



Artificial Intelligence and Business Education Contents Delivery in Public Universities in Calabar, Cross River State, Nigeria

Patrick Etim Oche, Johnson Awhen Ekunke and Lilian Eddy-George³

ochepatricketim@gmail.com, ekunkejohanson001@gmail.com

Department of Business Education,

Faculty of Vocational and Entrepreneurial Education,

College of Education, University of Calabar, Nigeria

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Abstract

This study ascertained the influence of artificial intelligence on business education contents delivery in public universities in Cross River State, Nigeria. The study was motivated by the increasing integration of artificial intelligence into higher education and the need for Business educators to acquire AI competencies that enhance instructional effectiveness. Specifically, the study focused on AI prompt engineering skills and AI-powered content development skills as key dimensions of artificial intelligence skills acquisition and their influence on Business educators' content delivery. A descriptive survey research design was adopted, with a population of 63 Business educators in public universities in Cross River State. There was no sample as the entire population was used for the study. The instrument used for data collection was a structured questionnaire titled Artificial Intelligence and Business Education Content Delivery Questionnaire (AIBECDQ). Simple linear regression was used to test the hypotheses at 0.05 level of significance. The findings indicated that generative AI (F-value = 508.263, $P \leq .000$) and AI-powered learning management system ((F-value = 518.263, $P \leq .000$) influence Business educators' content delivery by improving lesson preparation, instructional material development, classroom engagement, and assessment practices. The study concluded that continuous acquisition of AI skills is essential for effective content delivery and improved teaching quality in Business Education. Based on the finding, it was recommended among others that University management should organize regular training programmes, workshops, and professional development sessions on generative AI to equip Business educators with the competencies required to effectively integrate artificial intelligence tools into lesson preparation, instructional material development, classroom delivery, and assessment.

Keywords: *Artificial intelligence, business education, content delivery, public universities.*

Introduction

The emergence of Artificial Intelligence (AI) has transformed virtually every sector of human endeavour, including healthcare, finance, manufacturing, agriculture, and education. In higher education, AI is increasingly reshaping teaching, learning and research. It provides intelligent tools that improve instructional planning, content development, assessment, and student engagement. Universities around the world are embracing AI technologies to enhance teaching

effectiveness, personalize learning experiences, and prepare graduates with competencies required in the digital economy (UNESCO, 2023; OECD, 2023). Akputu *et al.* (2026) stated that artificial intelligence (AI) supports teachers in understanding learners' needs, predicting performance, and designing adaptive learning environments.

The rapid development of generative artificial intelligence applications, including ChatGPT, Google Gemini, Claude, Microsoft Copilot, Gamma AI, Canva AI, and MagicSchool AI, has significantly transformed instructional practices in higher education. In the same vein, Ebam and Ekunke (2025) highlighted some of the artificial intelligence tools used to improve educational outcomes to include intelligent tutoring systems, learning management systems (LMS), automated assessment and feedback. Unlike conventional educational technologies, these AI-powered applications assist educators in generating lesson plans, preparing lecture notes, designing presentations and developing assessment items. It also helps in producing multimedia instructional resources, and providing personalized feedback to learners. Consequently, educators are increasingly expected to acquire AI competencies that enable them to integrate these technologies into classroom instruction effectively (Ogunleye et al., 2024; UNESCO, 2023).

Business Education, as a discipline designed to prepare learners for careers in business, entrepreneurship, accounting, management, office technology, and marketing, is particularly influenced by these technological developments. Oche et al. (2021) described business education as an essential part of general education which is concerned with the impartation of business orientation and knowledge for personal and national development. The objectives of Business Education can only be achieved when educators adopt innovative instructional approaches that promote critical thinking, creativity, collaboration, digital competence, and entrepreneurial skills. As educational technologies continue to evolve, Business educators are expected to possess digital competencies that enable them to design engaging learning experiences, simplify complex concepts, and prepare students for technology-driven workplaces (Edet & Iniobong, 2024; Atah et al., 2025).

Content delivery remains one of the most important responsibilities of Business educators because it determines the extent to which students understand, retain, and apply knowledge acquired during instruction. Effective content delivery involves careful lesson preparation, appropriate teaching methods, utilization of instructional materials, learner engagement, continuous assessment, and timely feedback. Traditionally, Business educators relied on lectures, printed instructional materials, and conventional teaching aids. However, the emergence of AI has introduced more innovative approaches to instructional delivery through intelligent tutoring systems, adaptive learning platforms, generative AI applications, and multimedia content creation tools that support active and learner-centred instruction (Atah et al., 2025; Bassey, 2025).

For Business educators to benefit from these technological innovations, they must first acquire relevant AI skills. Artificial Intelligence skills acquisition refers to the process through which educators develop the knowledge, technical competencies, and practical abilities required to utilize AI applications effectively for instructional planning, teaching, assessment, research, and academic administration. AI skills acquisition enables educators to automate routine academic tasks, improve instructional efficiency, generate quality teaching resources, personalize learning experiences, and enhance students' engagement during classroom instruction. Recent studies have identified AI competency as one of the essential professional skills required of university lecturers in the digital era (Otum & Okute, 2025; Ofume, 2025).

Among the numerous AI competencies available today, AI prompt engineering skills have emerged as one of the most valuable competencies for educators. Prompt engineering refers to the ability to design, structure, and refine clear instructions or prompts that enable generative AI systems to produce accurate, relevant, and context-specific outputs. Business educators with prompt engineering skills can effectively use AI to generate lesson notes, case studies, business scenarios, classroom discussions, quizzes, assignments, examinations, marking guides, and research summaries that align with curriculum objectives. Effective prompt engineering also enables educators to customize AI-generated responses according to students' learning needs, course

objectives, and institutional standards, thereby improving instructional quality and efficiency (Ogunleye et al., 2024; Otum & Okute, 2025).

Similarly, AI-powered content development skills, which refer to the ability of educators to employ artificial intelligence applications in designing, developing, and organizing instructional resources for effective teaching and learning. These skills include the use of AI to generate lecture notes, PowerPoint presentations, instructional videos, animations, case studies, infographics, assessment items, lesson plans, and interactive learning materials. AI-powered content development enhances the quality, creativity, and accessibility of instructional materials while reducing the time required for lesson preparation. Consequently, Business educators who possess these competencies are more likely to deliver course content effectively and stimulate meaningful student engagement (Atah et al., 2025; Ogunleye et al., 2024).

Recent developments in higher education indicate that AI-powered instructional materials promote active learning by enabling educators to present complex concepts through multimedia resources, simulations, intelligent tutoring systems, and adaptive learning platforms. These technologies support differentiated instruction, encourage collaborative learning, and improve students' comprehension of abstract business concepts. Consequently, AI-powered content development has become an essential professional competency for Business educators operating in technology-driven learning environments (UNESCO, 2023; Russell & Norvig, 2020).

Business educators are expected to prepare graduates who can function effectively in modern workplaces characterized by digital transformation and automation. To achieve this objective, educators must continuously update their technological competencies to align with emerging instructional innovations. Studies have shown that AI applications support curriculum implementation by simplifying instructional planning, improving classroom interaction, enhancing assessment practices, and facilitating personalized feedback to learners. These developments have repositioned AI from being merely a technological innovation to becoming an indispensable instructional resource in Business Education (Otum & Okute, 2025; Atah et al., 2025).

Generative AI is a type of artificial intelligence that creates new content, such as text, images, video, audio, and code, based on patterns it learns from existing data. Generative AI analyse extensive data sets to identify common patterns and structures, subsequently leveraging this knowledge to generate realistic outputs. GAI is used in various fields like education, health, content creation and law and business (Aydin & Karaarslan, 2023). ChatGPT, GitHub Copilot, Google Bard, DALL E3, Claude 2, Midjourney, Llama 2, xAI are some of the examples for Generative AI. Generative AI is used in software development, education, health content creation, law and language translation. It assists software professionals in writing the code, explaining the code, code completion, source code auto completion, scraping data from known platforms, review its code, suggest improvements for better performance, and provide answer to code related questions in a user-friendly conversation format.

GAI tools are used in various activities of packaged food businesses. It is used in fixing the structural design of the package. It is helpful for analysing various packaging materials and generating visually impactful graphics, logos, colours and fonts. It can analyse labelling content for accuracy and compliance with regulatory standards. GAI can assist in translating labels into multiple languages. GAI can assist in generating content for marketing materials. GAI powered systems can perform virtual simulations to ensure that packaging design meet quality standards. GAI powered systems also helps the packaged food companies to change manual recipe development, manual consumer surveys and manual quality control inspection.

It helps to design packaging materials, automate visual inspection process, predicting equipment failures, optimizing delivery routes, forecasting demand for packaged food products. GAI powered chatbots ensures customer support, real time tracking and monitoring of packages, inspect label printing quality and detecting any errors in text, graphics and barcodes. QR codes on labels ensure supply chain traceability. GAI powered systems have several applications in packaged food business. Therefore, my study is concentrated on whether the consumers are aware about these applications of GAI in packaged food business.

AI-powered learning systems use machine learning and data analytics to customize educational content, pacing, and feedback for individual students. AI-powered learning systems are increasingly being used in business education to enhance student engagement, motivation, and interactivity (Agadagba & Ekwevugbe, 2025). Engagement is a critical determinant of academic success, and AI-powered systems have demonstrated potential in fostering engagement and improving learning outcomes (Bandura, 1986). In business education, AI-powered learning systems can replicate real-world business scenarios, offering students hands-on experience and practical skills (Bloom, 1968). The integration of these systems into the business education curriculum can enhance student engagement and improve learning outcomes.

Business education, in particular, requires a unique combination of theoretical knowledge and practical application, both of which can be effectively provided by AI-powered learning systems (Bloom, 1968). By simulating real-world business situations, these systems help students develop critical skills such as problem-solving, decision-making, and critical thinking (Bognár, 2024). Additionally, AI-powered systems facilitate personalized learning, allowing students to learn at their own pace and focus on areas where they need the most improvement (Chen et al., 2022). Furthermore, the use of AI in business education helps bridge the gap between theoretical concepts and practical applications, offering students hands-on experience with real-world business challenges (Deci & Ryan, 2000). These systems also foster collaboration and communication among students, enhancing teamwork and community building (Ellikkal & Rajamohan, 2025). As a prominent institution in teacher education, the university stands to gain from incorporating AI-powered learning systems into its business education curriculum.

(Feuerriegel et al., 2023) conducted a study on Generative Artificial Intelligence. Generative Artificial Intelligence has the capability of generating text, images and audio from trained data. Every business organisation can use GAI for managing their resources judiciously thereby reducing cost and wastage and increasing efficiency and profitability. Without adapting the changes that are taking place in the business environment there is limited chance for the business organisation for its

development. The study is a descriptive study and examines the awareness of students regarding the use of GAI in packaged food business.

Surugiu et al. (2024) examined AI's support for educational activities, key drivers, and tools for business education. Survey data collected from 254 learners were analysed using multivariate binary logistic regression. Two research questions were formulated to verify if AI supports educational activities and what AI tools support business educational activities. Results show learners appreciate AI for aiding teachers in administrative tasks, personalising learning plans, and saving time. However, learners are unfamiliar with most benefits of AI tools, except computer vision, edge computing, and AI chatbots. The paper highlights the need to increase the use of AI in education to make students more familiar with AI tools and capitalise on them in business education.

A study by Otum and Okute (2025), involving Business educators in the University of Calabar and the University of Cross River State, reported that while AI offers significant prospects for improving course delivery, challenges such as inadequate pedagogical knowledge, limited AI tools, and insufficient institutional support hinder its effective application. Similarly, Atah et al. (2025) observed that AI applications such as intelligent tutoring systems and adaptive learning platforms improve Business Education curriculum delivery by promoting interactive teaching, individualized learning, and enhanced instructional effectiveness. However, the authors emphasized that successful implementation depends largely on educators possessing adequate AI competencies and institutions providing supportive technological infrastructure.

Olom and Atah (2025) found that the utilization of AI significantly improves instructional preparation among Business educators, while Otu et al. (2024) reported that AI tools enhance the delivery of Core Curriculum and Minimum Academic Standards (CCMAS) in Nigerian universities. These findings reinforce the growing importance of AI prompt engineering and AI-powered content development skills in contemporary Business Education. Despite these reported benefits, many Business educators have not fully acquired the competencies required to exploit AI

technologies for effective instructional delivery. Ofume (2025) noted that inadequate training, ethical concerns, poor funding, unstable internet connectivity, and limited institutional policies continue to impede AI integration in Business Education research and teaching. It is against this backdrop that this study is developed to ascertain the influence of artificial intelligence on business education content delivery in public universities in Cross River State.

Statement of the Problem

Many Business educators in Nigerian universities have not fully acquired the AI skills required for effective instructional delivery. In particular, competencies such as AI prompt engineering skills, which enable educators to generate accurate and curriculum-aligned instructional content, and AI-powered content development skills, which facilitate the creation of multimedia teaching resources, are still limited among many lecturers. As a result, some educators continue to rely heavily on traditional methods of lesson preparation and content delivery, thereby limiting the effective utilization of AI in Business Education. Furthermore, inadequate training opportunities, poor technological infrastructure, limited institutional support, unstable internet connectivity, and insufficient AI policies have continued to hinder the acquisition and utilization of AI competencies in Nigerian public universities. These challenges may negatively affect lesson preparation, instructional material development, classroom presentation, learner engagement, and the overall quality of content delivery by Business educators.

Although several studies have examined the general application of artificial intelligence in education, relatively few have specifically focused on how generative AI and AI-powered learning system influence business education content delivery in public universities in Calabar, Cross River State. This gap in the literature creates the need to examine these AI competencies and their relevance to effective instructional delivery. It is against this background that this seminar examines artificial intelligence skills acquisition and business education content delivery in public universities, Cross River State.

Objectives of the study

The objective of this study is to ascertain the influence of artificial intelligence on business education content delivery in public universities in Cross River State. Specifically, the study sought to ascertain the influence of:

1. Generative AI on business education content delivery in public universities in Cross River State.
2. AI-powered learning management system on business education content delivery in public universities in Cross River State.

Research questions

The following research questions guided the study:

1. To what extent does generative AI influence Business education content delivery in public universities in Calabar, Cross River State?
2. To what extent does AI-powered learning management system influence Business education content delivery in public universities in Calabar, Cross River State?

Research Hypotheses

The following null hypotheses were formulated and tested at the 0.05 level of significance:

- i. There is no significant influence of generative AI on business education content delivery in public universities in Cross River State.
- ii. There is no significant influence of AI-powered learning management system on business education content delivery in public universities in Cross River State.

Research methodology

This study adopted a correlational survey research design. The population of the study comprised all business educators in three public universities in Cross River State. According to departmental records from the three universities in (2026), the population consists of 63 Business educators, made up of 41 lecturers from the University of Calabar, 15 lecturers from the University of Cross River State and 7 lecturers from University of Education and Entrepreneurship, Akamkpa.

Since the population is relatively small and manageable, the study adopted the census sampling technique, whereby the entire population was used for the study.

The instrument used for data collection was a structured questionnaire titled Artificial Intelligence and Business Education Content Delivery Questionnaire (AIBECDQ). The instrument was subjected to face and content validity by three experts: two in Business Education, one in Educational Foundation Studies, University of Calabar. Their observations and recommendations were incorporated before the final administration of the instrument. A pilot study was conducted using 10 Business educators in university Uyo.

The data obtained were analyzed using Cronbach Alpha reliability technique which yielded an overall reliability coefficient of .86. The researcher personally administered the questionnaire to the respondents with the assistance of two trained research assistants. This ensured 100% retrieval rate and enabled clarification of issues where necessary. Completed copies of the questionnaire were collected immediately after completion or within an agreed period. Simple linear regression was used to test the hypotheses at 0.05 level of significance.

Results and discussions

Research questions one

To what extent does generative AI influence Business education content delivery in public universities in Calabar, Cross River State? Regression analysis was used to answer the research question. The result is presented on Table 1.

Table 3: Simple linear regression of generative AI and Business education content delivery in public universities in Calabar, Cross River State, N=63

R	R. Square	Adjusted R.Square	Std error of estimate
.772	.596	.595	.405

Source: Researcher (2026)

The result as presented on Table 1 reveals that the R which is the correlation coefficient of the independent and dependent variables was .772 indicating a strong positive influence of

generative AI on Business education content delivery. More so, the coefficient of determination (R^2) which indicated how much of the total variation in the dependent variable that can be explained by the independent variable was .596. This showed that 59.6% of variation in the Business education content delivery was accounted for by generative AI. This result however indicated a liner fit between the dependent and independent variables.

Research question two

To what extent does AI-powered learning management system influence Business education content delivery in public universities in Calabar, Cross River State? Regression analysis was used to answer the research question. The result is presented on Table 2.

Table 2: Simple linear regression of AI-powered learning management system and Business education content delivery in public universities in Calabar, Cross River State, N=63

R	R. Square	Adjusted R.Square	Std error of estimate
.751	.585	.584	.395

Researcher (2026)

The result as presented on Table 2 reveals that the R which is the correlation coefficient of the independent and dependent variables was .751 which was a value far greater than .40 indicating a strong positive influence of AI-powered learning management system on Business education content delivery. More so, the coefficient of determination (R^2) which indicated how much of the total variation in the dependent variable that can be explained by the independent variable was .585. This showed that 58.5% of variation in Business education content delivery was accounted for by AI-powered learning management system. This result however indicated a liner fit between the dependent and independent variables.

Hypothesis one

There is no significant influence of generative AI on business education content delivery in public universities in Cross River State. Regression analysis was used to answer the research question. The result is presented on Table 3.

Table 2: Simple linear regression of generative AI and Business education content delivery in public universities in Calabar, Cross River State, N=63

Model	Sum of square	Df	Mean Square	F-value	P-value
Regression	83.450	1	83.450	508.263	.000
Residual	56.480	61	.164		
Total	139.931	62			

Source: Fieldwork, (2026)

A close look at the Table reveals an Analysis of Variance result of F-value = 508.263 with a P-value of .000 at 1 and 61 degrees of freedom. The F-value which was greater than 1 yielded efficient model. Also, since the P-value of .000 was less than the tolerable significance value of .05, it therefore indicated that the regression model significantly predicted the outcome variable. Thus, the null hypothesis was rejected and the alternative hypothesis was accepted. This implies that there is a significant influence of generative AI on business education content delivery in public universities in Cross River State.

Hypothesis two

There is no significant influence of AI-powered learning management system on business education content delivery in public universities in Cross River State. Regression analysis was used to answer the research question. The result is presented on Table 4.

Table 4: Simple linear regression of AI-powered learning management system and Business education content delivery in public universities in Calabar, Cross River State, N=63

Model	Sum of square	Df	Mean Square	F-value	P-value
Regression	93.450	1	93.450	518.263	.000
Residual	46.480	61	.154		
Total	139.931	62			

Source: Fieldwork, (2026)

A cursory look at the Table reveals an Analysis of Variance result of $F\text{-value} = 518.263$ with a $P\text{-value}$ of .000 at 1 and 61 degrees of freedom. The $F\text{-value}$ which was greater than 1 yielded efficient model. Also, since the $P\text{-value}$ of .000 was less than the tolerable significance value of .05, it therefore indicated that the regression model significantly predicted the outcome variable. Thus, the null hypothesis was rejected and the alternative hypothesis was accepted. This implies that there is a significant influence of AI-powered learning management system on business education content delivery in public universities in Cross River State.

Discussion of findings

The findings of the study revealed that generative AI has a significant positive influence on Business education content delivery in public universities in Cross River State. This implies that Business educators who possess the ability to develop clear, precise, and context-specific prompts for artificial intelligence applications are better able to prepare lesson notes, generate instructional materials, develop assessment tasks, and organize classroom activities effectively. The effective use of prompt engineering enables educators to obtain relevant and curriculum-aligned outputs from AI tools, thereby enhancing the quality and efficiency of instructional delivery.

This finding agrees with Aydın and Karaarslan (2023) that generative AI has become a critical competency for educators because it improves the quality of AI-generated educational content and supports innovative teaching practices. The finding is also consistent with Feuerriegel et al. (2023), that educators with generative AI competencies utilize generative AI more effectively in lesson planning, assessment design, and personalized learning. This finding supports the work of Surugiu et al. (2024) that generative AI improves instructional design by assisting educators in creating interactive and engaging learning resources. Similarly, Agadagba and Ekwavugbe, (2025) that generative AI applications have transformed content development in higher education by enabling educators to produce quality educational materials with greater efficiency and accuracy.

The findings also suggest that AI-powered learning management system significantly influence Business education content delivery in public universities in Cross River State. Educators

equipped with AI competencies are better positioned to integrate technology into classroom instruction, provide timely feedback, personalize learning experiences, and promote students' active participation in learning. This finding corroborates the position of Ellikkal and Rajamohan (2025) that AI-powered learning management system serves as an effective instructional partner capable of enhancing teaching quality, learner engagement, and educational outcomes when educators possess the necessary digital competencies. Likewise, Chen et al. (2022) emphasized that AI-powered learning management system has become an important educational innovation capable of improving instructional delivery, curriculum implementation, and learning support across higher education institutions.

Conclusion

Artificial intelligence has become a transformative force in higher education, offering innovative opportunities to improve teaching and learning. This study established that artificial intelligence plays a significant role in enhancing Business educators' content delivery. These competencies enable educators to prepare high-quality instructional materials, deliver lessons more effectively, engage students actively, and improve the overall teaching and learning process. The study therefore concludes that continuous acquisition and effective utilization of artificial intelligence skills are essential for improving instructional effectiveness and ensuring that Business Education remains relevant in the digital era. Consequently, universities should prioritize capacity building, technological support, and the integration of AI into teaching practices. This would help to equip business educators with the competencies needed to deliver quality education and prepare students for the demands of the modern business environment.

Recommendations

Based on the findings of the study, the following recommendations are made:

- i. University management should organize regular training programmes, workshops, and professional development sessions on generative AI to equip Business educators with the

competencies required to effectively integrate artificial intelligence tools into lesson preparation, instructional material development, classroom delivery, and assessment.

- ii. University management should invest in adequate digital infrastructure and provide institutional support for the adoption of AI-powered learning management system by ensuring access to reliable internet connectivity, AI-enabled educational software, digital learning platforms, and relevant ICT facilities. This will enhance Business education content delivery and improve the quality of teaching and learning in Business Education programmes.
- iii. Lecturers should be trained on the use of generative AI to enhance their skill in content delivery.
- iv. Lecturers should adopt the use of AI-powered learning system to enhance content delivery.

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