018. The agency was established to coordinate and control all researches relating to AI and robotics (Thomas, Gambari, Sobowale, and Shehu, 2024). The agency is expected to collaborate with international research bodies, work with tertiary institutions and promote Nigeria's ability to leverage AI technologies for economic growth (Ladeinde, 2019). Eze (2020) opined that the successful implementation of educational innovations depends largely on the skills and knowledge of the lecturers. Despite the establishment of the agency by the federal government, many educational institutions in Nigeria have not been utilizing the opportunities offered by AI optimally. This is due to many challenges such as inadequate infrastructural facilities, funding, lack regular capacity building training for lecturers among others.

Many studies have confirmed low application and utilization of modern technologies by lecturers including business educators. The study conducted by Madu and Musa (2024) revealed moderate level of AI awareness by lecturers, and established positive relationship between lecturers' level of awareness of AI and their digital competence. Also, Amadi-Iwai, Ubulom, and Okiridu (2024) in their study on the awareness, competence and utilization of artificial intelligence for improved job performance by business educators in universities in south-south Nigeria reported a low level of awareness of artificial intelligence. The study also indicated inadequate competence of business educators on the application of artificial intelligence in teaching. Again, the study of Thomas, Gambari, Sobowale and Shehu (2024) on the assessment of lecturers' utilisation of artificial intelligence for education in a Nigerian university also found that lecturers rarely use AI.

The present situation of teaching of business education courses in south west Nigeria colleges of education shows that they have not significantly complied with the use of advance technologies (including AI) due to some barriers such as inadequate infrastructure, poor internet services, insufficient training and retraining of lecturers among others. Consequently, there is a need to integrate AI in business education programmes offered by Nigerian educational institutions to improve the performance of teachers in producing graduates with globally relevant skills. In line with these findings, this study seeks to determine the level of application of AI in teaching by business educators in south west Nigeria colleges of education.

### **Statement of the Problem**

Artificial intelligence plays important roles in supporting innovative and personalized learning process as evident in its adoption by professionals worldwide. Despite the growing significance of artificial intelligence (AI) in various industries, its application in business education remains limited. Effective integration of AI in teaching and learning practices by business educators is still evolving. The low level of awareness of AI's potential to enhance student learning outcomes, combined with the absence of a clear framework for application of AI in business education, could hinder the ability of business educators to leverage AI's benefits. This will ultimately impact on the preparedness of future business entrepreneurs and leaders to succeed in an increasingly AI-driven world. This study was carried out to determine the level of application of artificial Intelligence in teaching and learning by business educators in south west Nigeria colleges of education.



### Research Questions

The following research questions guided the study:

1. What is the level of awareness of artificial intelligence (AI) among business educators in colleges of education?
2. What is the level of application of artificial intelligence (AI) in teaching and learning by business educators in colleges of education?

### Hypotheses

The following hypotheses were tested as 0.05 level of significance:

1. There is no significant difference between the mean ratings of business educators in Oyo and Osun States on the level of awareness of artificial intelligence (AI).
2. There is no significant difference between the mean ratings of business educators in Oyo and Osun States on the level of application of artificial intelligence (AI) in teaching and learning.

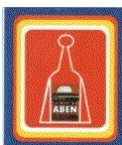
### Method

The research design adopted for this study is descriptive survey research design. The population for the study comprised 167 business educators from south west Nigeria colleges of education. Fifty-five (55) business educators from Federal College of Education, Iwo, Osun state College of Education, Ila-Orangun, Federal College of Education, Oyo, and Oyo State College of Education, Lanlate were purposively sampled for the study. The instrument used to gather responses from respondents was a questionnaire designed by the researcher. The questionnaire was divided into three sections: Section A for the collection of demographic data of respondents, Section B for the collection of data on the level of AI awareness among business educators and Section C for eliciting responses on the level of AI application in teaching and learning by business educators. The instrument for the study was based on four-point rating scales of Highly Aware (HA), Moderately Aware (MA), Lowly Aware (LA), Not Aware (NA), for section B and Highly Applied (HA), Moderately Applied (MA), Lowly Applied (LA), Not Applied (NA) for section C. The instrument for the study was pilot-tested in two colleges of education not selected. Cronbach's alpha reliability method was used to confirm the reliability of the instrument which yielded 0.83 coefficient. Questionnaire items with the mean of 2.50 and above were rated as highly aware and highly applied while items with the mean of 2.49 and below were rated as lowly aware and lowly applied. The two hypotheses formulated for the study were analyzed with t-test static at 0.05 level of significance.

### Results

**Table 1: Mean and standard deviation of awareness of artificial intelligence (AI) among business educators in colleges of education**

S/N	Awareness of Artificial Intelligence	X	SD	Decision
1	Search engines like; consensus, elicit, connected papers, Research Rabbit, CORE, BASE, Google scholar, Researchgate, RefSeek, and semantic scholar	2.54	0.83	MA
2	Voice and Facial Recognition Systems	2.53	0.64	MA
3	Grammar and paraphrasing tools like; Quillbot, Paperpal, Grammarly, and Trinka	2.57	0.69	MA
4	Hearing and Sensing Technologies	1.05	0.91	LA



5	Data analysis tools like; Python, ATLAS.ti, Tableau, SPSS, MySQL, Jasp and R, Nvivo, SAS, and Microsoft Excel	2.51	0.75	MA
6	Edge computing	2.06	0.92	MA
7	AI writing assistants such as ChatGPT, Wordtune, and AI Bard	2.52	1.03	MA
8	Augmented Reality	1.36	0.71	LA
9	Virtual Personalized Assistants	1.41	0.66	LA
10	Citations management tools like; Endnote Mendeley, Zotero, and JabRef	1.17	0.85	LA
11	Adaptive Learning Method	1.38	0.76	LA
12	Real-Time Analysis	1.55	0.73	LA
13	Computer-Vision	1.44	0.69	LA
14	Academic and Learning Analytics	1.37	0.85	LA
15	Plagiarism checkers such as Grammarly, Turnitin, Dupllichecker, and Quillbot	2.70	1.05	MA
16	Prediction Systems	1.56	0.77	LA
17	Intelligent Learning Systems	1.52	0.64	LA
18	Image recognition	2.56	0.82	MA
19	Virtual Laboratories	1.57	0.56	LA
20	Data Mining	1.65	0.74	LA
<b>Grand Mean</b>		<b>1.85</b>	<b>0.78</b>	<b>LA</b>

Source: Field Survey, 2024

Table 1 shows that the respondents were moderately aware of items 1, 2, 3, 6, 7, 15, and 18 while the rest 13 items with mean range of 1.05 – 1.65 indicates low awareness of artificial intelligence by the business educators. The grand mean of 1.85 reveals that the level of AI awareness by business educators in south west Nigeria colleges of education is low. The cluster mean of 0.78 shows that respondent opinions were not far apart.

**Table 2: Mean and standard deviation of application of artificial intelligence (AI) in teaching and learning by business educators in colleges of education**

S/N	Application of Artificial Intelligence	X	SD	Decision
1	Grading/Assessment of students	3.08	0.94	HA
2	Admission exercise	2.14	0.69	MA
3	Data collection for measurement, analysis and reporting of learners' performance	2.32	0.88	MA
4	Selection and presentation of learning content;	1.11	0.74	LA
5	Supporting implementation of learning strategies	2.06	1.01	MA
6	Monitoring of learners' progress	1.31	0.66	LA



7	Personalising learning content for each student	1.07	0.89	LA
8	Creating simulations on real-world business interactions	1.55	0'66	LA
9	Navigating datasets for understanding business trends	1.40	0.78	LA
10	Real-time assistance and feedback	1.62	0.69	LA
11	Conference, seminars, workshops presentations	2.73	0.59	MA
12	Literature review on business publications	3.48	0.98	HA
<b>Grand Mean</b>		<b>1.99</b>	<b>0.74</b>	<b>LA</b>

**Source:** Field Survey, 2024

The result presented in Table 2 reveals that respondents rated items 1, 2, 3, 5, 11, 12 as moderately applied while items 4, 6, 7, 8,9, and 10 having the means score range of 1.07 – 1.62 were rated lowly applied. The grand mean of 1.99 implies that the level of application of AI by business educators in south west Nigeria colleges of education is low.

**Table 3: Independent t-test analysis of Oyo and Osun states college of education business educators on the level of awareness of Artificial Intelligence for teaching and learning**

Group	N	X	SD	Df	t-Value	P-Value	Decision
Oyo State Business Educators	36	2.67	0.90	53	0.68	0.430	Not significant
Osun State Business Educators	19	2.75	0.85				

**Source:** Field Survey, 2024

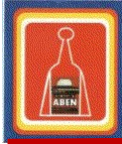
The data in Table 3 indicates no significant difference between the mean responses of Oyo and Osun States colleges of education business educators regarding the level of awareness of the use of artificial intelligence in teaching and learning ( $t_{55} = 0.68, P > 0.05$ ). Therefore, the null hypothesis was not rejected.

**Table 4: Independent t-test analysis of Oyo and Osun states college of education business educators on the level of application of Artificial Intelligence in teaching and learning**

Group	N	X	SD	Df	t-Value	P-Value	Decision
Oyo State Business Educators	36	1.84	0.82	53	0.68	0.250	Not significant
Osun State Business Educators	19	1.92	0.70				

**Source:** Field Survey, 2024

Table 4 reveals that there was no significant difference between the ratings of Oyo and Osun states colleges of education business educators on the level of application of AI in teaching and learning ( $t_{55} = 0.68, P > 0.05$ ). The hypothesis was accepted because the p-value was greater than 0.05 level of significance.



### **Discussion of Findings**

Findings from this study showed that there is low awareness of the use of AI in teaching and learning among business educators in south west Nigeria colleges of education. The findings confirm that business educators were moderately aware of AI tools like; search engines, paraphrasing, edge computing, voice recognition system, facial recognition system and data analysis, among others. The study revealed that the respondents have low awareness about the functions of AI such as virtual personalised assistants, citations management tools, adaptive learning method, real-time analysis, academic and learning analytics, and data mining. This result conforms with the study of Amadi-Iwai, Ubulom, and Okiridu (2024) on the awareness, competence and utilization of artificial intelligence for improved job performance by business educators in universities in south-south Nigeria which asserted a low level of awareness of artificial intelligence.

The findings of this study further established low application of artificial intelligence in teaching and learning by business educators in south west Nigeria colleges of education. The respondents indicated moderate application of AI in; grading/assessment of students, admission exercise, data collection for measurement, analysis and reporting of learners' performance, supporting implementation of learning strategies, conference, seminars, and workshops presentations. However, application of AI in; selection and presentation of learning content; monitoring of learners' progress, personalising learning content for each student, creating simulations on real-world business interactions, navigating datasets for understanding business trends, and real-time feedback were rated lowly applied. This finding is in line with the study conducted by Thomas, Gambari, Sobowale and Shehu (2024) on the assessment of lecturers' utilisation of artificial intelligence for education in a Nigerian university which found that lecturers rarely use artificial intelligence (AI).

The study further revealed that no significant difference exists between the mean responses of business educators in Oyo and Osun states colleges of education in south west Nigeria on the awareness of the use of artificial intelligence (AI) in teaching and learning. The study also shows that no significant difference exists in the mean ratings of business educators in Oyo and Osun states colleges of education in south west Nigeria on the application of artificial intelligence (AI) in teaching and learning. Consequently, the hypotheses were not rejected.

### **Conclusion**

Business educators have a duty to prepare students for success in the constantly changing and fast-paced business world. In view of this, they must be ready to adjust to the most recent trends and changes in the business sphere. AI offers abundant opportunities for accessing real-time information in the business world. The immense benefits and potentials of artificial intelligence makes it an imperative for educational development. It is obvious that AI is receiving great impetus worldwide and business educators must also embrace it to inject innovations into the teaching and learning process. Despite the low awareness and application AI in teaching and learning in the area covered by this study, application of AI in teaching and learning business education is imperative. Business educators at all levels of education in Nigeria must upgrade their knowledge of AI to enhance its effective application in educational processes. This will enable them to play crucial roles in shaping the future of business and propelling the achievements of business education beneficiaries.



### Recommendations

The following recommendations were made according to the findings of the study:

1. Sensitisation programmes should be put in place by all educational institutions and stakeholders to increase business educators' awareness about the use of AI in teaching and learning.
2. Seminars and workshops should be organized by colleges of education in south west Nigeria on regular basis to upgrade business educators' skills on the application of AI in teaching and learning process.

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